

EUROPEAN JOURNAL OF PHYSICAL AND REHABILITATION MEDICINE

MEDITERRANEAN JOURNAL OF PHYSICAL AND REHABILITATION MEDICINE
formerly EUROPA MEDICOPHYSICA

Vol. 46

June 2010

Suppl. 1 to issue No. 2

C O N T E N T S

- 1** 0001 - About the role of neuropsychologist at an early stage of neurorehabilitation - N. A. Varako, I. S. Kulikova, V. D. Daminov
- 1** 0002 - The usage of VocaStim device in rehabilitation of the patients with dysphagy and dysphonia - A. Obukhovskaya
- 1** 0003 - Rehabilitation robotics of patients in intermediate period of spinal cord trauma - N. V. Rybalko, I. G. Gorochova, E. V. Zimina, V. D. Daminov
- 2** 0004 - Central and cerebral blood flow estimation of patients in acute stroke applying tilt-table Erigo - V.D. Daminov, N.V. Rybalko, A.N. Kuznetsov
- 2** 0005 - Low-energy extracorporeal shock wave therapy as a treatment for medial tibia stress syndrome - J.D. Rompe, A. Cacchio, J.P. Furia, N. Maffulli
- 2** 0006 - Home training, local corticosteroid injection or radial shockwave therapy for greater trochanter pain syndrome - J.D. Rompe, N. A. Segal A. Cacchio, J. P. Furia, N. Maffulli
- 2** 0007 - Eccentric loading versus eccentric loading plus shock wave treatment for mid-portion Achilles tendinopathy: a randomized controlled trial - J. D. Rompe, J. Furia, N. Maffulli
- 3** 0008 - New rehabilitation technology for patients with motor coordination disorders - E.V. Zimina, E.V. Bugorsky, V.D. Daminov
- 3** 0009 - One support and care getting better quality of his life - C. Mirabelli, P. Casanova, G. Valdenassi
- 3** 0010 - The rehabilitation protocol for bone stress injury of the talus - N. Albayrak Aydin, K. Yazicioglu
- 4** 0011 - Application of kinesio taping on the patients with leg paresis and recurvatum after acute ischemic insult - L. Nikčević, A. Plavšić, N. Mujović, M. Hrklović, Z. Brdareski, L. Konstantinović, J. Vasić
- 4** 0012 - Evaluation of motor development for cerebral palsy (CP) by use of the Gross Motor Function Measure (GMFM) and the Pediatric - H. Takahashi, Y. Okajima
- 4** 0013 - How to fight diabetic depression - S. Zeqiri, N. Zeqiri, N. Shala, A. Ylli, A. Bakalli
- 5** 0014 - Plantar Fascia-Specific Stretching *versus* Radial Shock Wave Therapy as Initial Treatment of Plantar Fasciopathy - J. D. Rompe, A. Cacchio, L. Weil, J. P. Furia, J. Haist, V. Reiners, C. Schmitz, N. Maffulli
- 5** 0015 - Do services that respond to perceived needs allow people to take up their lives where they left off? - H. Lefebvre, J. M. Mazaux, T. Sarraf, J. J. Weiss, P. Azouvi
- 6** 0016 - Application of kinesio taping on the patients with leg paresis and recurvatum after acute ischemic stroke - L. Nikčević, A. Plavšić, N. Mujović, M. Hrklović, Z. Brdareski, L. Konstantinović, J. Vasić
- 6** 0017 - Quality of life after total hip replacement - M. Spalevic, L. Dimitrijevic, M. Kocic, I. Stankovic, B. Cvetkovic, M. Mandic
- 7** 0018 - Rehabilitation program after total hip and knee replacement - M. Spalevic, L. Dimitrijevic, M. Kocic, I. Stankovic, B. Cvetkovic, M. Mandic
- 7** 0019 - Evidence based Standards for Rehabilitative Therapy: Improvement of Process Quality Through Performance Indicators - S. Brueggemann, R. Buschmann-Steinhage
- 7** 0020 - Can we predict physical and mental health? - N. Zdanowicz, B. Lepiece, D. Tordeurs, D. Jacques, C. Messaud, V. Thomas, D. Bohy, C. H. Reynaert, J. Tecco, P. Janne
- 8** 0022 - Efficacy of substitutive treatment in 18 patients with traumatic brain injury and GH deficit - O. Kozlowski, C. Cortet-Rudelli, W. Daveluy, P. Fontaine, M. Rousseaux
- 8** 0023 - Neutral functional realignment orthosis prevents hand pain in patients with subacute stroke: a randomized trial - Bürge E, Kupper D, Finckh A, Ryerson S, Schneider A, Leemann B.
- 9** 0024 - The modern technologies of restorative medicine and rehabilitation of patients with acute infringements of cerebral blood circulation - N. Sichinava, E. Ivanova, T. Ibragimov

- 9 0025 - The modern technologies of restorative medicine in the complex correction of the functional reserves of the organism at the persons with risk of the arterial hypertension development - I. Ekaterina
- 9 0026 - Clinical Observation on Effect of Clearing the Governor Vessel and Refreshing the Mind Needling on Head SPECI and CT Scanning of children with Cerebral Palsy - Z. Liu Nanhai
- 10 0027 - The Clinical Study of The Curative Effect of Childhood Autism Treated By Head Acupuncture - Z. Liu Nanhai
- 10 0028 - Treatment of Cerebral Palsy with Speech Disorder By Linguistic Training and Acupuncture - Z. Liu Nanhai
- 10 0029 - Electromagnetic radiation of the vegetative centers - A.E. Bessonov, E.A. Kalmykova
- 12 0030 - Principles and new technologies of rehabilitation in stroke - Chernikova L.A.
- 12 0031 - The efficacy of group communication treatment with aphasia: one local experience - C. Mirabelli, C. Cavigliola
- 12 0032 - Morbo di Parkinson: Evaluation FIM and UPDRS before and after treatment riabilitativo for a long time term - A.M. Rivignani Vaccari, A. Spiezia, G. Ferraro, C. Esposito, F. Gimigliano, A. Riccardo, M. Rocco, A. Giugliano
- 13 0034 - Therapeutic modalities of rehabilitation in the treatment of non-surgical temporomandibular joint disorders - S. Pimentel, T. Toste
- 14 0039 - Recovery of functional status following stroke in a tri-ethnic population - I. M. Berges
- 15 0040 - Evaluation of Pure Tone Audiometric (250-16000 Hz) in Middle-Aged Subjects with Type 2 Diabetes Mellitus - R. Zeinolabedini, B. Forogh, M. Akbari
- 15 0041 - Impact of neuromuscular assessment in rehabilitation program at patients with multiple sclerosis - L. Rusu, M. Dragomir
- 16 0042 - Evidence based approach to the management and rehabilitation of osteoarthritis - E. Ilieva
- 16 0043 - Effects of postural balance training on dynamic stability scores in neuropathic patients with type 2 diabetes - H. Salsabili, F. Bahrpeyma, B. Forugh, S. Rajabali
- 17 0044 - Observational study about vertebral fractures in patients with hip fractures by fragility - A. Reda, M. G. Bartoletti
- 17 0045 - Understanding the epidemiology of human functioning using graphical models - Markus Kalisch, Eva Grill, Bernd Fellinghauer, Marloes H. Maathuis, Ulrich Mansmann, Peter Bühlmann, Gerold Stucki
- 17 0046 - Musculoskeletal ultrasonography in physical and rehabilitation medicine: Results of the First World-wide Survey Study - L. Özçakar
- 18 0048 - The taking charge of the disabled injured workers : ICF as an assessment instrument of needs and abilities INAIL's ICF Study Group - V. Gallo, G. Ali, V. Castaldo, A. Feragnoli, M. Gabrielli, F. Luisi, M. R. Matarrese, D. Nicita, P. Scelfo
- 18 0049 - Epidemiological comparative study of the hemispheric stroke between Kunming and Limoges - Z. Zhou, J. C. Daviet, J. Y. Salle, B. Marin
- 18 0050 - Ultrasound guided interventional procedures: the percutaneous treatment of calcifying tendinitis of rotator cuff tendons - L. Di Lorenzo, A. M. Forte, C. Foti
- 19 0051 - Combination intrathecal therapy for simultaneous management of intractable pain and spasticity - M. Saulino
- 19 0052 - Interrater reliability of Functional Independence Measure aggregate scores and sub scores in a clinical setting - F. Kohler, H. Redmond, H. Dickson
- 20 0053 - Health awareness in disabled persons – a multi-center survey on lower limb amputees - P. Tederko, I. Kordowicz, M. Fronczek, K. Gworys, J. Kujawa, E. Iuczak, K. Szulkowska, K. Wasiak, D. Wosiakowska, M. Krasuski
- 20 0054 - Health awareness in disabled persons – a preliminary survey on persons after spinal cord injury - P. Tederko, H. Limanowska, M. Krasuski
- 21 0055 - Clinical and neurophysiologic evaluation of neurogenic lesions and physical therapy of children with spinal dysraphism - I. Petronic, D. Cirovic, T. Knezevic, D. Nikolic, D. Dzamic, R. Brdar, M. Raicevic
- 21 0057 - Extracorporeal shock wave therapy application to 60 patients with diagnosis plantar phascitis and calcaneal spur - N. Korchazhkina, A. Rubamchenko
- 21 0058 - Gait robot for the repetitive practice of floor walking and stair ascending and descending in nonambulatory patients - A. Waldner, C. Werner, C. Tomelleri, S. Hesse
- 22 0059 - Interest of a multidisciplinary consultation of diabetic foot - J. Hamonet, C. Verdíé-Kessler, J.C. Daviet, E. Denes, C.L. NGuyen-Hoang, J.Y. Salle, M. Munoz
- 22 0060 - Physical factors associated with post-stroke fatigue - C. L. Nguyen Hoang, F. Macian, J. Hamonet, A. Stuit, J. Y. Salle, J.C. Daviet
- 22 0061 - The prevention of the hip ri-fracture: suggest of a correct therapeutic pathway - M. G. Bartoletti
- 22 0062 - Sacral nerve modulation in the treatment of bladder symptoms due to multiple sclerosis - E. Andretta, E. Ostardo, L. Limido, C. Campo, C. Simeone, D. Signorello, M. Pastorello
- 23 0063 - Census of the spinal cord injuries in a district of the north-east of Italy - E. Andretta, F. Laganà, C. Zulliani, D. Primon, S. Buoso,
- 24 0064 - Asymmetry of external rotation-abduction-flexion and of internal rotation-adduction-extension of glenohumeral joint - S. Orzes, P. Ranaudo, P. Siragna, S. Prade, F. Rizzo, M. Ambrosone, R. A. Sergi, F. Festa
- 24 0065 - Manual treatment of knee osteoarthrosis - S. Orzes, M. Calasso, G. De Sena, A. Sergi Rocco
- 25 0066 - Asymmetric rotation of cervical spine evaluated with cervical measurement system (C.M.S.) - S. Orzes, G. Dalla Corte, F. Festa, G. De Sena, E. Viva
- 25 0067 - Rehabilitation patients with acute stroke: walk in a park or jumping over barriers? - K. Lyadov, T. Shapovalenko, I. Sidiyakina, T. Isaeva, N. Lovzevitch, M. Makarova
- 25 0068 - Physical therapy after anterior arthroscopic bankart repair - Mitrovic D, Diklic I, Bogdanovic D, Miljkovic I
- 26 0069 - Treatment with botulinum toxin in patients with adesive capsulitis preliminary pilot study of the treatment with botulinum toxin in patients with rigidity of shoulder and elbow - G. A. Magagni, G. Porcellini, F. Campi, P. Righetti, T. Di Gregorio, R. Galassi, I. Panzini
- 26 0070 - Physical fitness training and mood - S. Petrovic, S. Totic-Golubovic, D. Gugleta, T. Petrusic

- 27 0071 - Principles and new technologies of rehabilitation in stroke - Chernikova L. A.
- 27 0072 - Effects of the mechanical support stimulation in patients with acute ischemic stroke - Saenko I. V., Chernikova L.A., Kozlovskaya I.B., Kononov R.N., Krotenkova M.V., Melnik K. A.
- 28 0073 - Neurofeedback and network rehabilitation - Guk R. Yu., Jafarova O.A., Sklyar M.M., Chernikova L.A., Tarasevich A.F., Shtark M.B.
- 28 0074 - Rehabilitation following cardiopulmonary transplantation - M. Bowman
- 28 0075 - Anxiety at the patients post-stroke-impediment in rehabilitation program - D. Dimulescu, G. Chiriți, C. Davila
- 29 0000 - Pain and disabilities improvement in old patients with knee OA - a result of the complex rehabilitation program - Gheorghe Chiriți, D.M. Dimulescu, G. Mologhianu
- 29 0076 - Postural therapy in increasing quality of life at the patients with hip OA - D. M. Dimulescu, G. Chiriți, C. Davila
- 30 0077 - Depression-negative factor in improvement the quality of life at the patients post-stroke - G. Chiriți, D. M. Dimulescu, C. Davila
- 30 0078 - Pain and disabilities improvement in old patients with knee OA – a result of the complex rehabilitation program - G. Chiriți, D. M. Dimulescu, G. Mologhianu, C. Davila
- 30 0079 - Clinical effects of stimulation using prosthetic insoles in patients with chronic mechanical low back pathologies: Randomly controlled double-blind trials - S. Orzes, G. Sensi, M. A. Fusco, M. Ambrosone
- 30 0080 - The rehabilitative approach to the muscular recovery of sarcopenic elderly: Review - L. Coppola, L. Guidolin, S. Masiero, A. Giovannini
- 31 0081 - Study about influence of depression in the cognitive recovery process of stroke patients - D. Pircoveanu, V. Tudorica, C. Zaharia, F. Trifan, D. Matcau
- 31 0082 - Safety of Botulinum Toxin Among Patients Receiving Long-term Warfarin Anticoagulation Therapy - Y. Jagatsinh, J. Macfarlane
- 32 0083 - Intrathecal Baclofen: its effect on Symptoms and ADL's in severe spasticity due to Spinal cord injuries - A Pilot study. Y. Jagatsinh
- 32 0084 - Medical rehabilitation and occupational (ergo) therapy - an adjuvant medical specialty under the supervision of prm doctors: the Bulgarian way - I. B. Koleva
- 32 0085 - Neurorehabilitation as a part of the physical and rehabilitation medicine: the Bulgarian tradition - I. B. Koleva
- 32 0086 - Valproate-induced lower extremity edema - N. A. Aydin, T. Yanik, K. Yazicioglu
- 33 0087 - The management of school screening program for spine deformity with spine mouse device - E. Popova Ramova, M. Lazovic, A. Poposka
- 33 0088 - The factors influencing the functional state recovery in cerebral stroke patents during inpatient rehabilitation - E. Milinavičienė, D. Rastenytė, A. Kriščiūnas
- 34 0089 - Effects of integrated care after primary implantation of hip and knee endoprosthesis - U.C. Smolenski, W.D. Müller, P. Bak, S. Heinle, U. Irlenbusch
- 34 0090 - The mirror therapy in the rehabilitation of lower limb amputation: is there any contraindication? - C. Damiani, R. Casale, V. Rosati
- 34 0091 - Non-specific chronic low back pain patients are deconditioned and have an increased body fat percentage - L. Carroll
- 34 0092 - Orthosis management in patients with poliomyelitis - B. Bocker, C. Hölig, U. C. Smolenski
- 35 0093 - The impact of body image disturbance on rehabilitation program in lower limb amputees: a pilot study
- 35 0094 - Isokinetic measurement of lower limb distal muscle strength and endurance, before and after a rehabilitation programme for patients with chronic arterial occlusive disease - A. Cousin, S. Popielarz, C. Bouron, C. Mounier-Vehier, A. Thevenon
- 35 0095 - Effectiveness of hallux valgus strap, a prospective, randomized single-blinded controlled trial - C. Chueluecha, N. Chadchavalpanichaya
- 36 0097 - Dietary intakes in people with chronic spinal cord injury: An analysis by obesity and injury related variables - H. Sabour, A. Norouzia Javidan, M. Reza Vafa, F. Shidfar, H. Saberi, A. Rahimi, H. Emami Razavi
- 36 0099 - Sympathetic Skin Response in Rheumatoid Arthritis - M. J. Hadianfard, A. R. Ashraf, M. R. Emad, A. Tajziehchi, M. A. Nazarinia
- 36 0100 - Diagnostic and therapeutic concepts in cmd from the aspect of manual medicine - U. C. Smolenski, B. Bocker, R. Bocker
- 36 0101 - Muscular backgrounds of motion control - U. C. Smolenski, B. Bocker, A. Reuter, N. Schwarz
- 37 0103 - Static stabilometry in the evaluation of the correlation and significance of different variables: length of the track, area subtended, age, height, weight and foot length - R. Schiffer, F. Scoppa
- 37 0104 - Investigation of the relationship between osteoporosis and sexual satisfaction in women - A. Ashraf, B. Kazemi, M. Musavinasab, P. Sedaghat, S. Dayaghi
- 37 0106 - Behavioural deficits following traumatic brain injury - M. Lippert-Grüner
- 37 0108 - Comparison of Padua Inventory score between the patients with carpal tunnel syndrome and general population - S. Dayaghi, A. Ashraf, A. Ghanizadeh, M. H. Ashraf
- 38 0109 - Evaluation of the bone density of the femur in the patients with unilateral knee osteoarthritis - A. Ashraf, N. Azhdarnia, M. J. Hadianfard, M. R. Emad, S. Roshanzamir
- 38 0110 - Life quality related management possibilities of metastatic bone fractures diagnosis and therapy - D. Nemes, D. V. Poenaru, O. Drira, M. Dragoi, E. Amaricai, D. Popa, L. Catan, D. Surducan, H. Vermesan, D. Vermesan, R. Prejbeanu, O. Suci, R. Onofrei, C. Milicin, G. Puenea, C. Galai, C. Mateas, C. Gruin
- 38 0111 - Research regarding the quality of life in patients with surgically treated osteoarthritis - D. Nemes, D. V. Poenaru, O. Drira, M. Dragoi, E. Amaricai, D. Popa, L. Catan, D. Surducan, H. Vermesan, D. Vermesan, R. Prejbeanu, O. Suci, R. Onofrei, C. Milicin, G. Puenea, C. Galai, C. Mateas, C. Gruin
- 38 0112 - Complex assessment and therapies of the secondary scoliosis in inflammatory rheumatic diseases - D. Nemes, D. V. Poenaru, M. Dragoi, D. Popa, E. Amaricai, L. Catan, D. Surducan, O. Suci, R. Onofrei, D. Andrei, G. Puenea, C. Mateas, C. Galai, C. Gruin, O. Cretu
- 39 0113 - Sexuality rehabilitation on a spinal cord injury Portuguese population - A. Garrett, F. Martins, Z. Teixeira
- 39 0115 - The weight bearing paraplegic arm - Y. Dionyssiotis, G. Lyriris, M. Georganas, D. Stavrianakis, P. Papaioannou

- 39 0116 - The association of physical activity and calcium intake with bone parameters - Y. Dionyssiotis, I. Paspati, G. Trovas, P. Papaioannou, G. Lyritis
- 40 0117 - Sympathetic Skin Response in Reynaud's phenomenon - M. R. Emad, M. G. Tayebi, M. A. Nazarinia, M. J. Hadianfard, A. R. Ashraf
- 40 0118 - 'reatment of spasticity and functional Outcome after Botulinum toxin a (Botox®) injection in patients with neurologic lesions - Y. Dionyssiotis, D. Kiourtidis, A. Karvouni, A. Kaliontzoglou, I. Kliafas
- 40 0119 - Massotherapy in active first stage of labour - P. Tessari, A. Scognamiglio
- 41 0120 - Spasticity Management "the latest developments in specific disorders - Zoi P. Dalivigka
- 41 0121 - Virtual reality and motor rehabilitation of the upper extremity in the first year after stroke - P. Kiper, A. Turolla, L. Piron, M. Agostini, L. Cocco, A. Vendramin, S. Rossi, A. Baba, P. Tonin
- 41 0122 - Audit of Medical Record Keeping - N. Memon, R. Hanspal
- 41 0123 - Survey on the sexuality of para-tetraplegic women - E. Andretta, C. Zuliani, E. Cossaro, L. Spolaore, S. Buoso
- 42 0124 - The protective role of endurance exercise training against oxidative damage in the brain of rats with induced diabetes - M. Al-Jarrah, M. Jamous, Y. Al Hamadi, A. Al-Khateeb
- 42 0125 - Assessment of disability in obese patients - P. Capodaglio, A. Brunani, G. Spera, L. M. Donini
- 42 0126 - A complex case of pituitary apoplexy - N. Memon, R. Hanspal
- 42 0127 - Treatment of patients with fibromyalgia syndrome with vibration massage by deep oscillations - K. Kraft, S. Kanter, H. Janik
- 43 0128 - Superimposed neuromuscular electrical stimulation to recover range of motion at the hand - M. Boisgontier, V. Nougier
- 43 0129 - Superimposed Neuromuscular Electrical Stimulation Effects on Maximal Voluntary Contraction - M. Boisgontier, M. Emprin, N. Vuillerme, M. D. Iversen
- 43 0130 - Effects of Electrical Stimulation Superimposed to Voluntary Muscular Contraction on Muscular Endurance - M. Boisgontier, B. Moineau, R. Cuisinier, N. Pinsault, V. Nougier
- 43 0131 - Audit of discharge reports following Traumatic Brain Injury - R. Hanspal, T. Abdul-Wahab
- 44 0132 - Audit on the use of antiepileptic drugs following traumatic brain injury - I. Hai, Hanspal
- 44 0133 - The international classification of functioning, disability and health (ICF) in vocational rehabilitation and disability assessment in Slovenia - P. Ptyushkin, G. Vidmar, H. Burger, Č. Marinček
- 44 0134 - Evaluation of the effects of selective rehabilitation on the patients with chronic low back pain - M.A. Shakoor, A. K. M. Salek, M. Tariqul Islam, M.D. Moyeenuzzaman
- 44 0135 - Rehabilitation after anterior cruciate ligament reconstruction related to graft choice - M. Bacchini, C. Rovacchi, M. Rossi
- 45 0136 - Nerve block in the management of the upper motoneurone syndrome. Result of musculocutaneous Neurolysis with Phenol - F. Medina Estévez, J. Sanchez Enriquez, M. E. Santandreu Jimenez, L. Méndez Suarez, G. Miranda Calderín
- 45 0137 - Responsive technology in rehabilitation of children with cochlear implant - A. Rega, M. Caretti
- 45 0138 - Detrusorial injections of Botulinum Toxin in overactive bladder due to multiple sclerosis: 10 year experience - E. Andretta, C. Zuliani, E. Cossaro, C. Fattorello, G. Artuso
- 45 0139 - Osteoporosis in patients with multiple sclerosis: proposed therapeutic and diagnostic protocol - Y. Dionyssiotis, P. Papaioannou, G. Lyritis, D. Kiourtidis, A. Karvouni, I. Kliafas
- 46 0140 - Greek guidelines of Hellenic institution of osteoporosis with respect to the exercise of osteoporosis and falls - Y. Dionyssiotis on behalf of Hellenic Institution of Osteoporosis (HELIOS)
- 46 0141 - Study of spinal Orthosis in postmenopausal women - Y. Dionyssiotis, G. Michas, A. Galanos, G. Trovas, G. P. Lyritis
- 46 0142 - Review of rehabilitation practice in a specialist inpatient setting - R. Hanspal, I. Hai
- 46 0143 - The use of serum biomarkers to predict outcome following mild traumatic brain injury - A. Michalak, J. Topolovec-Vranic, M. A. Pollmann-Mudryj, D. Ouchterlony, A. Romaschin, C. Masanic, D. Klein, J. Spence, A. Baker
- 47 0144 - Quality of life and physical activity after total knee replacement - F. Januário, J. Páscoa Pinheiro, F. Fonseca
- 47 0145 - The effect of Botulinum Toxin on cervical dystonia - I. Stankovic, J. Stamenovic, L. Dimitrijevic, H. Colovic
- 47 0146 - The Effect of Calf Stretching Box in Stretching Calf Muscle Compliance: A Prospective, Randomized Single-Blinded Controlled Trial - N. Chadchavalpanichaya, Gulapar Srisawasdi, Atchara Suwannakin
- 47 0147 - Tenderness of the neck muscles predicts future pain of young adults – a 6-year follow-up of adolescents with and without headache - K. Laimi, J. Pitkänen, T. Vahlberg, L. Metsähonkala, J. J. Salminen
- 48 0148 - Spinal Cord Injuries: a new motor rehabilitation approach - R. Albertazzi, C.A. Arcangeli, M. Morandi, G. Lazzeri
- 48 0149 - Assessment of the effects of application of radio-frequency 0. 485 MHz by using capacitive - resistive system in the muscle tissues through crossover double blind study - M. Tofanicchio, C. Tranquilli, G. Annino, M. Hawamdeh, G. Della Bella, B. Contini, P. Broccoli, S. Ceccarelli, E. Fanucci, S. D'Ottavio, Bernardini C. Foti
- 48 0150 - Gait pattern in patients with central cord syndrome - A.G. Agudoa, A. Forner-Cordero, E. Pérez-Rizo, S. Pérez-Nombela, B. Crespo-Ruiz, A. del Ama-Espinosa, C. de Miguel-Benadiba
- 48 0151 - Effects of Selective Rehabilitation in Cervical Spondylosis- a Clinical Trial - A. Shakoor, S. Rahman
- 49 0152 - Toward the development of new rehabilitation strategies: Bilateral Transfer of motor skill learning in stroke patients - C. D. Ausenda, M. Carnovali
- 49 0153 - Prevention of synkinesis by biofeedback therapy - A. Pourmomeny, H. Zadmeher, M. Meirshamsi
- 49 0154 - Comparison between magnetotherapy and diclofenac sodium in chronic low back pain - B. Marjanovic
- 49 0155 - Evaluation of the coefficient of correlation and of meaningfulness between dependent and independent variables in the analisis of step through electronic baropodometry..... - R. Schiffer, F. Scoppa

- 50 0156 - Comparison between Chin tuck exercise and stabilizer exercises on the Forward head posture correction - A.H. Bakhtiary, R. Mohammadi, B. Panahande, S. Fatemeh Mir-Hojati
- 50 0157 - Dynamic splinting of the non-functional spastic upper limb in stroke, a case report - J. W. G. Meijer
- 50 0158 - Epidemiology of associated conditions in children with cerebral palsy in Kosova - I. Dallku, H. H. Hysenaj, I. Blakaj, A. Murtezani
- 50 0159 - Predictive factors of Future Rehabilitation Need - M. Saltychev, K. Laimi, T. Oksanen, J. Pentti, J. Vahtera
- 51 0160 - Social functioning and self-esteem in young people with disabilities participating in adapted competitive sport - M. Dinomais, G. Gambart, A. Bruneau, L. Bontoux, X. Deries, C. Tessiot, I. Richard
- 51 0161 - Efficacy of low-level laser therapy and transcutaneous electrical nerve stimulation therapy on range of motion in chronic low-back pain - S. Grazio, B. Markulinčić, S. Muraja, F. Grubišić, T. Nemčić, V. Matijević, H. Skala Kavanagh, V. Šušak
- 51 0162 - Manual mechanic coccydynia treatment - R. Gatto, M. L. Tenaglia
- 51 0163 - The study of triaxial torque output and electromyography activity of selected trunk muscles during generation of pure and combined exertions in upright standing in asymptomatic..... - G. R. Olyaci, S. J. Mousavi, S. Talebian, M. Parnianpour
- 52 0164 - Changes In Locomotory Functioning After Repetitive Locomotor Training In Patients Affected By Cerebral Palsy - D. Munari, P. Bonetti, A. Cosentino, A. Waldner, S. Hesse, C. Geroin, C. Werner, M. Gandolfi, N. Smania
- 52 0165 - Effects of sensory-motor integration training on balance impairment in patients with multiple sclerosis - D. Munari, E. Ceriani, C. Fontana, M. Casarotto, M. Benedetti, A. Fiaschi, M. Gandolfi, N. Smania
- 52 0166 - Prediction of outcome of low back pain intervention by 3 objective measures - A. Karimi, B. Richardson
- 53 0167 - Acupuncture in subjects affected by acute neck and brachialgia pain related to cervical spinal disc herniation or protrusion, with or without spinal stenosis..... - R. Gatto, M. L. Tenaglia
- 53 0168 - Ergonomic chair: spatial exploration in cervical and dorso-lumbar spinal cord injury patients - M. Saccavini, S. Odelli, F. Lauretani, C. Foti, M. Franceschini
- 53 0169 - Balance and mortality in older persons - F. Lauretani, M. Maggio, S. Bandinelli, L. Ferrucci, G.P. Ceda, M. Saccavini
- 53 0170 - Gonadal status and physical performance in older men - F. Lauretani, M. Maggio, S. Bandinelli, L. Ferrucci, G. P. Ceda, M. Saccavini
- 54 0171 - Efficacy of Botulinum toxin injection with and without electromyography assistance for the treatment of spasticity - D. Varvarousis, A. Ploumis, A. Beris
- 54 0172 - Response to different modalities in patients with fibromyalgia (FM) - A. C. Bighea, S. Patru, R. Marcu, R. Popescu
- 54 0173 - Complex regional pain syndrome due to Herpes Zoster - Z. Ozeri, B. D. Cakit, M. Sengul, S. Taskın, H. R. Erdem
- 54 0175 - Early Rehabilitation After Vukov's Technique With Cromioclavicular Injuries In Young Athletes - T. Radovanovic, V. Vukov, M. Manojlovic-Opacic, E. Dubljanin, V. Vesovic-Potic, M. Zdravkovic
- 55 0176 - The effect of video-guidance on active and passive movement as assessed by fMRI: useful for rehabilitation? - M. Dinomais, A. Ter Minassian, S. Groeschelb, M. Deliond, T. Tuiliere, S. N'Guyenf, C. Aubée, I. Richarda
- 55 0177 - Application of robots in rehabilitation: successes and expectations - G. Fazekas, Z. Denes, E. Boros, M. Trocsanyi, K. Zsiga, P. Orsolya
- 55 0178 - Pressure exerted in the peroneal nerve pending on the different positions in the ICU bed - K. Grigoriadis, I. Efstathiou, I. Petrianos, A. Armaganidis, G.I. Vasileiadis
- 56 0179 - Body mass index and quality of life of patients before and after hip arthroplasty because of osteoarthritis - S. Dj. Jandric, R. Sukalo, Z. Jovicic, S. Popeskov, S. Grubiša
- 56 0180 - Randomized controlled trial of land based and water exercises program in patients with hip osteoarthritis - S. Patru, A.C. Bighea, I.R. Marcu, R. Popescu
- 56 0181 - Incidence of ulnar-to-median nerve motor fiber anastomosis (Riche-Cannieu anastomosis) in hand - T. Ahadi, G. Reza Raissi
- 56 0182 - Shoulder instability in infantile spastic cerebral palsy (ISCP) treated with head humeral prosthesis: a case report - P. Bertocco, G. Giaffreda, S. Marzorati, D. Clementi
- 57 0183 - Tough discharges of patients affected by severe acquired brain lesion - G. P. Salvi, A. M. Quarenghi, L. Manzoni, L. Smirni, C. Valiante, L. Valsecchi
- 57 0184 - Pre-operative pulmonary training program in coronary artery bypass graft surgery patients at Siriraj hospital - W. Thirapatarapong, N. Chumwong
- 57 0185 - Progression and explanatory factors of nutritional status in the few years' post-stroke - J. Paquereau, M. Romon, E. Allard, W. Daveluy, M. Rousseaux
- 57 0186 - Pain – disfunction ecuation to stroke survivors - A. Murgu, A. Nica, G. Mologhianu, C. Brailescu, B. Mitoiu, M. Ivascu
- 58 0187 - A bridge between a systemic approach and an ontogenetic approach for a -sailed- rehabilitation in seven situations of different tetraplegia - U. Incasa, P. Gabusi
- 58 0188 - Functional restoration in chronic low back pain Tunisian experience - W. Herchi, W. Sarraj, A. Souayah, H. Rahali-Khachlouf, I. Miri, S. Ghorbel, S. Lebib, F. Z. Ben Salah, C. Dziri
- 58 0189 - Management of knee osteoarthritis in physical and rehabilitation medicine in the elderly population - W. Herchi, Z. Saoud, A. Souayah, H. Rahali-Khachlouf, I. Miri, S. Ghorbel, S. Lebib, F. Z. Ben Salah, C. Dziri
- 59 0190 - Diagnostic Value of F-wave Latency in Alcoholic Polyneuropathy - H. Azadeh, E. Aul, J. Kimura
- 59 0191 - Work related low back pain among Kosovo power plant workers - A. Murtezani, C. Bytyci, H. Hundozi, M. Berisha
- 59 0193 - Case report: amyotrophic lateral sclerosis patient presenting with radiculopathy and polyneuropathy - K. Alptekin, V. Ozden, D. Diracoğlu
- 59 0194 - Acoustic voice analysis in patients with subcortical aphasia - M. Vukovic, M. Pterovic-Lazic
- 60 0195 - The effectiveness of Mirror Therapy for preventive and therapeutic Phantom Limb Pain treatment: a case control study on 4 amputees patients - C. Laurentaci, G. Guida, V. Pietragalla, M. R. Lisanti, L. Dicandia, M. Ranieri, G. Megna

- 60 0196 - Home based computer assisted upper limb exercise for young children with cerebral palsy: A feasibility study investigating impact on motor control and functional outcome - B. B. Bhakta, A. Weightman, N. Preston, R. Holt, M. Mon Williams, M. Clarke, J. A. Cozens, M. C. Levesley
- 60 0197 - Feasibility of using a dual rehabilitation robotic system (iPAM) to improve quality of voluntary upper limb movement in people with stroke..... - B. B. Bhakta, A. J. Jackson, P. Culmer, S. Makower, J. Savage, M. Mon Williams, M. C. Levesley, J. A. Cozens
- 60 0198 - Saphenous nerve entrapment at the PES anserine bursa: A possible etiology for persistent symptoms in patients with knee osteoarthritis - H.A. Sultan, G.A. El-tantawi
- 61 0199 - Is low level laser therapy effective in acute or chronic low back pain? - A. Y. Saime AY, S. Koldas Dogan, D. Evcik
- 61 0200 - Efficacy of different therapy regimens of low level laser in low back pain - A. Y. Saime AY, S. Koldas Dogan, D. Evcik
- 61 0201 - The effectiveness of portable audio biofeedback device in myofascial pain syndrome - S. Ay, S. Koldas Dogan, D. Evcik
- 61 0202 - The significance of balneophysical treatment in children operated on for legg-calve-perthes' disease (LCPD) - J. Milovanović -Arsić, N. Sremčević, N. Jevtić, D. Gogić
- 62 0203 - The effect of horizontal® therapy on functional recovery of patients with lumbar discus hernia S. Marković, - J. Milovanović-Arsić, A. Jokić, N. Sremčević, K. Hansjürgens
- 62 0204 - The effect of balneophysical treatment on functional recovery of patients with implanted hip endoprosthesis of diverse etiologies - S. Radulović, S. Marković, N. Sremčević, A. Jokić,
- 62 0205 - Locked-in syndrome: a project for independent living after returning home - A. Giovagnoli, G. Lo Vullo, C. Stea, E. Fragiaco, G. Cattunar
- 63 0206 - A Preliminary Assessment of the Benefits of the Addition of Botulinum Toxin A Free of Complexing Proteins (XEOMIN®) to a Conventional Therapy Program..... - V. Rossi, M. Casaleggio, S. Baietta, C. Bet, A. Crovetto, S. Pistoni, D. Dall'Agata
- 63 0208 - Physiotherapeutic protocol for the fractures of distal radius treated with internal or external fixation - K. Kateros, V. I. Sakellariou, H. Tsibidakis, A. Farmakidis, G. Mazis, I. Sofianos
- 63 0209 - Blount disease treated with TSF (taylor spatial frame) external fixation. Mobilization - H. Tsibidakis, A. Farmakidis, V. I. Sakellariou, V. Tsouparopoulos, G. Karaliotas, G. Mazis, A. Kanellopoulos
- 63 0210 - Clinical outcome of lower limb deformities treated with TSF (taylor spatial frame) and early mobilization - H. Tsibidakis, V. I. Sakellariou, A. Farmakidis, G. Karaliotas, V. Tsouparopoulos, M. Kaligerou, A. Kanellopoulos
- 64 0211 - Congenital talipes equinovarus treated with Ponseti method - H. Tsibidakis, A. Farmakidis, V.I. Sakellariou, G. Karaliotas, G. Mazis, M. Kaligerou, A. Kanellopoulos
- 64 0212 - Acute dislocation of acromioclavicular joint (ACJ) treated with a modification of weaver-dunn method - V. I. Sakellariou, H. Tsibidakis, A. Farmakidis, E. Fandridis, S. Spiridonos, F. Giannoulis, N. Gerostathopoulos
- 64 0213 - Internal hemipelvectomy and reconstruction for periacetabular sarcomas. clinical outcome and applied physiotherapeutic protocol - H. Tsibidakis, V.I. Sakellariou, G. Mazis, G. Karaliotas, M. Kaligerou, A. Farmakidis, A. Mazis, P.J. Papagelopoulos
- 64 0214 - Limb salvage using a new intramedullary diaphyseal segmental fixation system - Sakellariou VI, Mavrogenis AF, Tsibidakis H, Mazis G, Farmakidis A, Papagelopoulos P.J.
- 64 0215 - Tibial adamantinoma managed with intramedullary diaphyseal segmental defect fixation system - V. I. Sakellariou, AF. Mavrogenis, H. Tsibidakis, A. Farmakidis, A. Mazis, V. Tsouparopoulos, PJ Papagelopoulos
- 65 0216 - Inpatient rehabilitation of patients with medically unexplained disability - A. Al-khayer, C. Breda
- 65 0217 - Ultrasound Guided Injection Technique in Rehabilitation Medicine - C. P. C. Chen, S. F. T. Tang
- 65 0220 - Extracorporeal shock wave therapy in the treatment of lateral epicondylitis, Does number of sessions make any difference? Is sonography effective..... - Nural Albayrak Aydin, Eser Sanverdi, Filiz Fitoz, Kamil Yazicioglu
- 66 0221 - The effect of tilt-table therapy on pulmonary functions in tetraplegic and high level paraplegic patients - D. Ilbars, M. Taşkaynatan, K. Yazicioğlu, N. A. Aydin
- 66 0222 - The therapeutic effects of physical therapy, local steroid injection and eswt in patients with lateral epicondylitis: clinical and sonographic comparison - R. Yazıcı, P. Borman, S. Kocaoglu, L. Ozcakar
- 66 0223 - The study of vestibular function in patients with multiple sclerosis - A. H. Naguib, G. A. Achmawi, H. Kozo, A. M. Fatatry
- 66 0224 - Sympathetic skin response in relapsing remitting type of multiple sclerosis - H.M. Abdel Ghani, G.A. Achmawi
- 67 0225 - Motor Evoked Potential Changes following Bilateral Arm Training With Rhythmic Auditory Cueing In Chronic Hemiplegia - T. S. Shafshak, W. Aly, E. Shaheen
- 67 0226 - Patients with refractory angina treated with enhanced external counter pulsation show functional recovery at long-term follow-up - D. L. Braverman, C. Crane, RN, L. M. Adamczyk, M. A. DiVita, C. V. Granger
- 67 0227 - Assessment of risk of falls in elderly people at home - F. Vallone, M. Repetto, C. Giorgini, N. Corrieri
- 67 0228 - Rehabilitation of War-Related Lower Limb Amputees in Kosovo - T. Osmani-Vllasolli, H. Hundozi, C. Bytyçi, A. Kalaveshi
- 68 0229 - Self-reported functions causing inconvenience to LBP patients - C. Suominen, K. Laimi, J. J. Salminen, R. Tuominen
- 68 0230 - Study of effect of Robotic therapy on the gait strategy in patients after stroke - A..S Klochkov, A.V. Voronov, A.A. Telenkov, L. A. Chernikova
- 68 0231 - Early rehabilitation in patients with humerus fracture followed by radial nerve palsy - Stojicic-Djulich S., Lesic A., Zagorac S., Krunic-Protic R., Vesovic-Potic V.
- 68 0232 - Early and late development of heterotopic ossification in traumatic spinal cord injury: a case series - R. E. Heriseanu, G. Weber
- 69 0233 - Measurement of facial movements with Photoshop software - A. Pourmomeny, H. Aseiaei, M. Meirshamsi, S. Amier-rajab
- 69 0234 - The relationships between clinical and functional parameters in rehabilitation of young people with patellofemoral pain syndrome - R. Traistaru, R. Popescu, D. Matei, O. Rogoveanu
- 69 0235 - Pulmonary rehabilitation and alpha 1-antitrypsin level in chronic asthmatic patients - R. Traistaru, D. Matei, R. Popescu

- 69 0236 - Lower motor neurons loss in cervical myotomes in amyotrophic lateral sclerosis - S. Pinto, M. de Carvalho
- 70 0237 - The Cradle©, an enriched environment - M. Cerioli
- 70 0238 - A multilevel Orthose© in neurodevelopment perspective - M. Cariole
- 70 0239 - Development of the Italian Version of the Tampa Scale of Kinesiophobia for low back pain. Cross-cultural adaptation, factor analysis, reliability and validity - M. Monticone, I. Giorgi, P. Baiardi, B. Rocca, M. Barbieri, C. Bonezzi
- 70 0241 - Demyelinating polyneuropathy in a patient with ankylosing spondylitis receiving infliximab treatment - O. Özdemir, A. Çetin, E. Esen, S. Kiraz
- 71 0242 - Efficacy of botulinum toxin type a on functional impairment of degenerative hip joint: preliminary results - M. Acler, C. Marchini, M. A. Bolognari, A. Causero, D. Volpe, D. Regis, A. Rizzo, R. Rosa, R. Eleopra, P. Manganotti
- 71 0243 - Education for physical therapy on university degree of Macedonia - E. Popova Ramova, S. Ristevska, A. Poposka
- 71 0244 - A new method for assessing physical activity at home: preliminary study in COPD patients admitted to a pulmonary rehabilitation programme - F. Giuntoli, M. Boni, L. Ieri, I. Gelli, T. Valentino, C. Quiriconi, L. Bertuccelli, S. Lange, E. Salotti, E. Tommasi, M.L. Galardini, R. Lorenzini, N. Borrelli.
- 71 0245 - Maintenance of respiratory outcomes by repeated pulmonary rehabilitation: a 3-years trial - F. Giuntoli, M. Boni, L. Ieri, I. Gelli, T. Valentino, S. Lange, C. Quiriconi, L. Bertuccelli, E. Salotti, B. Corsi, M. Campioni.
- 72 0246 - Hand osteoarthritis: relationship between radiological changes, strength and disability - S. Canpolat, P. Borman, E. Ceceli, M. Okumus
- 72 0247 - Rehabilitation in Ankylosing Spondylitis: a castic contribution - F. Giannetto, G. Scavo, D. Sambataro, C. Mazzone, G. Rinaldi
- 72 0248 - Identifying characteristics of geriatric patients that referred to outpatient clinics of Physical Medicine and Rehabilitation: A report of multicenter nationwide study - P. Borman, M. Okumus, E. Ceceli, A. Dogan, Y. Gokce-Kutsal, and Geriatric Rehabilitation Group of Turkish Society of PMR
- 72 0249 - Assistive technology: a challenge towards independence - F. Tebaldi, F. Scarpetta
- 73 0250 - Gait analysis and Winter's classification of hemiplegic children - A. Nascimbeni, A. Gaffuri, M. Rigano, C. Foglia, S. Ghiringhello, F. Sabatini
- 73 0251 - New technologies to measure hoarseness (Dysphonia) recovery following phonological rehabilitation in a patient with central hemi-laryngeal palsy - R. Semprini, G. Albertini, M. Franceschini, E. Palma, A. Pierallini, M. Mignano
- 73 0252 - Writing a booklet for patients about Complex Regional Pain Syndrome (CRPS1): relevance and satisfaction of professionals and patients - C. Favre, O. Deriaz, M. Konzelmann, J. Savoy, F. Luthi
- 73 0253 - Care-related pain in a rehabilitation hospital: how patients' and professionals' perceive it? - Christine Favre, Régis Hanon, Olivier Deriaz, François Luthi
- 74 0254 - Scoliosis and body schema disorders: an experimental study in 48 patients with adolescent idiopathic scoliosis - A. Picelli, S. Negrini, A. Zenorini, F. Zaina, S. Mion, N. Smania
- 74 0255 - Comparison of rehabilitation delivery and mobility outcome following lower limb amputation in centres in three European countries: a step towards developing standardised.... - K. Sansam, V. Neumann, N. H. Ryall, R. J. O'Connor, B. Bhakta, G. M. Rommers (UK, Ireland, The Netherlands)
- 74 0256 - Benefits on fatigue, spasticity perception and quality of life determined by Therapeutic Exercise in Hypogravity Environment in patients with mild to moderate Multiple Sclerosis..... - E. Magni, C. Ljoka, G. Della Bella, C. Foti
- 75 0257 - Patient characteristics influencing rehabilitation outcome post osteoporotic fractures - M. Trócsányi, G. Fazekas, K. Dobai
- 75 0258 - The Change of the Radiographic Measurements and the Pain in Patients With Patellofemoral Pain Syndrome After Therapeutic Exercise Program - K. Dug-Young, L. Kil-Byung, J. Tae-Ho, K. Young-Sup
- 75 0259 - Balneotherapy in treatment of spastic upper limb after stroke - M. Stefanovski, G. Stefanovski, T. Erceg
- 75 0260 - Detectable threshold of knee effusion by ultrasonography in osteoarthritis patients - L. Jong In, H. Bo Young, L. Seong Hoon, C. Ye Rim, K. Hye Won, K. Young Jin
- 76 0261 - The effect of hand size on the stimulus intensities required for median and ulnar sensory nerve conduction studies -
- 76 0262 - fMRI correlates of early aphasia rehabilitation after stroke - F. Mattioli, C. Sottini, M. Magoni, C. Ambrosi, R. Gasparotti
- 76 0264 - Handgrip strength as a prognostic of short-term survival among inpatients at a palliative care unit - D. Colprim, M. F. Rojas, C. Farrivals, M. Riera, T. Prat, M. Luna, J. Planas, JM. Muniesa, Unitat Cures
- 76 0265 - Short term outcome effects of selective dorsal rhizotomy (SDR) in patients with cerebral palsy - L. Boscolo Bozza, M. Santin, M. Coluccini, G. Sabrina, A. Salghetti, S. Zeme, E. Trevisi
- 77 0266 - Dynamometry 's predictive value in hospitalized elderly patients - M. F. Rojas, M. Arellano, J. M. Muniesa, M. Pi-Figueras, M. D. Sánchez, F. Escalada, O. Sabartés, M. A. Márquez
- 77 0267 - Results after developing a standard program to assess Dysphagia in a Rehabilitation Department - A. Guillén Solà, M. F. Rojas Padilla, R. Boza Gómez, E. Duarte Ollé, R. Belmonte Martínez, M. Tejero Sánchez, E. M. Navarro
- 77 0268 - The impact of cognitive status at admission on functional outcome of elderly hip fracture patients at discharge - E. Dubljanin-Raspopovic, S. Tomanovic, M. Manojlovic, T. Radovanovic, U. Nedeljkovic, N. Krstic, N. Ilic, S. Markovic, V. Vesovic Potic
- 77 0269 - Adaptation and validation of the Ankylosing Spondylitis Work Instability Scale (AS-WIS) for use in Turkey - A. A. Kucukdeveci, S. Ataman, A. Genc, S. Kutlay, A. H. Elhan, A. Tennant
- 78 0270 - Effects of intrathecal ziconotide and baclofen on pain and spasticity in spinal cord injury - G. Stampacchia, E. Bradascchia, A. Gerini, G. Sanguinetti, M. Menarini
- 78 0271 - Efficacy of physical agents in management of chronic Low Back Pain (LBP) - M. Nazzal, Z. Auwaidat, Z. Subaih, M. Maaiah, M. Nazzal
- 78 0272 - Long thoracic nerve palsy in three cases - A. Farmakides, V. Aggeli, I. Sioutis, N. Roussos, V. Mani, S. Fotaki, D. Patatoukas

- 78 0273 - Incidence and risk factors of heterotopic ossification in traumatic brain injury - G. Fotinopoulos, V. Aggeli, E. Chalida, N. Roussos, I. Sioutis, V. Mitsis, D. Patatoukas
- 78 0274 - Factors influencing length of stay in patients with traumatic brain injury - E. Chalida, V. Aggeli, G. Fotinopoulos, I. Sioutis, N. Roussos, S. Fotaki, D. Patatoukas
- 79 0276 - Change in Quality of Life of Disabled Patients after Intensive Inpatient Rehabilitation at Siriraj Hospital - T. Ploypetch, P. Dajpratham
- 79 0277 - Bioethics and Rehabilitation - F. Giannetto, D. Sambataro
- 79 0278 - Particularities of diagnosis and evolution of progressive ossifying fibrodysplasia (FOP) - R. Popescu, O. Rogoveanu, Ș. Gavrilă, R. Trăistaru
- 79 0279 - The electrophysiological evaluation of the medical recovery programme of patients with stroke related motor deficit - R. Popescu, O. Rogoveanu, R. Trăistaru
- 80 0280 - Coaching and rehabilitation team. "Happy team" - J. Molins, M. Valdés, TR. Fernández, E. Calero, S. Ródenas, R. San Segundo
- 80 0281 - Coaching and rehabilitation. Coaching's descriptive preliminary study applied to rehabilitation patients cases - J. Molins, TR. Fernández, R. San Segundo, E. Calero, S. Ródenas, M. Valdés
- 80 0282 - Prevention of venous thromboembolic complications in post-acute stroke patients: it can be done better! - J. M. Kruitbosch, C. P. Pijlman
- 80 0283 - Assessment of disability in knee osteoarthritis - D. Drăgoi, D. Matei, R. Trăistaru, R. Popescu
- 81 0284 - The role of obesity in knee osteoarthritis patients - D. Drăgoi, D. Matei, R. Popescu, R. Trăistaru
- 81 0285 - Bone Mineral Content of the Upper Extremities after Stroke - B. Celik, K. Ones, N. Ince
- 81 0286 - RANKL inhibition as a targeted approach in the treatment of osteoporosis - A. Nardi
- 81 0287 - Percutaneous radiofrequency in the hip osteoarthritis and rehabilitation - C. Mariconda, F. Rivera, M. Barbieri, G. Annaratone
- 82 0288 - Skeletal Muscle Mass of the Upper Extremities after Stroke - B. Celik, K. Ones, N. Ince
- 82 0289 - Motor relearning program and observation therapy: Minimal Protocol for Stroke (PMIC) as tool of comparison - Ferrero L. Tacchini V. Garrè O. Bellora A., Polverelli M.
- 82 0290 - The lateral fracture of brittleness femur: new pharmacological and rehabilitation approach - N. Sala, C. Venza, G. Letizia Mauro
- 82 0291 - The intraobserver and interobserver reliability of the Compangle, a new goniometer for joint angle measurements of the hand and wrist - A.N.G. van Pruijssen-Romijn, RW Selles, TAR Schreuders, H.J. Stam
- 83 0292 - Quantitative Sensory Testing - a useful tool in the diagnosis of Complex Regional Pain Syndrome - O. Schuhfried, M. Herceg, G. Vacariu (Austria)
- 83 0293 - Kinematic analysis of drinking from a glass in a population with tetraplegia - A. De los Reyes-Guzmán, A. Gil-Agudo, A. Del Ama-Espinosa, B. Peñasco-Martín, M. Solís Mozos, E. Pérez-Rizo
- 83 0294 - The effect of hand size on the stimulus intensities required for median and ulnar sensory nerve conduction studies - G. Srisawasdi, T. Thanakiatpinyo
- 83 0295 - Protocollo di Minima per l'ictus cerebrale (PMIC) - a protocol for the evaluation of the outcome and the rehabilitative care of stroke patients:..... - P. Fornasari, S. Montanari, G. Teodorani
- 84 0296 - Comparison of nerve conduction studies to clinical findings in the diagnosis of neuropathy of the ulnar nerve at the elbow - V. Aggeli, V. Doulias, I. Sioutis, N. Roussos, C. Goumas, V. Mitsis, D. Patatoukas
- 84 0297 - Health Status and Disability in Women with Breast Cancer related Lymphoedema - T. Di Gregorio, V. Candoli, M. V. Filippi, G. Attisani, V. Gessaga, E. Bottura, G. A. Magagni, R. Galassi
- 84 0298 - Predictors of Weight Change in Cardiac Rehabilitation Patients - S. Pimentel, J. A. Rocha, A.L. Silva, V. Araújo, J. Maciel, F. Parada
- 85 0299 - The influence of cardiovascular procedure type and postoperative complications on 6 minutes walking test (6MWT) in patients subjected to cardiologic rehabilitation - M. Mackiewicz-Milewska, A. Hoffmann, A. Kaszewska, P. Guzik, A. Glama, H. Mackiewicz-Nartowicz, D. Fabrowski
- 85 0300 - Urodynamic findings in patients with traumatic brain injury - M. Ersoz, K. Kaya, S. Akkus, S. Ozel
- 85 0301 - Metabolic syndrome patients – primary care can be more than usual care - C. Avram, S. Iurciuc, L. Craciun, A. Avram, M. Iurciuc, C. Ciulacu, D. Gaita
- 85 0302 - Endurance training and physical fitness in young metabolic syndrome patients - C. Avram, M. Oravitan, A. Nagel, L. D. Hoble, A. M. Rusu, R. G. Dragoi, C. A. Avram
- 86 0303 - Assessment of the severity of the autonomic lesion in spinal cord injury patients - J. G. Previnaire, P. Rigaux, V. Leclercq, J. M. Soler
- 86 0304 - Rehabilitation treatment patients with osteoarthritis. Own experiences - L. Raczo, A. Ogonowski, R. Kaczor
- 86 0305 - Effectiveness of active rehabilitation camps in case of children with myelomeningocele - J. Cieplińska, M. Lyp, R. Kaczor, A. Ogonowski
- 86 0306 - Quality of life of patients with lumbar disc hernia treated conservatively versus surgically treated cases - M. Cevei, D. Stoicanescu
- 87 0307 - Pathology of lumbar spine in women aged between 40-50 years - D. Stoicanescu, M. Cevei
- 87 0308 - Combined stabilization and straightening exercise program for chronic low back pain - A. Stankovic, M. Lazovic, M. Kocic
- 87 0309 - Nerve conduction tests in fibromyalgic patients – a prospective study with healthy controls - A. Lima, D. Leonardo, C. Afonso, A. C. Sousa, L. Gonçalves
- 87 0310 - Behavioral and Cognitive Functioning after Traumatic Brain Injury - A. Cavina, A. Cantagallo
- 88 0311 - Theory of mind in patients following traumatic brain injury - A. Geraci, L. Surian, M. Ferraro, A. Cantagallo
- 88 0312 - Analysis of the measurement properties of PMIC ("Protocollo di Minima per l'ictus cerebrale"): rationale and general methodology - F. Bovolenta, S. Caselli, F. Cappa, M. Mantovani, M. Faenza, P. Sale, M. Franceschini, F. La Porta on behalf of PMIC group
- 88 0313 - Analysis of the measurement properties of PMIC ("protocollo di minima per l'ictus cerebrale"): rasch analysis of motricity index and canadian neurological scale - G. Lenti, S. Caselli, F. Bovolenta, L. Perrero, M. Franceschini, F. La Porta
- 89 0314 - Analysis of the measurement properties of PMIC ("protocollo di minima per l'ictus cerebrale"): rasch

- analysis of barthel index and trunk control test - C. Da Re, S. Caselli, F. Bovolenta, D. Bonaiuti, M. Franceschini, F. La Porta
- 89 0315 - Diabetes and rehabilitation activity: a sure correlation. An initial Study - L. Scalzo, D. Galasso, I. Amelio, B. Farenza, M. Golia, I. Gabriele, V. Rubino
- 89 0316 - The Use of FIM Classification in a group of patients with cardiovascular disability: initial study in rehabilitation centre - L. Scalzo, A. M. Pirillo, A. Celia, E. Dardano, V. Bilotta, T. De Masi, I. Gabriele, L. Iannelli
- 89 0318 - Disability and quality of life in the mastectomy: Preliminary study - G. Crispino, B. Scornaienghi, L. Scalzo, I. Gabriele, L. Iannelli, R. Pedace
- 90 0319 - Our experience in the treatment of rotator cuff tears in the elderly patients by a infiltrative and rehabilitative treatment - C. Costantino, S. Olvirri, R. Ciraulo, E. Marangio
- 90 0320 - Labour inclusion of youths with disabilities – multidimensional assessment with ICF method – ICF multi-stringa experimentation - A. Lussu, G. Solinas, A. Bressan
- 90 0321 - Calcific tendinosis of shoulder. Extracorporeal shock wave therapy - J. A. Mirallas-Martínez, M.T. Sabater Querol, M.J. Casas-Lázaro, M. A. Mendoza-Latorre, N. Guardiola-Beltrán, S. Qudsi-Sinclair
- 90 0322 - Plantar Fasciitis. Extracorporeal shock wave therapy - J. A. Mirallas-Martínez, M. T. Sabater-Querol, M. A. Mendoza-Latorre, N. Guardiola-Beltrán, S. Qudsi-Sinclair, M. J. Casas-Lázaro.
- 91 0323 - Lateral epicondylitis. Extracorporeal shock wave therapy - J. A. Mirallas-Martínez, T. Ricarte-Benedito, Tudela-Salom, M. Consuelo, M. A. Mendoza-Latorre, N., Guardiola-Beltrán, M. J. Casas-Lázaro, S. Qudsi-Sinclair
- 91 0325 - Principles of neurogenic dysphagia rehabilitation - I. Avdyunina, L. Chernikova, E. Berdnikovich, N. Dokuchaeva, V. Selivanov
- 91 0326 - Characteristics and Prognosis of Pusher Syndrome in Stroke Patients - K. Sang Beom, L. Kyeong Woo, L. Jong Hwa
- 91 0327 - Anxiety and depressive symptomatology in Multiple Sclerosis patients with vesicourethral and sexual dysfunction. Preliminary data study - D. Marin, L. Monti Bragadin, E. Biasutti, P. Di Benedetto
- 92 0328 - Soft-tissue surgery and Botulinum toxin treatment in hemiplegic subjects with lower limb spasticity - C. Lentino, G. A. Checchia, A. Barbano, G. Vigo
- 92 0329 - Gait Analysis to assess Kinesio Taping Method® efficacy in Neurological Patients - C. Lentino, G.A. Checchia, N. Camuzzini, G. Corvaglia, G. Vigo
- 92 0330 - Do orthopaedic shoes improve dynamic stability of gait in patients with severe foot&ankle injuries? - P. Terrier, F. Luthi, O. Dériaz
- 92 0331 - The assessment of the prevalence rate of cerebrovascular incidents in patients having undergone Coronary Artery Bypass Graft (CABG) surgeries and complex cardiac surgeries..... - I. Denisewicz, A. Karczmarczyk, A. Brzeziński, S. Waligórski, M. Brykczyński, M. Mackiewicz-Milewska
- 93 0332 - 100 Hz vibration of the antagonistic muscle is able to reduce upper limb flexion spasticity in hemiplegic patients - C. Damiani, T. Sciarra, V. Rosati, P.L. Chimento, C. Fundarò, C. Foti, R. Casale
- 93 0333 - Mirror therapy in the rehabilitation of lower limb amputees: are there any contraindications? - R. Casale, V. Rosati, C. Fundarò, I. Clemenzi, C. Foti, P.L. Chimento, C. Damiani
- 93 0334 - Effectiveness of a comprehensive rehabilitation program in association with paracetamol at improving pain in a group of relatively young people affected by severe OA on waiting..... - R. Casale, C. Damiani, V. Rosati, T. Sciarra, P.L. Chimento, C. Fundarò, C. Foti
- 93 0335 - Acute stroke assessment in rehabilitation: proposal of a common regional multicentric dataset - L. Carcelli, V. Di Giuseppe, M. Franceschini, C. Damiani
- 94 0336 - Tai – Chi effects on balance, mobility, and gait in Parkinson disease: preliminary study - C. Damiani, S. Cassarino, S. Ippolito, L. BestaVashvili, R. Casale, I. Clemenzi, C. Foti
- 94 0337 - The impact of body image disturbance on rehabilitation programs in lower limb amputees: a pilot study - C. Damiani, V. Rosati, R. Casale, I. Clemenzi, V. Dell'Armi, C. Foti
- 94 0338 - Reability of a new video anlysis software to assess visuomotor skills - M. Bejor, E. De Bernardi, C. Pavese, M. Chiappedi, E. Dalla Toffola
- 95 0339 - Autonomy assessment one year after stroke: predictors of functional outcomes - E. Medici, R. Lorenzetti, P. Giacchetti, E. Giaccaglini, M. Sebastianelli, S. Franceschini, R. Casci, P. Orazi, B. Gobbi, M. Baroni
- 95 0340 - Are football muscle lesions related to anthropometry? Preliminary results of an observational study - A. Fusco, L. Cretaro, M. Iosa, G. Morone, F. Margutti, F. Ioannilli
- 95 0341 - Autonomy in recreational activities like a goal/instrument in rehabilitation - D. Bonaiuti
- 95 0342 - Functioning of patients with breast cancer - H. Burger, N. Bešić
- 96 0343 - Furlong hip arthroplasty: functional 7-year follow-up analysis of a patient population - A. Zambito, D. Bianchini, C. Dall'oca, N. Smania, R. Aldegheri
- 96 0344 - Analysis of the normal and modified gait in a population of healthy subjects - A. Zambito, P. Fumene Feruglio, C. Manganotti, M. Bertagna, P. Pernigo, G. Crimi, N. Smania, A. Sbarbati, P. Bartolozzi
- 96 0345 - Interferential and horizontal therapies in chronic low back pain due to multiple vertebral fractures: a randomized, double blind, clinical study - A. Zambito, D. Bianchini, D. Gatti, M. Rossini, S. Adami, O. Viapiana
- 96 0346 - Respiratory complications after orthotopic liver transplant - AL. Hijas Gómez, M. Sevilla Benitez, C. Resino Luis, M. Ramos Solchaga, C. Abad Fernández, P. Gotor Ferrer
- 96 0347 - Left Ventricular Assist Device, A Step Up For Cardiac Transplantation - AL. Hijas Gómez, C. Resino Luis, M. Sevilla Benitez, M. Ramos Solchaga, J. Montilla Dominguez, N. Perez Fernandez
- 97 0348 - Family with charcot-marie-tooth disease. findings in gait analysis and treatment - V. Mani, N. Roussos, V. Aggeli, I. Sioutis, N. Lykos, C. Goumas, D. Patatoukas
- 97 0349 - Does treadmill and partial body weight support training reduce time of gait recovery after stroke? - S. Bargellesi, C. Brescacin, S. Scapolan, F. Faliero
- 97 0350 - Neuropsychiatric disorders in patients with severe Traumatic Brain Injury (TBI): prevalence, phenomenology and relationship with clinical and functional features - P. Ciarli, R. Formisano, U. Bivona, A. Cantagallo, P. Angelelli
- 97 0353 - Driving with disability: from idea to realization - E. Skikic-Mujic, P. H. Khadse, S. Trebinjac, P. Richardson

- 98 0354 - Comparison between 2 VS (Vegetative State) populations: cerebrovascular accident (CVA) and anoxic brain injury (ABI). Clinical and rehabilitative profiles - C. Perin, C. Cornaggia, V. Rega, D. Ruiu, C. Cerrri
- 98 0355 - Results of complex rehabilitation treatment in patients with ankylosing spondylitis - I. R. Marcu, S. Patru, A. Bighea, R. Popescu
- 98 0356 - Gait modification after 2 years of rehabilitation treatment for the child with cerebral palsy - D. Caimac, R. Marcu, S. Patru, E. Rosulescu, M. Zavaleanu
- 98 0357 - Effects of physical-kinetic therapy on quality of life in patients with psoriatic arthritis - I. R. Marcu, S. Patru, C. V. Danut
- 99 0358 - Osteoporosis in patients with early ankylosing spondylitis - I. R. Marcu, S. Patru, O. Rogoveanu, R. Popescu
- 99 0359 - Decannulation procedures after serious brain injuries - M. Mackiewicz-Milewska, H. Mackiewicz-Nartowicz, S. Lach-Inszcak, A. Sinkiewicz, W. Hagner
- 99 0360 - Heterotopic ossification after hypoxic brain damage - M. Mackiewicz-Milewska, S. Jung, S. Borland, S. Lach-Inszcak, I. Szymkuć, J. Cieściński, W. Hagner, W. Lasek
- 99 0361 - Construct validity of the ICF Core Set for Osteoarthritis by Rasch analysis: can it be used as a measuring tool? - S. Kutlay, Y. Kurtais Aytür, A.A. Kucukdeveci, D. Oztuna, M. Hafiz, A. Tennant
- 100 0362 - A Randomised Controlled Clinical Trial Comparing Two Different Types Of Transcutaneous Electrical Nerve Stimulation (TENS) With Gabapentin In Neuropathic Pain - A. Dicle Turhanoglu, E. Okuyucu, H. Güler, A. Mansuroglu, C. Ozer
- 100 0363 - The RTRC Chronic Fatigue Programme - R. Weller
- 100 0364 - Modulated midfrequency electrotherapy as treatment modality of acute low back pain: a pilot study - E. Atabas
- 100 0366 - Comparison of ultrasound (US)-guided intra-articular injections on the three different sites of the knee - P. Yong Bum, L. Dong Woo
- 100 0367 - A new method of ultrasound-guided intra-articular injections in the knee through the suprapatellar bursa - P. Yong Bum, L. Dong Woo
- 101 0368 - Therapeutic non-pharmacological approach to reduce risks of falling in osteoporotic outpatients older than 70 years - D. M. Carlucci, G. Zanardi, P. Chiodera, V. Coiro
- 101 0369 - Effect of Lidocaine Iontophoresis on Pain during Needle EMG - A. Morchower, T. Annaswamy
- 101 0370 - Neuroplasticity after spinal cord injury: effects of a walking training - E. Bizzarini, C. Pinzini, C. Urgesi, G. De Maio, M. Maieron, S. D'Agostini, C. De Colle, B. Tomasino, L. Weis, P. Cappellaro, A. Zampa
- 101 0371 - Influence of exercise training before coronary artery bypass surgery on in-hospital perioperative complications - H. Branea, C. Streian, I. Gyalai, M. C. Tomescu
- 102 0372 - Role of general practitioners in rehabilitation after heart surgery - H. Branea, I. Tatar, I. Gyalai, M. Tomescu
- 102 0373 - Electrical stimulation would be an alternative to rehabilitation training in patients with Peripheral arterial diseases (PAD) - M. Nagasaka, P. Dobsak, K. Muroya, N. Mori, S. Ebihara, H. Kurosawa, O. Ito, M. Kohzuki
- 102 0374 - Neuropathic pain in idiopathic carpal tunnel syndrome: the relationships between clinical, electrophysiological findings and disability - E. Cetinkaya, A. Karagoz, H. Erdem, B. Nacir, H. Genc
- 102 0375 - Severe osteoporosis: synergic action between pharmacological and rehabilitative treatment - G. Barbera, G. Cardona, L. Lauricella, M. F. Pisano, P. Cataldo, G. Letizia Mauro
- 103 0376 - Tecar-therapy in the low back pain in acute phase: our experience - G. Sanguedolce, C. Venza, M.L. De Luca, F. Scaglia, N. Di Bella, G. Letizia Mauro
- 103 0377 - Case-control study in an integrated treatment of gonarthrosis using magnetotherapy and therapeutic exercise VS the same treatment in association with endo-articular injections - L. Lauricella, G. Barbera, G. Cardona, E. Geraci, G. Letizia Mauro
- 103 0378 - Our experience in the rehabilitation of fractures of the upper ankle - N. Stojanovic, B. Katancevic, D. Veljkovic, S. Golubovic, T. Matejevic
- 104 0379 - Algodystrophic Syndrome and in loco-typico fractures - B. Katancevic, N. Stojanovic, D. Veljkovic, S. Golubovic, T. Matejevic
- 104 0380 - Osteoporosis in men - U. Akarirmak
- 104 0381 - Possibilities of neuroplasticity stimulation after surgical treatment of carpal tunnel - C. Milicin, D. Mihai, T. Hoinoiu, D. Razvan, G. Noditi, D. Nemes
- 104 0382 - Does human gait exhibit comparable and reproducible long-range autocorrelations on level ground and on treadmill? - Bollens B, Crevecoeur F, Nguyen V, Detrembleur, Lejeune T
- 105 0383 - Dynamic Postural Control - D. Cooper
- 105 0384 - Abnormal activation of knee and ankle flexors-extensors is related to altered gait in ankylosing spondylitis - E. Carraro, Z. Sawacha, S. Del Din, F. Spolaor, A. Guiotto, A. R. Gravina, R. Guglielmin, C. Cobelli, S. Masiero
- 105 0385 - Rehabilitation of a girl with Opsoclonus-myoclonus syndrome: case report - B. Marjanović, D. Stevanović-Papić, V. Šolaja, D. Dragić, G. Mirković
- 105 0386 - Correlation between clinical and laboratory measures in chronic stroke subjects - E. Carraro, Z. Sawacha, A. Guiotto, P. Contessa, S. Del Din, C. Cobelli, S. Masiero
- 105 0387 - Job stress and health professionals: a clinical trial about a tertiary intervention for the stress management - B. Corrado, F. De Marco, V. Barletta, C. Servodio Iammarrone
- 106 0388 - Calcification of the ligamentum flavum as a rare cause of lumbar spinal stenosis – Case report - S. Amorim, S. Toste, S. Magalhães, J. Macedo, A. Trêpa
- 106 0389 - Analysis and evaluation of anthropometric, biochemical and energy expenditure parameters in a sample of patients admitted in our physical medicine and rehabilitation unit - D. Primon, L. Zanasca, M. Scapolo, S. Andreatta, B. Ruzzante, P. Galliani, L. Rocco, C. Scremin, A. Morbiato, A. M. Gonzalez
- 106 0391 - A Rehabilitation Department model for a territorial service network with an ad hoc public health budget management - P. Saccavino, C. Mariani, M. Sarcinella, M. Tavoni
- 106 0392 - An innovative model for a multidisciplinary approach to lumbago diagnosis and rehabilitation treatment - P. Saccavino, C. Mariani, M. Tavoni, U. Mirarchi, M. Arnoldo, P. Gorgerino, M. G. Lento, A. Cerrano
- 107 0393 - Prevention of pressure sores in a rehabilitation center - M. Enjalbert, N. Chaffaut, F. Galtier, T. Bouchemat, R. Benyahya
- 107 0394 - Quality's Indicators in PRM - M. Enjalbert, F. Rossband, J. M. Théry, C. Leblond, J. P. Crudo

- 107** 0395 - Effects of sulphate-sulphide mineral water "Mlječanica" on patients with hypertension - S. Marković, M. Stefanovski, T. Erceg
- 108** 0396 - Effect of eccentric versus concentric exercise on skeletal muscle of rats: changes in mitochondrial function and emergence of oxidative stress - M. E. Isner-Horobeti, E. Lonsdorfer-Wolf, L. Rasseneur, S. Doutreleau, S. Dufour, F. Daussin, Y. Burelle, B. Geny, P. Vautravers, R. Richard
- 108** 0397 - Analysis of the measurement properties of brass index: a rasch analysis study - L. Panella, S. Caselli, F. La Porta, E. Fanton, S. Cuca Varsalona
- 108** 0398 - Home Based versus Hospital Based Cardiac Rehabilitation in patient with Coronary Disease: Prospective Study - S. Magalhães, H. Costa, M. M. Ribeiro, P. Fernandes, A. Barreira, S. Gonçalves
- 108** 0399 - Physical therapy and rehabilitation of a patient with break of blade in post immobilization phase- case report - S. Popeskov, S. Jandrić, B. Milić-Krčum, D. Savičić, S. Vujaković, T. Nožica-Radulović, T. Bučma, D. Janković, S. Balaban (Republic of Srpska)
- 109** 0400 - Custom lower limb orthoses, designed according to a new multidimensional approach, for facioscapulo-humeral muscular dystrophy (FSHD) patients - I. Aprile, C. Bordieri, A. Gilardi, M. Lanieri Milazzo, F. De Santis, R. Frusciant, E. Iannaccone, E. Ricci, L. Padua
- 109** 0401 - Walking and balance in facioscapulo-humeral muscular dystrophy (FSHD): clinical and instrumental assessment - I. Aprile, A. Gilardi, C. Bordieri, M. Iosa, R. Frusciant, E. Iannaccone, E. Ricci, L. Padua
- 109** 0402 - Low back pain in facioscapulo-humeral muscular dystrophy - I. Aprile, S. Messina, G. Frasca, R. Frusciant, E. Iannaccone, M. Iosa, L. Padua, E. Ricci
- 109** 0403 - Plasticity of organization outpatient. experience in the region of Lazio rehabilitation center of S. Maria della Pace Rome - N. A. Arena, A. E. Ruggeri, L. Padua, V. Gazzetti
- 110** 0404 - Treatment for ulnar neuropathy at the elbow. a systematic review - P. Caliandro, G. La Torre, R. Padua, F. Giannini, L. Padua
- 110** 0405 - Cortical control of gait in patients with Ataxia - P. Caliandro, G. Silvestri, I. Minciotti, G. Russo, P.A. Tonali, L. Padua
- 110** 0406 - Pain in Ehlers-danlos syndrome - F. Camerota, C. Celletti, M. Castori, C. Pazzaglia, L. Padua
- 111** 0407 - Focal Muscle vibration in the treatment of upper limb spasticity: a pilot randomized controlled trial in chronic stroke patients - F. Camerota, P. Caliandro, C. Celletti, G. Granata, G. Russo, G. Galeoto, I. Minciotti, I. Campa, L. Padua
- 111** 0408 - Quality of life in Ehlers-Danlos syndrome - C. Celletti, F. Camerota, M. Castori, L. Padua
- 111** 0409 - Group rehabilitation versus individual rehabilitation following knee and hip arthroprothesis - F. De Santis, I. Aprile, A. Gilardi, G. Robustelli, R. S. Rizzo, L. Padua
- 111** 0410 - How ultrasound can assist neurophysiology to diagnose ulnar neuropathy at elbow - A. Di Pasquale, P. Caliandro, G. Granata, C. Pazzaglia, L. Hobson, C. Martinoli, L. Padua
- 112** 0411 - A protocol of early loading utilizing a body suspension system (body weight support) in post-stroke gait recovery: case control study - A. Gilardi, I. Aprile, F. Camerota, L. Padua, L. Cortellini
- 112** 0412 - Risk factors and incidence of spinal pain in an urban school children sample - A. Gilardi, I. Aprile, F. De Santis, M. T. Vincenzi, L. Padua, F. Savi Scarponi
- 112** 0413 - Posture and laterality: weight bearing in quiet standing. cross-sectional study - A. Gilardi, L. Padua, I. Aprile
- 113** 0414 - Levodopa effect on electromyographic activation patterns of tibialis anterior muscle during walking in Parkinson's disease - G. Granata, P. Caliandro, M. Ferrarin, M. Cioni, A. Bentivoglio, I. Minciotti, P. Tonali, P. I. D'Urso, L. Padua
- 113** 0415 - Contribution of ultrasound in traumatic nerve lesions - G. A. Liotta, A. Di Pasquale, C. Pazzaglia, G. Granata, P. Caliandro, P. De Franco, P. Girlanda, L. Padua
- 113** 0416 - Circulating CD8+perforin+lymphocytes correlate with physical disability in patients affected by multiple sclerosis - V. Nociti, G. Frisullo, R. Iorio, D. Plantone, A. K. Patanella, P. Tonali, L. Padua, A. P. Batocchi
- 113** 0417 - Mechanisms of neuropathic pain in a sample of charcot-marie-tooth 1 a: a laser evoked potential study - C. Pazzaglia, P. Caliandro, C. Vollono, D. Ferraro, D. Le Pera, P. Tonali, L. Padua, M. Valeriani
- 114** 0418 - Natural history of charcot-marie-tooth 2: 2-year follow-up of muscle strength, walking ability and quality of life - C. Pazzaglia, L. Padua, D. Pareyson, I. Aprile, T. Cavallaro, D. A. Quattrone, N. Rizzuto, G. Vita, P. Tonali, A. Schenone
- 114** 0419 - Comparison between two rehabilitative approaches in institutionalized patients - G. Battistelli, A.R. Pellegrino, L. Padua, B. Lucia
- 114** 0420 - Pain in post-surgical orthopaedic rehabilitation: a Don Gnocchi multicenter study - L. Padua, R. Molino Lova, C. Pazzaglia, F. Cecchi
- 115** 0421 - Construct validity of the ICF core set for chronic widespread pain by rasch analysis: can it be used as a measuring tool? - Y. Kurtais, D. Oztuna, A. Kucukdeveci, S. Kutlay, A. Genc, A. Tennant
- 115** 0422 - Compensatory visual training for patients with hemianopia after stroke - L. Gangoi, H. De La Corte, I. Villafruela
- 115** 0423 - Lipids targets achievement in EUROASPIRE III ROMANIA follow-up: from guidelines to clinical practice - Craciun L., Avram A., Iurciuc S., Avram C., Iurciuc M., Ciulacu C., Mancas S., Gaita D.
- 115** 0424 - Readiness of revascularized coronary patients to increase their physical activity level - Craciun L., Avram A., Iurciuc S., Avram C., Iurciuc M., Popovici C., Mancas S., Gaita D.
- 116** 0425 - A governance model for social health rehabilitation paths accessed via the "Punto Unico di Accesso" (PUA) (access point) - G. Frau, A. Lussu, A. Galleri, R. Giuso (Italy)
- 116** 0426 - The role of the isokinetics methodology in the functional evaluation and in the rehabilitation of the impingement syndrome treated with the extra corporal electrohydraulics shock waves - A. Minerva, L. Amoruso, M.P. Lo Muzio, V. Rastelli, A. Russo, A. Maruzzi, M.A. Micello, M. S. Martone, M. Panunzio, G. Cassatella, S. Filoni, A. Santamato, P. Fiore
- 116** 0427 - Outcome oriented rehabilitation following post-mastectomy breast reconstruction - V. Simone, M. P. Lo Muzio, M. Delli Bergoli, A. Russo, S. Filoni, M.T. Amoruso, M. A. Mimmo, M. S. Martone, A. Santamato, P. Fiore
- 116** 0428 - Effectiveness of a new device of electrical stimulation combined with botulinum toxin type A in the treatment of upper limb spasticity: preliminary results - A. Santamato, S. Filoni, A. Russo, F. Palano, A. Maruzzi, M.S. Martone, G. Di Gregorio, M. A. Mimmo, A. Minerva, L. Amoruso, M. T. Amoruso, A. Minerva, P. Fiore

- 117 0429 - Safety and efficacy of a new botulinum toxin type A in the therapy of upper limb spasticity: clinical results after one year of treatment - A. Santamato, S. Filoni, G. Cassatella, F. Palano, A. Maruzzi, M. F. Micello, S. Santovito, L. Amoruso, M. T. Amoruso, A. Minerva, P. Fiore
- 117 0430 - Short-term effects of high-intensity laser therapy versus ultrasound therapy in the treatment of low back pain: preliminary results - A. Santamato, G. Cassatella, F. Palano, A. Maruzzi, M. F. Micello, M. S. Martone, S. Santovito, L. Amoruso, M. T. Amoruso, V. Simone, A. Minerva, P. Fiore
- 117 0431 - Exercise training in patients on hemodialysis improves dialysis efficacy and physical performance - V. Simone, P. Delli Carri, N. Querques, L. Amoruso, M. Delli Bergoli, A. Minerva, A. Russo, L. Bonghi, A. Maruzzi, M. F. Micello, A. Santamato, P. Fiore
- 117 0432 - The role of the rehabilitative treatment and of the electrohydraulics extra corporal shock waves in the painful shoulder - A. Minerva, L. Amoruso, M. P. Lo Muzio, M. A. Mimmo, G. Cassatella, V. Rastelli, S. Filoni, A. Santamato, P. Fiore Micello, A. Santamato, P. Fiore
- 118 0433 - A proposal of a rehabilitative protocol in the adult obese - A. Minerva, V. Rastelli, M. A. Mimmo, S. Santovito, G. Cassatella, S. Filoni, V. Simone, M. S. Martone, M.F. Micello, A. Santamato, P. Fiore
- 118 0434 - Locked-in syndrome: use of Botox Toxine to superior limbs for the non verbal communication - V. Leoni, P. Belloglio, M. Callistri, S. Garbarino, G. Nunziati
- 118 0435 - Rehabilitation in critical illness - M. L. Rey-Pita, J. G. Armenteros-Pedrero, J. Muñoz-Mateo, R. Fiorillo, C. Fernandez-Caamaño, V. Lourido-Estevéz
- 118 0436 - Strontium ranelate effects in patients with bed rest syndrome. Clinical and instrumental evidence after 60 days of treatment - A. Rocco, R. Di Donna, G. Pacifici, M. Penna, S. Gentili, J. V. Faroni
- 119 0437 - Effectiveness of the treatment with peri-tendinous injection of hyaluronic acid in degenerative tendinopathy - A. Rocco, C. Ljoka, G. Tancredi, C. Foti
- 119 0438 - Depression in spondyloarthropathy and low back pain patients: pilot study - S. Milutinovic, M. Svenda-Zlatkovic, M. Zlatanovic, G. Radunovic
- 119 0439 - Effects of a robot-assisted locomotors training on emg activation in SCI subjects - G. Stampacchia, E. Bradaschia, A. Gerini, S. Mazzoleni, E. Cattin, B. Rossi, M. C. Carrozza
- 120 0440 - Comparison the of effects of frequency modulated neural stimulation and transcutaneous electrical nerve stimulation on clinical and magnetic resonance imaging findings..... - B. Koc, B. Nacir, H. R. Erdem, A. Karagoz, H. Yigit
- 120 0441 - Limb loading in hip arthroplasty female patients for a variety of daily activities - A. Oksanen, A. Myllymäki, J. J. Salminen
- 120 0442 - Acute Coronary Syndrome: Comparative cost between acute management and rehabilitation program - M.F. Rojas, E. Marco, M. Alzate, S. Ruíz, R. Boza, A. Guillen, J. M. Muniesa, E. Duarte
- 120 0443 - Non-neurogenic sphincter insufficiency in a child - S. Magalhães, J. Macedo, S. Amorim, A. Trepa
- 121 0444 - Home cardiac rehabilitation. An experience of alternative treatment for selected patients - P. Devetti, M. Sellan, P. Ursig, E. Fabbro, M. Werren, S. Baroselli, E. Petri, M. Carone, D. Tuniz
- 121 0445 - The effects of inpatient rheumatologic rehabilitation programs on the function and disease activity in chronic rheumatoid arthritis and ankylosing spondylitis: one-year follow-up - F. Figen Ayhan, Rukiye Yazıcı, Muharrem Geçene, Pınar Borman, Z. Rezan Yorgancıoğlu
- 121 0446 - Functional recovery in fragile elderly after discharge from a geriatric acute care unit - M. D. Sánchez, P. Puertas, O. Sabartés, M. Pi-Figueras, M. Arellano, M. A. Márquez
- 122 0447 - Effectiveness and efficiency of rehabilitation in a sub acute care geriatric unit - D. Sanchez Rodriguez, M^a Pi-Figueras, M. Arellano, J. M^a Muniesa, M. A. Marquez, O. Sabartés
- 122 0448 - Fuctional and cognitive outcome following traumatic, cerebrovascular and anoxic brain damage: study in 390 patients with severe acquired brain injury (ABI) - M. Gandolfi, L. Roncari, P. Girardi, R. Avesani, M.G. Gambini, V. Varalta, P. Ianes, A. Picelli, A. Fiaschi, N. Smania
- 122 0449 - Influence of oral apraxia in dysphasia recovery :study on 36 patients with stroke - M. Gandolfi, P. Zuccher, A. Picelli, A. Fiaschi, N. Smania
- 122 0450 - Grip-lift rehabilitation in chronic stroke adults - D. Dispa, T. Lejeune, J. Thonnard
- 123 0451 - WebRehab, the Swedish database for rehabilitation - Å.L. Nilsson, M. Lannsjö, A. Tölli, K.S. Sunnerhagen, A. Sörbo, U. Flansbjer
- 123 0452 - Robotic training can improve interjoint coordination and muscular activation in chronic hemiplegic stroke - M.C. Carboncini, A. Frisoli, G. Greco, I. Creatini, C. Procopio, L. Bonfiglio, B. Rossi, M. Bergamasco
- 123 0453 - The first three weeks after a stroke: analysis of care processes and outcomes - B. Bernardini, A. Grasso, S. Fracchia, S. Ghirmai, M. Pagani, G. Cerina, C. Corsini, M. Arleo, S. Respizzi, S. Marcheselli, V. Gasparroni
- 123 0454 - Engaging children in the design of rehabilitative games - R. J. Holt, M. J. Allsop, A. P. H. Weightman, J. F. Gallagher, M. C. Levesley, N. J. Preston and B. Bhakta
- 124 0456 - Functional assessment of patients with total hip replacement following three different surgical approaches - L. Berti, M. G. Benedetti, M. Boschi, K. Cremonini, S. Giannini
- 124 0457 - Combined GangTrainer GT1 and Transcranial Direct Current Stimulation in gait rehabilitation in chronic stroke patients: a randomized control trial - C. Geroin, D. Munari, A. Waldner, S. Hesse, C. Werner, A. Picelli, A. Fiaschi, M. Gandolfi, A. Zambito, N. Smania
- 124 0458 - Comparison of single and paired transcranial magnetic stimulation in the evaluation of spinal cord injuries - G. Isoardo, I. Rosso, E. Chesi, A. Palmitessa, G. Faccani, M. V. Actis
- 124 0459 - Peripheral nerve involvement in patients with traumatic complete cervical and thracic spinal cord injuries - G. Isoardo, I. Rosso, E. Chesi, A. Palmitessa, G. Faccani, M. V. Actis
- 125 0460 - Use of CT imaging in subjects with acquired severe brain injury: a retrospective study - T. Giorgini, L. Monti Bragadin, A. Voltazza, L. Iona, E. Biasutti, P. Di Benedetto
- 125 0461 - Walking speed changes after functional surgery in the first motoneuron syndrome - L. Granella, M. Marconetto, P. Imazio, L. Molino
- 125 0462 - Effects of low-level laserotherapy on functional status in different clinical periarticular disorders of shoulder - V. Savic
- 125 0463 - Impact of Clostridium Difficile Infection in a Rehabilitation Unit - S. Orini, C. Lecchi, C. Mulè, A. Maestri, N. Astolfi, G. Taveggia

- 126 0464 - Disease specific quality of life changes during first year after knee arthroplasty: can WOMAC index detect the difference of two distinct physical therapy programs? - M. Tali, J. Maaros
- 126 0465 - Brain lesions and spasticity: a voxel-based lesion-symptom mapping analysis on 51 patients - A. Picelli, F. Gajofatto, S. Tamburin, G. Zanette, V. Varalta, M. Gandolfi, A. Fiaschi, N. Smania
- 126 0466 - Comparison of the efficacy of ultrasound and laser treatments in subacromial impingement syndrome - H. T. Çalıř, N. Berberođlu, M. Çalıř
- 126 0467 - Cortical effects of polyneuropathy and potential consequences for conventional rehabilitation - J. W. G. Meijer
- 127 0469 - Electrical stimulation after botulinum toxin injection: a comparison between two different protocols. Preliminary results - C. Fontana, I. Storti, A. Picelli, S. Tamburin, D. Munari, M. Gandolfi, A. Zambito, A. Fiaschi, N. Smania
- 127 0471 - The l-acetylcarnitine in peripheral neuropathies - M. Megna, S. Altini, G. Ianieri, R. Marvulli, E. Romanelli, M. Ranieri, G. Megna
- 127 0472 - Case report: Using Botulinum toxin in Von Hippel-Lindau - Ianieri G., Marvulli R., Altini S., Tondi G., Mastromauro L., Ranieri M., Megna G.
- 128 0473 - Multidisciplinary rehabilitation for Parkinson's disease (PD): a pilot study - S. Cocci Grifoni, S. Mori, A. Calazzo, M. Capriotti, M. Salvi, C. Laterza, M. A. Vesceira, S. Cappelletti, F. Di Marzio, M. Vallasciani, M. Guidi
- 128 0474 - Respiratory failure in ALS patients. Ethical counselling in clinical choices: the experience in a rehabilitation unit - M. Bertini, K. Bernasconi, S. G. Colombo, E. Gandolfi, L. Gazzani, F. Zaro
- 128 0475 - Is Vitamin D a determinant of muscle mass and strength? - I. Marantes, E. J. Atkinson, S. J. Achenbach, S. Khosla, L. J. Melton, III, S. Amin
- 128 0476 - Integration of exercise and cognitive-behavioural interventions to increase physical activity among adults with chronic diseases - W. Geidl, J. Hofmann, K. Pfeifer
- 129 0477 - Radial Extracorporeal Shock-wave Therapy in Rotator Cuff Calcify Tendinosis - A. Veliaj, G. Mangone, M. Postiglione, P. Pasquetti
- 129 0478 - A new iphone-based goniometer (Drgoniometer): a validation study - G. Ferriero, S. Vercelli, F. Sartorio, E. Brigatti, C. Ruella, D. Primavera
- 129 0479 - Nutritional status in a neurorehabilitation unit: relationship to functional capacity - G. Bovio, D. Bossi, E. Carlisi, L. Ciuffreda, I. Degli Agosti, I. Fontana, A. Landi, A. Magistrone, M. Viggiano, A. Zaliani
- 129 0480 - The role of isokinetic testing into the evaluation of shoulder strength post-mastectomy - A. Russo, M. Delli Bergoli, M.P. Lo Muzio, L. Amoruso, M. A. Mimmo, V. Simone, S. Filoni, V. Rastelli, G. Cassatella, A. Santamato, P. Fiore
- 130 0481 - The effect of inpatient rehabilitation on physical capacity in early period following acute myocardial infarction - A. Ramonas
- 130 0482 - Is it possible a tourism for the severe neurological disabled people? - M. Di Stefano
- 130 0483 - Efficacy of intensive rehabilitative hospitalization in patients with traumatic and non-traumatic severe brain injury - D. Drigo, V. Casasola, C. Olivo, F. E. Pisa, E. Biasutti, T. Giorgini, L. Monti Bragadin, A. Voltazza, P. Di Benedetto
- 130 0484 - The most proper garment in every patient - Michelini S., Moneta G., Failla A., Cardone M., Fiorentino A., Cappellino F.
- 131 0485 - ICF functioning core sets in lymphedema secondary to breast cancer - S. Michelini, M. Cardone, F. Cappellino, A. Fiorentino, A. Failla, G. Moneta, L. Michelotti
- 131 0486 - Treatment by neuroelectrostimulation (FREMS) of the arteriopathy of lower limb: preliminary study - S. Michelini, M. Cardone, L. Michelotti, G. Moneta, A. Fiorentino, F. Cappellino
- 131 0487 - Influence of a preoperative rehabilitation program on hip arthroplasty outcome. Preliminary results - A. Zancan, C. Villani, D. Sparpaglione, B. Bigatti, G. Lorber, G. Bronzini, B. Crosignani
- 131 0489 - Effectiveness of urinary rehabilitation in MS patients - M. L. Lopes de Carvalho, G. Brichetto, R. Motta, M. Causa
- 132 0490 - Influence of mineral sulfide bath on peripheral arterial disease - Z. Damnjanovic, R. Kostic, D. Rondovic
- 132 0491 - A randomized, double-blind, placebo-controlled crossover study using a low frequency magnetic field in the treatment of fatigue in Multiple Sclerosis - M.L. Lopes de Carvalho, R. Motta, G. Konrad, G. Brichetto, M.A. Battaglia
- 132 0492 - Effectiveness of balance disorders rehabilitation treatments in multiple sclerosis subjects: a pilot randomized control trial assessing the wii balance board gaming system - G. Brichetto, P. Spallarossa, M.L. Lopes
- 132 0493 - Post void residual (PVR) evaluation in MS patients - M. L. Lopes de Carvalho, G. Brichetto, R. Motta, M.A. Battaglia
- 133 0494 - Osteopoikilosis: a cause of elevated bone mineral density on dual X-ray absorptiometry measurement in a young woman - A. Kaparow, M. Uludag, H. Sari, Ü. Akarimrak
- 133 0495 - Comprehensive rehabilitation programs may improve some of the ambulatory blood pressure monitoring parameter - M. Iurciuc, C. Avram, S. Iurciuc, A. Vlad, L. Craciun, D. Stancila, D. Gaita, S. Mancas
- 133 0496 - Rehabilitation of critical illness polyneuropathy and myopathy patients - P. Novak, Z. Kuret, G. Vidmar
- 133 0497 - Post-discharge reassessment in stroke patients: can we improve rehabilitation services and patients' quality of life? - S. Fugazzaro, B. Piccinelli, V. Stigliano, S. Testoni, G. B. Camurri
- 134 0498 - Treatment with Botulinum Toxin A for Stump Hyperhidrosis in Amputees - M. Alvarez Sala, R. Sanchez Fernandez, D. Romero Torres, P. Diaz Borrego
- 134 0500 - A new device to measure adherent scar: validity, reliability and sensitivity to change - G. Ferriero, S. Vercelli, L. Salgovic, V. Stissi, F. Sartorio
- 134 0501 - Does educational level affect rehabilitation outcomes after tbi? - S. Di Carlo, L. Cocchini, A. Eskenazi, C. Macchetta, M. Beatrici, A. Fogliato, G. Massazza
- 135 0502 - Management of spasticity in adults in Arcispedale S. Maria Nuova (ASMN) in Reggio Emilia - S. Fugazzaro, S. Testoni, I. Morbilli, I. Caretta, S. Borghi, R. Ferrari, G.B. Camurri
- 135 0503 - Pulmonary postoperative rehabilitation alter lung resection for NSCLC: analysis of feasibility and efficacy - G. Magrone, L. M. Lapenna, M. Maselli, F. Di Bella, M. Morrone, V. Dall'Armi, A. Cesario, P. Granone, S. Sterzi
- 135 0504 - Rehabilitation needs in patients with bone metastases : result of multidisciplinary approach - M. Maselli, L.

- M. Lapenna, F. Di Bella, S. Miccinilli, V. Lauria, A. Tataranno, A. Bica, M. Morrone, A. Listrani, G. Magrone, N. Papapietro, D. Santini, S. Sterzi
- 135** 0505 - The impact of new technologies on the rehabilitation team: the experience of Aria - L. Tosi, G. Nofri, R. Spidaliere, A. Testa, A. Giustini, L. Cavallini, P. Zappalorti, C. Sperandio
- 136** 0506 - Quantitative Analysis of Upper Limb Robotic Therapy in Chronic Stroke - L. Zollo, E. Gallotta, L.M. Lapenna, E. Guglielmelli, S. Sterzi
- 136** 0507 - Cardiopulmonary disability and rehabilitation: an Italian survey - M. Massucci, L. Perrero on behalf scientific section "Cardiopulmonary disability in rehabilitation" of the Italian Society of Physical and Rehabilitation Medicine (SIMFER)
- 136** 0508 - Evaluation of activities and participation of patients with rheumatoid arthritis and identification of influencing environmental factors using ICF - A. Juocevičius, M. Tamulaitienė, I. E. Jamontaitė, Z. Romanovskaja
- 136** 0509 - Quality of life and physical activity in patients with chronic renal failure - I. E. Jamontaitė, L. Aučynienė, T. Palšytė, T. Sinevičius
- 137** 0510 - The mobility relation to person's work-oriented activities after spinal cord injury - A. Cirtautas, I.E. Jamontaitė, J. Bernatavičius, L. Varnienė
- 137** 0512 - A new 14-item scale for measuring dynamic balance: the mini-bestest - F. Franchignoni, M. Godi, A. Nardone, A. Giordano, G. Ferriero, F. Horak
- 137** 0513 - Defining success after upper limb loss - P. Gallagher, S. NiMhurchadha, S. Wegener, M. MacLachlan
- 138** 0517 - Elderly patients with traumatic brain injury: specific considerations of rehabilitation - Z. Denes, P. Cserhati, G. Fazekas
- 138** 0518 - Is there a gender difference in our Cardiac Rehabilitation? - V. Santoro, M. Imbrenda, B. Lombardi
- 138** 0519 - ICF data collection from patients in a rehabilitation unit after severe brain injury - C. Perin, F. Cantù, V. Rega, C. Cerri
- 138** 0520 - Co-morbidity as predictor of functional rehabilitative outcome - R. Semprini, E. Palma, A. Alfano, P. Sale, A. Frustaci, and M. Franceschini
- 139** 0521 - Current stroke rehabilitation approaches are effective on motor recovery and functioning but not on spasticity after stroke: review of 5 RCTS - G. Yavuzer, H. J. Stam
- 139** 0522 - Dramatic Response of the Frozen Shoulder to Acupuncture - K. Homayouni, A. Alipour
- 139** 0523 - Progressive Multiple System Atrophy (MSA): preliminary proposal for rehabilitation - M. Scotti, A. Zancan, E. Morisani, S. Rossi, R. Mauri, I. Springhetti
- 139** 0524 - Effects of upper extremity motor recovery on gait pattern late after stroke - G. Yavuzer
- 139** 0525 - Effects of Hyperbaric Oxygen Therapy (HBOT) on patients with peripheral arterial disease - Z. Damnjanovic, R. Kostic, D. Rondovic, D. Vujnovic
- 140** 0526 - Case report: Using Botulinum toxin in Von Hippel-Lindau - G. Ianieri, R. Marvulli, S. Altini, G. Tondi, L. Mastromauro, M. Ranieri, G. Megna
- 140** 0527 - Predictive value of effect muscle electrostimulation and physiotherapy in the childhood flat foot - M. Ranieri, M. Sciuscio, S. Mennuni, R. Marvulli, A. Camporeale, D. Vittore, G. Megna
- 140** 0528 - Evaluation of the effectiveness of the treatment of the plantar fasciitis and the heel-bone spur with extracorporeal shockwave therapy (ESWT) through baropodometric analysis - A. Zambuto, D. Giglio, G. Pancucci
- 140** 0529 - The ND:YAG laser e its applications in rehabilitation: our clinical experiences - A. Zambuto, D. Giglio, G. Pancucci
- 141** 0530 - The effect of repetitive transcranial magnetic stimulation on chronic stroke patients in regard to brain reorganization, clinical status and electrophysiological parameters - E. Cakar, G. Akyuz, O. Ozyurt, O. Sildiroglu, A. Aytakin, H. Mutlu, C. Ozturk, M. Z. Kiralp
- 141** 0531 - Gait improvement with an orthotic insole in a patient with post-trauma limb-length inequality – case report - S. Paradinha, A. Camões, C. Rito, J. Jacinto
- 141** 0532 - A rehabilitation program for people with fibromyalgia - A. C. Sousa, M. L. Rosado, A. R. Henriques, M. J. Resende, Á. Jesus, M. J. Lalanda
- 141** 0534 - The Correlation between Ultrasonographic Semiquantitative Evaluation on Severity of Knee Osteoarthritis and Clinical Status - L. Chia-Ling, S. Jiing-Yuan, C. Chia-Hsin, C. Tien Wen, H. Mao-Hsiung
- 142** 0535 - Functional evaluation in knee Osteoarthritis - C. Cuenca-González, F. Pascual-Gómez, K. V. Méndez-Saavedra, I. Barca-Fernández, I. Flores-Torres, M. Archanco Olcese, C. Hernández De la Peña
- 142** 0536 - The impact of exercise training on quality of life in hypertensive patients - S. Iurciuc, M. Iurciuc, L. Craciun, C. Avram, A. Avram, G. Gojka, S. Ursoniu, D. Berceanu-Vaduva, D. Gaita, S. Mancas
- 142** 0537 - Orthopaedic surgery and ambulation in boys with Duchenne muscular dystrophy: Five year retrospective review - O. Morozova, T. Duong
- 143** 0538 - Test Results Showing Bench Reliability on Catheter Dislodgement for Ascenda™, Medtronic Neuromodulation's Next-Generation Catheter - K. Hokanson, M. Metzler, J. Kopp, A. Servi, A. Gjoraas
- 143** 0539 - Lymphedema patient management along the life - S. Michelini, A. Failla, G. Moneta, M. Cardone, F. Cappellino, A. Santoro
- 143** 0540 - The utilization of robotic devices in the rehabilitation of arm function after a stroke: analysis of tests with Armeo - V. Leoni, M. L. Calamari
- 143** 0541 - Rehabilitation in cancer patients in a Day Care Centre - M. Zheleva, E. Nikolova
- 143** 0542 - Predictors of treatment outcome in patients with chronic low back pain undergoing spinal manipulation, individual physiotherapy or back school - F. Cecch, S. Negrini, F. Zaina, G. Pasquini, A. Paperini, A. A. Conti, C. Macchi, R. Molino-Lova
- 144** 0543 - Two year follow up of outcomes of conservative treatment package for surgical candidates with lumbar disc herniation - Y. Choi, J. Shin, Y. Youn, S. Lee
- 144** 0544 - Early Rehabilitation in hemiplegic patients - M. Mandić, M. Spalević, N. Rančić
- 144** 0545 - Principles of good clinical practice in thermal rehabilitation - M. De Fabritiis, S. Masiero, S. Mariotti, G. Gigante
- 144** 0546 - Spa and thermal treatments in PRM: The Italian project - M. De Fabritiis, S. Masiero, S. Mariotti, G. Gigante, M. Groppi
- 145** 0547 - The rehabilitation of attention in acquired brain injury patients: Efficacy of the RehaCom® software - A. Redolfi, A. Maietti, S. Galeri, F. Stablum

- 145** 0548 - The benefit of exercise training upon risk factors and subclinical atherosclerosis at hypertensive patients - M. Iurciuc, A. Avram, S. Iurciuc, A. Vlad, G. Ciorica, C. Avram
- 145** 0549 - Effects of a rehabilitation program on prosthesis replacement in lower limb amputees - S. Brunelli, S. Delussu, F. Paradisi, R. De Giorgi, S. Bramucci, V. Grossi, G. Palini, M. Traballese
- 146** 0550 - Effects of administration of rhythmic sound frequencies across a co-vibrating surface: Case report - F. Giubilei, G. A. Lanfaloni, M. Marchionni, M. Menna
- 146** 0551 - Post-stroke neuropathic and nociceptive pain - A.S. Nica, G. Mologhianu, B.I. Mitoiu, A. Murgu, M. Ivascu
- 146** 0552 - Hospital and ambulatory-based cardiovascular rehabilitation programmes in coronary patients with revascularisation procedures - A. Avram, S. Iurciuc, L. Craciun, M. Iurciuc, C. Avram, D. Gaita, S. Mancas
- 146** 0553 - Influence of individual factors in the development of musculoskeletal disorders of the neck amongst medical professionals - B. Rama, A. Murtezani, X. Shkodra, V. Krasniqi, T. Osmani
- 147** 0555 - New technologies to measure hoarseness (Dysphonia) recovery following phonological rehabilitation in a patient with central hemi-laryngeal palsy - M. Mignano, G. Albertini, M. Franceschini, E. Palma, R. Semprini
- 147** 0556 - Study of effect of Robotic therapy on the gait characteristics of Parkinson Disease patients - A.A. Telenkov, A.V. Voronov, A. S. Klochkov, L. A. Chernikova
- 147** 0557 - Use and prescription of powered electronic wheelchairs for patients with severe Acquired Brain Injury (ABI) - D. Saviola, A. De Tanti
- 147** 0558 - Efficacy of intrathecal baclofen delivered by an implanted programmable pump in the treatment of spasticity by acquired brain injury: our experience - M. Tiberti, C. Inglese, A. De Tanti
- 148** 0560 - Poland Syndrome. Use of kinesio taping in improving back pain and numbness of the upper limb - N. Roussos, D. Kalantzopoulos, V. Aggeli, I. Sioutis, A. Farmakides, N. Lykos, D. Patatoukas
- 148** 0561 - Hallervorden-Spatz disease. Improvement in quality of life after injection with Botulinum toxin type A and physiotherapy - N. Roussos, V. Aggeli, I. Sioutis, V. Mitsis, A. Farmakides, N. Lykos, D. Patatoukas
- 148** 0562 - Quality of life in patients with rheumatoid arthritis - V. Mani, V. Aggeli, I. Sioutis, N. Roussos, A. Farmakides, C. Goumas, D. Patatoukas
- 148** 0563 - How does cognitive fatigue modify cognitive performance in multiple sclerosis patients? - A. Morgantini, L. Catena, L. Pierfederici, L. Bacci
- 149** 0564 - Effectiveness of ESWT for patients with plantar fasciitis: follow up at five years - B. Lombardi, M. Imbrenda, I. Spaghetti, F. Troncati
- 149** 0565 - Can intrathecal pumps with blocked catheters be reused? - M. Cirasanambati, J. Mathews, J. Singh, A.B. Ward
- 149** 0566 - Occupational therapy and amyotrophic lateral sclerosis - G. Marcassa, A. Merico, E. Mancini, T. Saoner, A. Marcante, K. Koutsikos, F. Piccione
- 149** 0567 - Therapeutic exercise in Steinert myotonic dystrophy – Case Report - D. Saraceni, M. Salli, C. Foti
- 150** 0568 - Evaluation of extracorporeal shock wave therapy (ESWT) in the treatment of chronic plantar fasciitis - J. Nieto, M. J. Matos, R. Martín, L. Gestoso, L. González, C. Villarino
- 150** 0569 - Quality life: comparison between different rehabilitation settings in multiple sclerosis (MS) patients - A. Morgantini, R. Acito, A. Falappa, L. Bacci, R. Santoni, R. Raspa, L. D'Angelantonio, T. Zaccari, G. Pirani
- 150** 0570 - Pilot analysis of the measurement properties of CRS-R (coma recovery scale-revised): a rasch analysis study - S. Caselli, A. B. Ianes, M. Lino, A. Sighinolfi, M. Breschi, A. D'Avanzo, I. Dine, P. Pacini, A. Fedi, M. Pellegrino, F. Fabiano, F. La Porta
- 150** 0571 - Pilot analysis of the measurement properties of EFA (early functional abilities): a rasch analysis study - M. Lino, S. Caselli, A. B. Ianes, M. Breschi, A. Sighinolfi, A. D'Avanzo, I. Dine, P. Pacini, A. Fedi, L. Perez, A. Puccetti, A. Bracali, E. Bagni, P. Greco, M. Pellegrino, F. La Porta
- 151** 0572 - Pilot analysis of the measurement properties of coma-near coma scale, glasgow coma scale, locfas and disability rating scale: a rasch analysis study - M. Lino, S. Caselli, A. B. Ianes, M. Breschi, A. Sighinolfi, A. D'Avanzo, I. Dine, P. Greco, P. Pacini, A. Fedi, L. Perez, A. Puccetti, A. Bracali, E. Bagni, M. Pellegrino, F. Fabiano, F. La Porta
- 151** 0573 - Pilot analysis of the measurement properties of an item bank for low-awareness patients: a Rasch analysis study - A. B. Ianes, S. Caselli, M. Lino, M. Breschi, A. Sighinolfi, I. Dine, A. M. D'Avanzo, P. Greco, L. Perez, A. Puccetti, A. Bracali, E. Bagni, M. G. Pellegrino, F. Fabiano, F. La Porta
- 151** 0575 - Functional Assessment of Young Adults in Nursing Homes - F. Anwar, A. Al-Khayer, C. Roy
- 151** 0576 - Efficacy of moderate-intensity exercise program for women with fibromyalgia - R. Sgarlata, R. Magri, G. Scaglione
- 152** 0577 - Efficacy of Constraint Induced Movement Therapy for children with Brachial Plexus Palsy - R. Sgarlata, R. Magri, G. Scaglione
- 152** 0578 - Cervical Spine Fractures in Ankylosing Spondylitis - F. Anwar, A. Al-Khayer, M. Fraser
- 152** 0579 - Effects of a weight-bearing exercise training on bone mineral density and neuromuscular function of osteopenic women - D. Marchese, M. D' Andrea, V. Ventura, T. Montalcini, D. Foti, A. Pujia, E. Gulletta, M. Iocco
- 152** 0580 - Re-education based on midline trunk perception in chronic low back pain: a single blind controlled trial - T. Paolucci, E. Spadini, A. Fusco, M. Iosa, G. Morone, R. Alcuri, S. Paolucci, V.M. Saraceni
- 153** 0581 - Rehabilitation of cancer breast patients after surgery: disability and health-related quality of life - T. Paolucci, R. Alcuri, A. Scappaticci, G. Fratocchi, C. Tirelli, V. Santilli, V. M. Saraceni
- 153** 0582 - The Post-graduate Medical Schools in Physical and Rehabilitation Medicine. Present situation in Italy - Postiglione M, Sirico F, Tucci L, Fusco A
- 153** 0583 - Bone turnover markers and bone mineral density after Parathyroid Hormone treatment in women with osteoporosis - I. Doya Barca-Fernandez, C. Cuenca, K. Mendez, R. Vacas, F. Pascual
- 153** 0584 - Results of a program of complex physical therapy and our domiciliary guidelines in patients with Lymphedema - I. Barca- Fdez, L. Garcia, L. Platas, S. Gonzalez, C. Hernandez, P. Diaz, F. Pascual
- 154** 0585 - Stress Ulcers: Management and Outcome in Spinal Injuries Unit - F. Anwar, M. Purcell
- 154** 0586 - Cervical Spine Fractures in Ankylosing Spondylitis - F. Anwar, A. Al-Khayer, M. Fraser

- 154 0587 - Inpatient rehabilitation in hemophilic patients after major orthopaedic surgery: characteristics and management - G. Zambelan, T. Viliani, M. Innocenti, M. Morfini, P. Pasquetti
- 154 0588 - High Intensity Laser Therapy (HILT) in Knee Osteoarthritis patients: preliminary results - C. Martini, T. Viliani, M. Monici, P. Pasquetti
- 155 0589 - Bilateral patellar tendon rupture in a patient with pioderma gangrenosum: a case report and review of the literature - R. Fiorillo, A. Garcia-Cruz, C. Fernandez-Caamaño, M. V. Lourido-Estevez, M. L. Rey-Pita
- 155 0590 - Comparison of physical therapy modalities and neuromuscular electrical stimulation (NMES) on hemiplegic upper limb rehabilitation - F. Baygutalp, K. Şenel
- 155 0591 - Study Hallux adductor muscle as a functional disorder in morton's. metatarsalgia - M. Ranieri, A. M. Cortese, S. Mennuni, G. Ianieri, R. Marvulli, G. Gioia, D. Vittore, G. Megna
- 156 0592 - Amelioration of visual extinction in a patient with right-hemisphere damage after left hemisphere bleeding: implication for rehabilitation - V. Varalta, N. Smania, C. Marzi, E. Natale
- 156 0593 - Caudal Regression Syndrome, Four Cases - C. de Miguel Benadiba, M. Hernandez Manada, A. Gil Agudo
- 156 0594 - Primary Rehabilitation of Spinal Cord Injuries: Our experience - E. Skikic-Mujic, S. Ullattuthodiyil, M.T. Tolin, S. Chandwani, S. Trebinjac, G. Devcerski
- 156 0595 - Hip Pathology in Obstetric Brachial Palsy - R. Sánchez Fernández, A. Lagares Alonso, J. A. Conejero Casares
- 157 0596 - Treatment outcome evaluation in children with dysfunctional voiding - V. Zivkovic, M. Lazovic, M. Vljakovic, A. Slavkovic
- 157 0597 - Quantitative Effects On Gait Pattern Of Repeated Muscle Vibrations: A 5-Yr-Old Case Study - F. Camerota, E. Galli, S. Vimercati, V. Cimolin, N. Tenore, G. M. Filippi, C. Celletti, G. Albertini
- 157 0598 - Pain in post-surgical orthopedic rehabilitation: designing and testing a protocol for a multicenter study - F. Cecchi, C. Pazzaglia, L. Chiavacci, R. Molino-Lova, L. Padua
- 157 0599 - Low back pain ICF Core Set validation study - C.E. Fata, M. Iocco
- 158 0600 - The importance of balneotherapy in the rehabilitation of patients with ankylosing spondylitis - M.D. Pavlović, N. S. Prodanović, M. P. Čukanovic
- 158 0601 - Individualized exercise training benefit on hemodynamic parameters in young metabolic syndrome patients - C. Avram, M. Oraviţan, A. Nagel, M. Barzu, B. Almajan-Guta, L. Crăciun, C. A. Avram
- 158 0602 - PRM trainees training in France "European Lecture – PRM trainees Session" - Lotito G, Collado H
- 158 0603 - The effects of rehabilitation treatment in improving the quality of life of patients with neurological manifestations of hiv infection - A. Jovanovic, M. Grajic, M. Manojlovic Opacic, J. Potic, V. Vesovic Potic
- 159 0604 - Clinical-thermographic analysis in ankle sprains - S. González Burgos, L. Platas Gabriel, L. García Delgado, C. Hernández de la Peña
- 159 0605 - Effects of different upper limb robot-aided approaches in chronic hemiparetic patients - S. Mazzoleni, R. Crecchi, M. C. Carrozza, F. Posteraro
- 159 0606 - Current evidence for the effectiveness of interventions to treat the subacromial impingement syndrome.
- Part III: Electro Shock-Wave Therapy B - MA Huisstede, L. Gebremariam, R. van der Sande, E. M Hay, B. W Koes
- 159 0608 - Effectiveness of interventions of specific complaints of the arm, neck and/or shoulder (CANS): Three musculoskeletal disorders of the hand. An update - B. M. Huisstede, M. van Middelkoop, M. S. Randsdorp, S. Glerum, B. W. Koes
- 160 0610 - Endurance and surface electromyography power frequency analysis of paraspinal muscles in patients with chronic low back pain undergoing exercise program - S. Yildiz, F. Soyupek, S. Bilgin, H. Koyuncuoglu
- 160 0612 - Effect of lesion site on the reinforcement learning in virtual reality: a study on post-stroke patient - A. Turolla, A. Boscolo, M. Agostini, P. Kiper, A. Vendramin, L. Piron
- 160 0613 - Changes in locomotors functioning after a combined training with Gait Trainer and dynamic orthosis in patients affected by cerebral palsy (PCI): a pilot study - A. Cosentino, B. Montagnana, P. Bonetti, A. Vangelista, M. Recalcati, F. Pinto, M. Bendinelli, N. Smania, A. Fiaschi
- 161 0615 - Cognitive impairment in hip fractured patients - F. Gimigliano, G. Iolascon, G. Del Gaudio, V. Pipolo, S. Tartaglia, R. Gimigliano
- 161 0616 - Lower limb Lymphedema and Health Related Quality of Life in patients with melanoma metastatic to inguinal lymph nodes: a perspective cohort study - M. Pinto, F. Gimigliano, C. Caracò, G. Iolascon, G. Di Pietro, U. Marone, F. Iazzetta, S. Piscopo, R. Gimigliano
- 161 0617 - Functional limitation of the shoulder and Quality of Life in cancer patients following neck dissection surgery - M. Pinto, F. Gimigliano, F. Ionna, G. Iolascon, C. Aversa, P. De Blasis, M. Scognamiglio, R. Gimigliano
- 161 0618 - Validity of FRAX in orthopaedic and rehabilitative settings: an Italian people-based survey - G. Iolascon, F. Gimigliano, M. Gioia, R. Napolano, A. Tirelli, R. Gimigliano
- 161 0619 - Efficacy of manipulation-mobilization therapy on pain, function and quality of life in patients with adhesive capsulitis - O. Seyyah, B. Erhan, B. Gunduz, M. Yelkovan, A. Bardak, F. Savas, H. B. Secil
- 162 0620 - Intra-articular distension and steroids in the management of hemiplegic shoulder: A randomized controlled Trial - A. Doğan, R. Demirtaş, N. Özgirgin
- 162 0621 - Ankle arthroplasty in haemophilic arthropathy. A care network for rehabilitation - P. Martinez, S. Franz, R. Tramontozzi, M. De Pedis, A. Selvanetti, A. Antonaci
- 162 0622 - Establishment of multidisciplinary pain clinic in physical medicine & rehabilitation department (report of an experience and review of cases) - S. M. Rayegani, A.S. Seddighi, M.H. Bahrami, D. Elyaspoor, M.R. Tarraghi, I. Sedighipoor
- 163 0623 - Effectiveness of rehabilitation programe following hip arthroplasty - D. Matei, R. Traistaru, R. Popescu, A. Bighea, D. Dragoi
- 163 0624 - Predictive factors of disease activity evolution in rheumatoid arthritis patients - D. Matei, R. Traistaru, R. Popescu, A. Bighea, D. Dragoi, A. M. Bumbea
- 163 0625 - Lack of vitamin D as cause of vertebral fractures – Case Report - S. Amorim, H. Lopes, A. Amado, L. Dias
- 163 0626 - A study on Clinical grading of Osteoarthritis of the knee joint & its correlation with radiological grading - M. Habibur Rahman
- 163 0627 - Knee Osteoarthritis patients treated with intra-articular hyaluronic acid (Jointex): functional and postural outcomes - A. Magrini, T. Viliani, G. Mangone, E. Pratelli, P. Pasquetti

- 164 0628 - Outpatient home-based rehabilitation program after total knee arthroplasty - T. R. Fernández, M. Valdés, J. Molins, R. San Segundo, E. Calero, S. Ródenas
- 164 0629 - UFRJ's eInclusion program – Pilot group profile - D. R. Xerez, L. Barroso, Y. S. V. Carvalho, B. L. Cardoso, J. A. Borges
- 164 0630 - Complications of geriatric rehabilitation - J. Krajnov, G. Devečerski, B. Novakovic, A. Knezevic, S. Pantelinac
- 164 0631 - Prevalence of Dysphagia in Parkinson disease: a potentially underestimated dangerous condition - A. Giusti, M. Giambuzzi, P. Da Rin Della Mora, M. Simonini, P. Tognetti, L. Baratto
- 165 0632 - Diagnosis of Neurogenic TOS, Proximal brachial plexus latency difference by magnetic stimulation, a preliminary study - G. Reza Raissi, T. Ahadi, B. Forough
- 165 0633 - Valorization of the rehabilitation after cerebrovascular insult by et test - E. Tanovic, H. Tanovic
- 165 0634 - Forestier's disease and stroke: differential diagnosis of dysphagia - Montesinos-Magraner LL, Velasco-Zarzuelo M, Ruiz-Eizmendi A, Herrero Iscar T.
- 165 0635 - Case report: udd's myopathy in a spanish patient - L. C. Garrote-Moreno, E. Pellicer-Fernández, M. J. López-García, C. Corrochano-García, J. V. Lozano-Guadalajara, E. A. Sevilla-Hernández, R. López-Lozano, M. A. Giménez-Abadía
- 166 0636 - Botulinum Toxin: A Refinement in the Management of Facial Nerve Palsy Sequelae - V. Roque, R. Nascimento, V. Machado, F. Parada, M. J. Festas
- 166 0637 - Incomplete spinal cord injury and use of Botulinum toxin in reducing spasticity and improving gait - L. L. Montesinos-Magraner, C. Martinez-Garre, L. Ramirez-Garceran, S. Rodríguez-González, I BorideFortuny
- 166 0638 - Botulinum Toxin Type A Injections for Management of Spasticity in Children with Cerebral Palsy – Where are We Now? - V. Roque, V. Machado, I. Festas, F. Parada
- 167 0639 - Evolution of dysphagia in stroke patients after swallowing rehabilitation - L. Bubbico, V. D'Annunzio, I. Aprile, E. Moore, L. Padua
- 167 0640 - Botulin toxin-type A (BONT-A) in congenital facial palsy: a case report - D. R. Xerez, L. Barroso, Y. S. V. Carvalho, P. G. O. Rocha
- 167 0641 - Patients with spina bifida and bladder cancer. Our experience - E. Pagès, L. L. Montesinos, M. Meléndez, S. Rodríguez, A. Cuxart
- 167 0642 - Peripheral Nerve Blocks in Spasticity Treatment - V. Roque, M. Agre, M. J. Festas, F. Parada
- 168 0643 - Static and dynamic balance modifications after treatment of focal spasticity with Botulinum toxin - E. Cosentino, M. Tiozzo, F. Piccione, A. Merico, P. Tonin
- 168 0644 - Therapeutic possibilities for complaints of arm, neck and shoulder to office workers - A. Totorean, A. Nita, C. Cristea, R. Onofrei, R. Dragoi
- 168 0645 - Outcomes after a complex rehabilitation program in patients with knee osteoarthritis – preliminary results - A. Totorean, R. Onofrei, D. V. Poenaru, D. Nemes, A. Nita, C. Cristea
- 168 0646 - The quality of life after in patients with total hip replacement after aquatic exercises - A. Totorean, C. Cristea, R. Onofrei, A. Nita, R. Dragoi
- 169 0647 - Clinical and Functional outcomes after knee replacement - A. Totorean, D. V. Poenaru, R. Onofrei, A. Niță, C. Cristea, B. Andor, J.M. Patrascu
- 169 0648 - Adherence to neck/back care in Activities of Daily Living: relevance of previous experiences and selfmanagement habits - P. Escolar-Reina, F. Medina-Mirapeix, J.J. Gascón-Cánovas, J. Montilla-Herrador, S.L. Oliveira-Sousa, E. Navarro-Pujalte
- 169 0649 - Development of a patient self-report questionnaire on continuity of care in hospital acute care - S.L. Oliveira-Sousa, F. Medina-Mirapeix, P. Escolar-Reina, J. Montilla-Herrador, E. Navarro-Pujalte, M. Sobral-Ferreira
- 169 0650 - Searching factor structure of ICF-categories underlying to sub-domain 'Changing and maintaining body position' - F. Medina-Mirapeix, E. Navarro-Pujalte, M. E. Del Baño-Aledo, F.J. Jimeno-Serrano, P. Escolar-Reina, J. Montilla-Herrador
- 170 0651 - How does the selection and management of home exercise program for neck and low back pain patients influence their adherence - P. Escolar-Reina, F. Medina-Mirapeix, J. Montilla-Herrador, S. L. Oliveira-Sousa, M. E. Del Baño-Aledo, F. J. Jimeno-Serrano
- 170 0652 - Patients' perceptions about management care implied in rehabilitation care - S.L. Oliveira-Sousa, F. Medina-Mirapeix, P. Escolar-Reina, E. Navarro-Pujalte, M. E. Del Baño-Aledo, M. Sobral-Ferreira
- 170 0654 - Evaluation of late hemiplegic foot dorsiflexion using motor imagery: a case report - P.G.O. Rocha, D.R. Xerez, H.L.C. Neto, V. R. Portella, M.M. Gomes
- 170 0655 - Stroke as the first manifestation of Fibromuscular Dysplasia – Case report - J. Macedo, S. Magalhães, H.R. Costa, A.P. Camelo
- 171 0656 - Hemiparesis: Stroke or Conversion Disorder? Two case reports - J. Macedo, S. Magalhães, S. Toste, S. Amorim, A. Trêpa
- 171 0657 - Urinary incontinence – Did pelvic muscles exercises do at home result? - J. Macedo, S. Magalhães, S. Amorim, A. Trêpa
- 171 0658 - Spondylotic cervical myelopathy – Conservative versus Surgical treatment - M. João Andrade, J. Macedo, S. Magalhães, M. Miguel Ribeiro
- 171 0659 - Does Behcet's disease associate with neuropathic pain syndrome and impaired well-being ? - S. Koldas Dogan, S. AY, D. Evcik N. Cuzdan, M. Guven, A. Gurler, A. Boyvat
- 172 0660 - The effectiveness of ultrasound therapy in the treatment of carpal tunnel syndrome: randomised doubleblinded placebo controlled study - S. Koldas Dogan, S. Ay, D. Evcik
- 172 0661 - The effectiveness of low laser therapy in subacromial impingement syndrome: a randomized placebo controlled double-blind prospective study - S. Koldas Dogan, S. Ay, D. Evcik
- 172 0662 - The effectiveness of biofeedback assisted isometric exercises in knee Osteoarthritis - S. Koldas Dogan, S. AY, D. Evcik
- 172 0663 - The neuropathic pain syndrome and sleep quality in Osteoarthritis S. Koldas Dogan, - S. AY, D. eniz Evcik
- 172 0664 - Efficacy of Clodronate in Complex Regional Pain Syndrome (Shoulder-Hand Syndrome) post stroke - A. Tuzzi, C. Baiano, A. Romeo, M. Chierchia, G. R. Schirò, R. Russo
- 173 0665 - Chronic low back pain after conservative treatment of lumbar disc herniation - E. Nikolik-Dimitrova
- 173 0666 - Dopaminergic vs. GABAergic modulation of human motor cortex plasticity – a transcranial magnetic stimulation study - N.V. Ilic, E. Dubljanin-Raspovic, S. Varagic-Markovic, U. Nedeljkovic, N. Krstic, S. Tomanovic, V. Vesovic-Potic, T.V. Ilic

- 173** 0667 - Correlation between muscle thickness and muscle strength – a new method to measure muscle strength using musculoskeletal ultrasound?! - E. M. Strasser, T. Draskovits, E. Grundböck, M. Quittan (Austria)
- 174** 0668 - Effectiveness of teriparatide in osteoporotic women - S. López-F, P. Peret, E. Barnola
- 174** 0669 - Improvement walking in chronic stroke patients with a dropped foot after functional electric stimulation - V. Santoro, J. Grasso, S. Moretti, B. Lombardi, F. D'Ambrosio, G. Censi, A. Fiè, V. G. Bombace, O. Mercante
- 174** 0670 - Efficacy of ultrasound guided Botulinum Toxin (BT) injection for the treatment of hip flexor spasticity in spinal cord injured (SCI) patient - Case study - N. Barotsis, D. Psillaki, V. Tragoulias, T. Georgiadis, C. Gartzios, N. Groumas, P. Kosmidis, M. Domazou, K. Kalokairinou, P. Papadaki
- 174** 0671 - Neurophysiological evaluation of respiratory disorders in Chronic Inflammatory Demyelinating Polyradiculoneuropathy (CIDP) – case study - N. Barotsis, D. Psillaki, N. Ananidis, S. Papakosta, G. Stamatakis, N. Groumas
- 175** 0672 - Are intrathecal baclofen (ITB) trials performed with an in-situ catheter either by continuous infusion or multiple boluses in a rehabilitation ward setting safe and effective? - B.S. Mayilvaganan, M. Cirasanambati, J. Matthews, A.K. Ball, A.B. Ward
- 175** 0675 - Effectiveness of Motor Imagery Training integrated with a rehabilitation strategy in Parkinson's disease - G. Censi, V. Battistelli, S. Castelli, M. Guidi, O. Mercante
- 175** 0677 - Longterm efficacy of prolonged integrated rehabilitation therapy in PD patients - M. Guidi*, S. Castelli, V. Battistelli, G. Censi, O. Mercante
- 175** 0679 - Comparative study of the external compartment knee osteoarthritis treatment: with isokinetic/isometric dynamometric system Vs traditional kinesitherapy - G. G. Ghetti, O. Mercante, R. Ansevini, V. Bombace, F. D'Ambrosio, L. Fiè, A. Costantini
- 176** 0681 - Correlations between ICF Stroke Brief Core Set items and other clinical evaluations in patients with ictus cerebri - O. Mercante, V. G. Bombace, F. D'Ambrosio, A. Fiè
- 176** 0683 - Analysis of the quality of life by Womac scale in the treatment of knee osteoarthritis with intraarticular hyaluronic acid - M. V. Lourido Estévez, C. Fernández Caamaño, R. Fiorillo, J. Flores Calvete, L. Rey Pita, M. Barberá Loustaunau
- 176** 0685 - Acute Spinal Cord Injury and Framingham - L. Ortiz Fernández, R. Natividad Andres, N. Cívicos Sánchez, M.L. Jauregui Abrisqueta, A. Madariaga Zabala, M.P. Abaitua Ezquerria, A. Alava Menica, T. Torralba Puebla
- 176** 0686 - Reliability and validity of the turkish version of the short physical performance battery - Y. Dalgi, B. Doğu, F. Sahin, T. Ercalik, B. Kuran, S. Gursakal
- 177** 0688 - Agreement in rating of pain intensity and overall well-being between parents and children with juvenile idiopathic arthritis - N. Djurovic, G. Susic, R. Stojanovic, I. Petronic, M. Terek, S. Pavlov
- 177** 0689 - The accuracy of prediction of functional outcome in severe acquired brain injury. a one year analysis in our rehabilitation unit - S. Bargellesi, A. Bazzana, P. Boldrini
- 177** 0690 - Rehabilitation program in patients with knee osteoarthritis - C. Cuenca-González, F. Pascual-Gómez, K.V. Méndez-Saavedra, I. Barca-Fernández, I. Flores-Torres, A. Herranz-Torrubiano.
- 177** 0691 - Case study of patients attended in a rehabilitation polyclinic - Méndez-Saavedra KV, Barca-Fernández I, Cuenca-González C, Flores-Torres I.
- 178** 0692 - Cardiac Rehabilitation: Is Ischemia Really Important? - M. M. Ribeiro, H. Reis Costa, S. Marques, H. Castro, P. Fernandes, S. Gonçalves Viamonte
- 178** 0693 - The Evaluation of The Effects of Therapeutic Exercise On Lumbar And Pelvic Pain In Pregnant Women of Isfahan City - Sayed Mohsen Mirbod, Fateme Mortazi, Mariam Zarin Moghadam
- 178** 0694 - Osteoporosis in stroke patients - M. Domazou, P. Kosmidis, K. Kalokairinou, E. Drakonaki, M. Riga, E. Feskou, V. Mani, P. Papadaki.
- 179** 0695 - Cortical and trabecular bone density of the forearm in stroke patients with Complex regional pain syndrome type I - Á. Domazou, P. Ósmidis, K. Alokairinou, E. Drakonaki, Ö. Barotsis, N. Ananidis, N. Groumas, P. Papadaki.
- 179** 0696 - An observational study of prevalence of osteoporosis in a group of young adults affected by severe developmental disabilities - C. Durante, M. Gasparini, P. Giovanzana, G. Masserano, M. Montanaro, G. Poggi, R. Tiepolo, L. Rusca, S. Braga
- 179** 0697 - Long-term follow-up of surgical correction for equinovarus foot deformity in adult stroke patients. A gaitanalysis based study - S. Carda, M. D'Innocenzio, A. Vannicola, M. Invernizzi, M. Zaccala, A. Florio, C. Cisari
- 179** 0698 - Effect of fesoterodine on urodynamic parameters and quality of life in patients with spinal cord injury - M. Moharić
- 180** 0699 - Quality of life in older patients with femoral fracture undergoing rehabilitation treatment - I. Gallo, M. Serrao, F. Papalia, M. Ferrari, E. Marchi, W. Silvestri, M.T. Stancati, K. Girolami, P. Marino, S. Monami
- 180** 0700 - Behavioural and Cognitive Functioning after Traumatic Brain Injury - F. Tebaldi, F. Stablum, A. Cantagallo
- 180** 0701 - Gait training on Lokohelp after stroke: analysis of the benefits in chronic patients - S. Chiari, L. Bissolotti, C. Calabretto, M. Gobbo, E. Baruzzi, P. Gaffurini, C. Orizio
- 180** 0702 - Functional and kinematic evaluation of athletes with spinal pain syndromes by a new two optoelectronic cameras system - S. Chiari, L. Bissolotti, M. Ometto, C. Calabretto, M. Gobbo, D. Lussignoli, E. Baruzzi, P. Gaffurini, C. Orizio
- 181** 0703 - Inter-operator reliability of a complete physical examination for low back pain and sciatica - G. Brugnani
- 181** 0704 - Correlation of recreational physical activity and sports activity in serbian school children - D. Nikolic, I. Petronic, D. Cirovic, Z. Milincic, S. Simeunovic, I. Novakovic, S. Nedeljkovic, M. Vukotic
- 181** 0705 - Hydrotherapy for management of spasticity in Primary Lateral Sclerosis (PLS) - D. De Cicco, P. Volanti
- 181** 0706 - Vitamin D and Osteoporosis: correlation in Multiple Sclerosis patient - G. Guarcello, G.T. Maniscalco, V. Baldassarre, C. Florio, M. Costa
- 182** 0707 - Evaluation of rehabilitation outcome in hip fracture patients - G. Guarcello, V. Baldassarre, P. Monteleone, I. Quarto, M. Sollo, G. Terzolo, M. Costa
- 182** 0708 - Effect of hydrotherapy in the rehabilitative treatment of Multiple Sclerosis (MS) - P. Volanti, Scialabba G., D. De Cicco
- 182** 0709 - Osteogenesis Imperfecta – Importance of the Rehabilitation Program - A. Murgu, G. Mologhianu, A. Ionescu, A. Nica

- 182 0710 - Cerebrovascular impairments resulting in Electric Powered Indoor/outdoor Wheelchair (EPIOC) Provision in North West London - A.O. Frank
- 183 0711 - Experimental evaluation by gait analysis of a new type of flexible back brace in two cases of dystrophy - C. Smiderle, M. Scapin, S. Zacquini, E. Biotto, D. Pigatto
- 183 0712 - Gait analysis of the changes induced by the use of different braces in a girl affected by PCI - M. Scapin, C. Smiderle, D. Pigatto, S. Zacquini, E. Biotto
- 183 0713 - Sports and airway clearance techniques in children with cystic fibrosis - B. Almajan-Guta, V. Almajan-Guta, C. Avram
- 183 0714 - Effects of physical activity on body mass index values in young adults of mladenovac - V. Maric, N. Radosavljevic, H. Colovic, M. Lazovic
- 183 0715 - A diagnosis to remember - C. Bianchi, A. Betto, A. Pastorino, C. Stradella, G. Rovere
- 183 0716 - The "VIBORA" Study: Muscle Training using High Frequency Mechanical Vibrations as an Adjuvant in the Rehabilitation of Patients with Chronic Obstructive Pulmonary Disease (COPD) - A. Morales, E. Marco, A. Ramírez-Sarmiento, J.M. Martínez-Llorens, M. P. Ausin, R. Boza, A. Guillen, M. Orozco-Levi
- 184 0717 - Evolutif profile after proximal femur fracture in old subjects - A. Souayah, S. Ben salah, W. Herchi, H. Rahali, I. Miri, S. Ghorbel, S. Lebib, C. Dziri
- 184 0718 - Psychological profile of the chronic low back pain before and after rehabilitation program - A. Souayah, W. Herchi, H. Rahali, I. Miri, S. Ghorbel, S. Lebib, C. Dziri
- 184 0719 - Comparison of two instrumental muscle strength measurement methods in the lower extremity in children with CP - M. Bonikowski, A. Czernuszenko, J. Jagiello, E. Zak
- 184 0720 - Case report: The effects of auditory rhythms in a patient with persisting gait disorder six months post brain injury - S. L. Rossetti, K. Molatore, C. Foti
- 185 0721 - Paravertebral infiltrations or physical analgesia for treatment of peripheral neuropathic pain: from disconnection to combination - Iveta B. Koleva, Radoslav D. Yoshinov
- 185 0722 - Medical rehabilitation and occupational (ergo) therapy - an adjuvant medical specialty under the supervision of PRM doctors: the Bulgarian way - I. B Koleva, T. Troev, R. D Yoshinov
- 185 0723 - Rehabilitative approach to the 'dropped head syndrome' in ALS - C. Berlingieri, S Lampa, G. Marcassa, F. Piccione, E. Cosentino, A. Merico
- 185 0725 - Paravertebral infiltrations or physical analgesia for treatment of peripheral neuropathic pain: from disconnection to combination - I.B. Koleva, R.D. Yoshinov
- 186 0726 - Body fatness influence on treatment effects in patients with subacute low back pain - M. Terek, M. Zlatkovic-Svenda, N. Djurovic, G. Radunovic
- 186 0727 - The Evaluation of The Effects of Therapeutic Exercise On Lumbar And Pelvic Pain In Pregnant Women of Isfahan City - S. M. Mirbod, F. Mortazi, M.Z. Moghadam
- 186 0728 - The evaluation of the effectiveness of educational booklet on reduction of neck pain among dentists of Isfahan - A. Karimi, S. Jokar, H. Kamaledini, F. Mozafari
- 186 0729 - Cardio-vascular functions and physical endurance - Lazovic Milica
- 187 0730 - The lateral fracture of femur, news in the field of rehabilitation: our experience - G. E. Fata, L. Di Bisceglie, G. Di Bisceglie
- 187 0731 - Icars project: Italy –Jordan cooperation in rehabilitation sciences - G. Della Bella, T. Sciarra, C. Foti
- 187 0732 - Perceived disadvantage caused by lower back pain - K. Mattila, M. Leino, C. Suominen, R. Tuominen
- 187 0733 - Effects of FES Cycling in the Late Recovery of Chronic Patients with Spinal Cor Injury - E. Yasar, B. Yilmaz, A.S. Goktepe
- 188 0734 - Nosocomial Urinary Tract Infections in A Neurologic Rehabilitation Center - B. Yilmaz, F. Yavuz, E. Yasar
- 188 0735 - Gait and Energy Expenditure Analysis in Decision about Using WalkAide System in a Stroke Patient - R. Alaca, B. Balaban, E. Yasar
- 188 0736 - Follow-up of breast cancer patients after negative sentinel node biopsy - H. Fernandes, C. Neri, P. Silva, Â. Rodrigues, J. Abreu de Sousa, O. Romano
- 188 0737 - Psychometric characteristics of duruoz hand index in patients with traumatic hand injuries - E. Tülay, Ş. Füsün, E. Cem, D. Beril, Y. Serap, K. Banu
- 189 0738 - Musictherapy and Parkinson's disease - A. De Serio, D. Forenza, G. Megna
- 189 0739 - Pulmonary rehabilitation: which cardiovascular evaluation previous to a pulmonary rehabilitation program? - S. Marques, M. Miguel Ribeiro, M. Joao Miranda
- 189 0740 - Characterizing a Portuguese lower limb amputee population - I. Machado Vaz, V. Roque, S. Pimentel, H. Duro
- 189 0741 - Short term effectiveness of ultrasound therapy in knee osteoarthritis - F. Tascioglu, S. Kuzgun, O. Armagan, G. Ogutluler
- 190 0742 - Treatment of carpal tunnel syndrome with low level laser: Clinical, ultrasonographical and electrophysiological assessment - F. Tascioglu, N. Akcar Degirmenci, S. Ozkan, O. Mehmetoglu
- 190 0744 - Therapeutic potential of different modes of exercise in type 2 diabetes - W. Geidl, K. Pfeifer
- 190 0745 - Chronic low back pain, depression and functional impairment: a correlation study - A. Montez, P. Figueiredo, J. Páscoa Pinheiro, M. Quartilho, J. Branco
- 190 0746 - Dynamic Elbow Supination Brace to Correct Elbow Contracture - K.U. Jang, J.S. Choi, J.Y. Lee, J.H. Mun, C.H. Seo
- 191 0747 - Evaluation of the hands function in Charcot-Marie-Tooth patients by sensory-engineered gloves - M. Monti Bragadin, M. Grandis, L. Reni, E. Bellone, S. Porohkina, M. Grosso, A. Tacchino, G. Abbruzzese, G. Maggi, M. Bove, A. Schenone
- 191 0748 - Efficacy of extracorporeal shock wave therapy for the treatment of spasticity in Cerebral Palsy: a pilot study - V. Gasparroni, C. D'Agostino, A. M. Lopez Lopez, C. Pisciotta, S. Respizzi, B. Bernardini, N. M. Portinaro
- 191 0749 - Evaluation of long-term use of a static hand-wrist orthosis in patients after chronic stroke - J. W. G. Meijer, D. van Grinsven, J. Fassaert, G. Jordan, R. Blok, A. Andringa
- 192 0750 - Effects of application of 0, 485MHz radio-frequency through the use of a capacitive-resistive energy transfer on the muscle tissue using a double-blind crossover study - M. Tofanicchio, C. Tranquilli, G. Annino, M. Hawamdeh, L. Giordani, G. Della Bella, B. Contini, E. Fanucci, Bernardini, C. Foti

- 192 0751 - Ultrasound findings and the efficiency of physical therapy with patients suffering from knee sprain - S. Muraja, B. Markulinčić
- 192 0752 - Effects of reduced lumbar load by the use of a vertical traction device on dynamic subjects - P. Balthazard, D. Goldman, E. Staderini, G. Gigante, S. Gentili, S. Mugnaini
- 192 0753 - Multidisciplinary team experience regarding rehabilitation of hand traumatic pathology, based on case presentations - C. M. Brailescu, R. G. Scarlet, A. Murgu, A. S. Nica, G. Mologhianu, I. Lascar
- 193 0754 - Evidence-based results of using Rehabilitation program for neurological sequelae after traumatic injuries of the hand - C. M. Brailescu, R. G. Scarlet, A. S. Nica, A. Murgu, G. Mologhianu, I. Lascar
- 193 0755 - The importance of ergotherapy in rehabilitation of the soft-tissues sequelae after hand traumatic injuries - C.M. Brailescu, R. G. Scarlet, A. Murgu, G. Mologhianu, A. S. Nica, I. Lascar
- 193 0756 - Rehabilitation program after brachial plexus traumatic pathology, evidence-based study - C. M Brailescu, R. G. Scarlet, G. Mologhianu, A. S. Nica, A. Murgu, I. Lascar
- 193 0757 - Benefits of hand rehabilitation program and ergotherapy after carpal tunnel release - C. Brailescu, R. G. Scarlet, A. S. Nica, G. Mologhianu, A. Murgu
- 194 0758 - Traditional and modern concepts about hand prosthesis - C. M. Brailescu, R. G. Scarlet, A. S. Nica, G. Mologhianu, A. Murgu, I. Lascar
- 194 0759 - Study regarding the use of ergotherapy in Geriatric Rehabilitation - C. M. Brailescu, R. G. Scarlet, G. Mologhianu, A. Murgu, A. S. Nica
- 194 0760 - Skin microvascular blood flow during walking using lower body positive air pressure - H. Kuroki, Y. Torii, K. Tsuchimoto, H. Inoue, M. K. Miura, R. Kakinoki, H. Ieki, T. Morinaga, M. Kobayashi, Y. Nakagawa, M. Nankaku, T. Nakamura
- 195 0761 - Lung transplantation: bone mass loss at risk? - M. Ribeiro da Cunha, L. Diamantino
- 195 0762 - Bilateral brachial plexopathy while walking in the Camino de Santiago - R. Fiorillo, C. Fernandez-Caamaño, V. Lourido-Estevez, J. Muñoz-Mateo
- 195 0763 - Ulnar entrapment neuropathy treatment: sonographic and clinical evaluation - S. Popescu, D. Cinteza, D. Poenaru, M. Sidere, G. Galbeaza, V. Marcu, S. Diaconescu, A. Dima, A. Tudosie
- 195 0764 - Functional electrical stimulation to enhance walking abilities - F. Molteni, E. Guanziroli, M. Colombo, G. Togni, C. Gramigna
- 196 0765 - Clinical and Instrumental Seating Evaluation in Patients with Major Disabilities: a pilot study - M. Colombo, D. Biacchi, F. Molteni, E. Guanziroli, M. Pascoli
- 196 0766 - Acceptance of SPL KAFO in patients with Post Polio Syndrome - M. Franco, M. Rossini, E. Guanziroli, L. Magoni, D. Biacchi
- 196 0767 - Determining Changes and Structural Malalignment in the Spine of Trans-Femoral Amputees Using Prosthesis - H. Assiabi, S. Goharpey, K. Navid Taheri (MSc PT)
- 196 0768 - Is the treatment of muscle-skeletal support swallowing structures useful to facilitate rehabilitation of neurogenic dysphagia? - L. Crescini, L. Medici, F. Noro, A. Testa, S. Galeri
- 197 0770 - Effectiveness of exercise therapy in hip osteoarthritis: a pragmatic randomized controlled trial
- R. Juhakoski, - S. Tenhonen, A. Malmivaara, V. Kiviniemi, T. Anttonen, J.P.A. Arokoski
- 197 0771 - The relevance of presurgical and early rehabilitation education to improve the outcome in hip replacement - J. Sanchez Raya, E. Pagés, A. M. L. Espitia
- 197 0772 - Age structure of children in south serbia region included in motoric development follow-up - J. Ljubic, I. Petronic, D. Nikolic, Z. Jelic, L. Ilic-Jovic, L. Spasic
- 197 0773 - The Comparison of the effects of local corticosteroid injections applied with physical therapy and only physical therapy modalities on hemiplegic shoulder pain - T. Baykal, D. Kaya, K. Şenel
- 198 0774 - Accuracy of diagnosis of vegetative state in long-term survivors of acquired brain injury - G. F. Lamberti, V. Carle, N. Aimonino Ricauda, E. Antoniono, R. Carlucci, A. Mastromattei, N. Nicoletti, M. F. Stasi, V. Tibaldi
- 198 0776 - Muscle activation pattern in patients with spinal cord injury AIS A and AIS B during robotic assisted walking - T. Ribeira, A. Lopes, S. Santos
- 198 0778 - A case of stroke in a patient with essential thrombocytopenia and undifferentiated spondyloarthritis: an example of clinical complexity in physical medicine and rehabilitation - G. A. Checchia, A. Amato, A. Barbano, N. Camuzzini, G. Corvaglia, C. Lentino
- 198 0779 - Deambulation following total hip arthroplasty: role of the rehabilitative taking in charge in the early hours - G.A. Checchia, A. Barbano, R. Carioti, A. Maggioni, N. Camuzzini, A. Amato
- 199 0780 - Functional electrical stimulation improves upper limb recovery from hemiparetic stroke in subacute rehabilitation - Giovanni Antonio Checchia, Stefania Fugazzaro, Giovanni Morone, Davide Lenzi, Ernesto Urbano, Nicola Betti, Giuliana Gualandi
- 199 0781 - The outcomes of rehabilitation in traumatic hand flexor tendon injuries - E. Tülay, Ş. Füsün, E. Cem, Y. Serap, Ş. Hülya, K. Banu
- 199 0782 - Correlation between muscular vertebral pain in adult patients and acute dorsal kyphosis: Clinical aspects and therapeutic options - S. La Maestra, C. La Maestra, G. Vermiglio, A. Terranova, M. Vermiglio
- 199 0783 - Effects of Nd YAG laser therapy and eccentric exercises in the treatment conducted on housewives with chronic lateral epicondylitis - G. Vermiglio, A. Terranova, S. La Maestra, M. Vermiglio
- 200 0784 - The ESWL in the treatment of acute and chronic patellar tendinopathy in people that play sport regularly - A. Terranova, B. Pitrone, G. Vermiglio, M. Vermiglio
- 200 0785 - Low Urinary Tract Dysfunction (LUTD) after stroke: incidence and evolution in patients recovered in intensive neurorehabilitation unit - G. Panariello, F. Sirico, R. Gimigliano, C. Setola, C. Passarielli, C.N. D'Onofrio, V. Scarano, M.D. Grasso, G. Del Popolo
- 200 0786 - The long and winding road of patients affected by acquired brain lesion to reach home - B. Lanzillo, C. Calabrese, V. Provitera, R. Nucciotti, C. V. Russo, M. Guariglia, A. Estraneo, V. Loreto,
- 200 0787 - Effects of a 10-week aerobic training in high level disability multiple sclerosis patients - S. Diaconescu, D. Cinteza, S. Popescu, G. Galbeaza, V. Marcu, A. Dima, D. Poenaru
- 200 0788 - Cardiovascular disease at patients with SCI - G. Galbeaza, D. Cinteza, D. Poenaru, C. Teleianu, V. Marcu, S. Popescu, S. Diaconescu, A. Dima
- 201 0791 - Rehabilitation of paediatric patient with spinal cord injury. Case report - F. Armakola, S. Sivetidou, K. Mihout, I. Gekas, J. Saramantos, T. Pyrgeli, E. Bakas

- 201 0793 - A protocol for the assessment of sensory re-weighting in the development of coordination during reach-to-grasp in children - M. Cazzagon, F. Zecchini, G.P. Tornatore, D. Restuccia, A. Merlo
- 201 0794 - Comparison of functional outcome in Traumatic vs non-traumatic spinal cord lesions - L. Salvi, R. Avesani
- 202 0795 - Psychological resources of patients with motor impairment to realize their rehabilitation potential during early rehabilitation - A. Angelova, E. Ilieva M. C. García-Ameijeiras, A. Gómez- Garrido, M. Tovar-Felice, A. M. Leon-Espitia, S. Caño
- 202 0796 - Short term effects of ultrasound therapy in knee osteoarthritis - R. Ungur, I. Onac I, T. Mocan, L. Irsay, I. M. Borda, S. Suciú
- 202 0797 - Effect of PTH 1-84 on the increase in BMD and pain reduction in a retrospective study of patients with osteoporotic vertebral fractures - García-Ameijeiras M.C., Gómez-Garrido A., Tovar-Felice M., Leon-Espitia A.M., Caño S.
- 202 0798 - Combination of low level laser therapy and needle acupuncture in treatment of subacute low back pain in geriatric patients - L. M. Konstantinovic, S.J. Jović, A.S. Dragin
- 203 0799 - A case of paralysis caused by a disorder of the spinal cord in acute meningococcal meningitis - D. Uliano, R. Mazzocco, T. Scellini
- 203 0800 - A contribution for the data about Surf injuries in Portugal - J. Almeida, J. Laíns
- 203 0801 - Evaluating inpatient rehabilitation for subjects with traumatic brain injury: use of early variables to predict functional outcomes and direct clinical practice - R. Avesani, M. Fedeli, C. Ferraro, M. Khansefid
- 203 0802 - Painful accessory soleus muscle in the athletes: 3 first cases treated by Botulinum Toxin - A.S.M. Pop, M.A. Farago
- 204 0803 - Neuro-rehabilitation in Algarve. The CMR Sul experience Evidence – Efficacy – Effectiveness of a Comprehensive Rehabilitation Program - M. Sizenando, C. Castelo-Grande, L. Malaia, R. Diaz, J. Pimenta
- 204 0804 - Implementing Business Intelligence in Rehabilitation assessment and performance improvement - A case study - M. Sizenando, J. Pimenta
- 204 0805 - Do shared genetic factors account for the association between neck pain and other self-reported physical and psychological symptoms? A twin study among 11-year-olds - M. Ståhla, M. Mikkelsenb, A. El-Metwallyc, J. J. Salminen, L. Pulkkinen, R. J. Rosee, J. Kapriof
- 204 0806 - Correlative relation between arterial hypertension and parameters of recovery of the hemiplegics - S. D. Draganac
- 205 0807 - Rehabilitation Program in female child with Klippel-Trenaunay syndrome: a case study - G. Della Bella, O. Lai, S. Fabriani, C. Foti, E. Castelli
- 205 0808 - Recovery of upper limb in patients with recent ischemic stroke after application of repetitive magnetic transcranial stimulation - A. M. Bumbea, R. Traistaru, R. Popescu, D. Matei, A. Dinu
- 205 0809 - Peripheral repetitive magnetic stimulation (PRMS) in patients with traumatic paraplegia - A. M. Bumbea, R. Traistaru, A. Bighea, D. Matei, A. Dinu
- 205 0810 - Efficiency of topically applied therapy in reducing disease symptoms and signs in patients with CVI - J. Nikolić-Pucar, S. Markez, D. Gajić, V. Keković, D. Živanić
- 206 0811 - Bone quality in treatment of experimental osteoporosis with magneto-therapy - T. Lukač, G. Stefanovski, R. Škrbić, S. Marković
- 206 0812 - Efficacy of vertebral traction in sub acute sciatica of discal origin : a clinical controlled double-blind study - M.E. Isner-Horobeti, A. Dupeyron, J. Lecocq
- 206 0813 - tDCS combined with peripheral agonist/antagonist repetitive stimulation improves stroke outcomes - F. Palermo
- 206 0814 - Application of trigger point dry needling in Arnold Chiari I patients, Basic trigger points and effectiveness in 16 patients - Y. Ivánovic-Barbeito, A. Baños, S. Martínez
- 207 0815 - The effect of weighted kypho-orthosis on fall risk in women with osteoporosis - A. Racissadat, S. Pornajaf, R. Vahab Kashani
- 207 0816 - The Health Education Impact Questionnaire (heiQ) for evaluation of patient education - intermediate results of the adaption and validation of the German Version - M. Schwarze, R. Kirchhof, G. Musekamp, M. Schuler, I. Ehlebracht-König, S. Nolte, R. Osborne, H. Faller, C. Gutenbrunner
- 207 0817 - Use of chemical Neurolysis with phenol in reducing serious spasticity and work load for individuals in vegetative state. A randomized clinical trial - A. Giattini, A. Bonamartini, K. Cerquetti, E. Calderisi, L. Dionisi, M. Vallasciani
- 207 0818 - Comparative study of pressure distribution with different anti-sore cushion between chronic paraplegia and body mass index - L. Ortiz Fernández, N. Cívicos Sanchez, M^a L. Jauregui Abrisqueta, M. Cuadrado Rebollares, J. Uriarte Urizar, M^a P. Abaitua Ezquerria, A. Madariaga Zabala
- 208 0819 - Physical therapy after anterior arthroscopic bankart repair - D. Mitrovic, I. Diklic, D. Bogdanovic, I. Miljkovic
- 208 0820 - Physical therapy after liposuction surgery - Desanka Mitrovic, Velisa Arsic, Snezana Filipovic
- 208 0821 - Program of patient's rehabilitation after covering of soft tissue defects of achilleus region with distal based fascial and fasciocutaneous - I. R. Djokic, Z. Curcic
- 208 0822 - Physical therapy after liposuction surgery - D. Mitrovic, V. Arsic, S. Filipovic
- 209 0823 - Using the International Classification of Functioning, Disability and Health (ICF) Core Sets for Spinal Cord Injury (SCI) in epidemiological studies:..... - C. Boldt, I. Eriks-Hoogland, E. Von Elm
- 209 0824 - Using the ICF Core Sets for Spinal Cord Injury (SCI) as a reference: a comparison with established SCI data sets - I. Eriks-Hoogland, A. Cieza, R. Hilfiker, M. Post, H. Van Hedel, R. Cripps, Y. Chen, C. Boldt, G. Stucki
- 209 0825 - Influence of passive shoulder Range of Motion limitations on Activities and Participation in persons with Spinal Cord Injury - I. E. Eriks-Hoogland, S. De Groot, M. W. M. Post, L. H. V. Van der Woude
- 210 0826 - A "New" system of muscular strain and the role of stretch reflex in strength measure - M. Migliorini, A. Ravaschio, P. Lippi
- 210 0827 - Facial nerve palsy in children – the importance of etiology - M. João Azevedo, F. Ramada, L. Sá, A. Castro
- 210 0828 - Wrist pain due to scaphoid fracture - M.A. Farago, M.S. Pop, F. Cioara
- 210 0829 - Osteoporosis overdiagnosed in elderly with back-pain - S.M. Pop, M. A. Farago
- 211 0830 - The Effects of Plyometric Exercises on Functional Tests in Athletic and Non-Athletic Women - N. Taheri, A. Purmomeni

- 211** 0831 - Rehabilitation of acute vascular, nerve, and tendon injuries. Case report - S. González Burgos, L. Platas Gabriel, L. García Delgado, A. Mas Mas
- 211** 0832 - The effect of Monochromatic Infrared Energy in pain and wound healing - Maria João Azevedo, Filipe Ramada, Luís Sá, Ana Castro, Inez Ruvina
- 211** 0833 - Influence of second phase of rehabilitation on quality of life and functional capacity after coronary artery bypass graft surgery - U. Nedeljkovic, N. Krstic, S. Varagic Markovic, E. Dubljanin Raspopovic, N. Ilic, V. Vesovic Potic
- 211** 0834 - Constant shoulder score (CSS): there is no difference in strength, pain and total score between measures in abduction and elevation - C. Burrus, O. Deriaz, A. Almeida, G. Fanti, C. Favre, F. Gerber, B. Wynants, M. Konzelmann
- 212** 0835 - Motor aphasia after acute surgery for ruptured proximal middle cerebral artery aneurysm: case report - M. J. Leite, A. Camelo Pinto
- 212** 0836 - Old and complete brachial plexus paralysis: what can we do? - M. J. Leite, P. Cantista
- 212** 0837 - Clinical Dysphagia Examination with Cervical Auscultation in a Rehabilitation Medicine Unit - S. Faletti, G. Santus, F. Pirali
- 212** 0838 - Post-stroke depression a further study on motor and functional recovery - B. Lombardi, G. Briganti, M. Paci, L. Nannetti, P. D'Ippolito, V. Santoro
- 213** 0839 - Chronic low back pain in the elderly: gender differences - A. Vukomanovic, J. Arsic, V. Pejovic, G. Lukovic, S. Anicic, P. Pisev
- 213** 0840 - The 6-min walking test after cardiac bypass surgery and early rehabilitation - V. Pejovic, Z. Brdareski, A. Vukomanovic, A. Djurovic, P. Pisev, S. Anicic
- 213** 0841 - The early rehabilitation of patients after transplantation of liver - P. Pisev, V. Pejović, A. Vukomanović, A. Durović, Z. Brdareski
- 213** 0842 - Nutritional status (NS) in neurologic disorders - I. Avdyunina, V. Alferova, L. Chernikova, V. Ionova, A. Shabalina, M. Kostureva
- 214** 0843 - A Survey of patients with lower limb amputation referred to IRCS comprehensive rehabilitation centre (March 2008 to December 2009) - A. Raecissadat, S. Alavi, P. Mozhgani, A. Eshraghi
- 214** 0844 - Fatigue as experienced by rheumatoid arthritis patients. a cohort of 44 Tunisian cases - H. Migaw, A. Jellad, S. Boudoukhane, H. Laajili, Z. Ben Salah Frih
- 214** 0845 - Health-Related Quality of life in Rheumatoid Arthritis: a Tunisian cohort - Z. Ben Salah Frih, H. Migaw, A. Jellad, S. Boudoukhane, H. Laajili
- 215** 0846 - Fatigue-correlated factors in rheumatoid arthritis - H. Migaw, S. Boudoukhane, A. Jellad, H. Laajili, Z. Ben Salah Frih
- 215** 0847 - Diagnosis and cranial osteopathic treatment of torticollis and positional plagiocephaly in pediatric age - V. Savoia, S. Boscarino, P. La Viola, E. Pacciani, E. Castelli
- 215** 0848 - The effect of Monochromatic Infrared Energy in pain and wound healing - M. J. Azevedo, F. Ramada, L. Sá, A. Castro, I. Ruvina
- 215** 0849 - The relationship between TMS evoked motor potentials and clinical status in chronic stroke - E. Cakar, I. Yagci, E. Karadag-Saygi, H. Kilac, O. Hakan Gunduz, M. Zeki Kiralp, G. Akyuz
- 216** 0852 - Patient's experience of parenteral Ketamine injections in chronic non-malignant pain - B. H. Sjölund, M. Andersson
- 216** 0853 - Neurological rehabilitation technique for spasticity in patient with multiple sclerosis. A case report - L. Lombardi, A. Ravaschio, M. Migliorini, V. Belloni, F. Galluzzi
- 216** 0854 - Combining transcranial direct current stimulation and functional task training for upper extremity motor recovery in a 19 year-old stroke survivor. A case report - S. Straudi, E. Chew, I. Cajigas, F. Fregni, P. Bonato
- 216** 0855 - The effects of robot-assisted gait training on spatiotemporal gait parameters and locomotors function in subjects with multiple sclerosis - S. Ursino, E. Venturini, L. Balugani, C. Pampolini, S. Cavazza, S. Straudi, N. Basaglia
- 217** 0856 - Clinical and statistical considerations on the rehabilitation assessment in FAO by means of stroke evaluation minimal protocol (SEMP) - M. D'Andrea, L. Leo, D. De Buono, T. Catanzaro, L. Fratto, E. Fata, S. Catanzaro, G. A. M. Amendola, R. Ciambrone, M. Iocco
- 217** 0857 - Valutazione dell'efficacia terapeutica del sistema elkmed ebs 2060 nel trattamento delle lombosciatalgie - M. Groppi
- 217** 0858 - A Survey of Complex Regional Pain Syndrome in Jordanian Patients - Z.M. Hawamdeh, A.S.A. Oweidi, M.M. Al-Mustafa
- 217** 0859 - Fall prevention in the elderly: an integrated assessment and rehabilitation program - S. Bargellesi, F. Ostan, E. Spazzoli, G. Stival, P. Pessotto
- 218** 0860 - The attivation of a specific clinical pathway for severe acquired brain injury: a one year analysis in our rehabilitation medicine department - S. Bargellesi, A. Bazzana, M. Semerjian, A. Tessari, G. D'Arienza, A. Calabrese, C. Zanardo, E. Rodaro, P. Boldrini
- 218** 0861 - Osteoid Osteoma of the Olecranon – a Rare Location - M.M. Ribeiro, S. Marques, S. Magalhães, R. Vaz, P. Barros
- 218** 0862 - Functional recovery and frequency of medical complications during post-acute rehabilitation of stroke patients - A. Dragin, A. Stefanovic, S. Draca, B. Ljesevic, D. Paspalj, L. Schwirtlich
- 218** 0863 - Cockayne Syndrome rehabilitation, Issues and resolution on 2 cases - Y. Ivánovic-Barbeito, S. Fernández, S. Molia
- 219** 0864 - Back pain in people affected by spasticity muscular spasm post spinal cord injury - M. G. Onesta, S. Valvo, G. Patanè
- 219** 0865 - Functional outcome after hemiarthroplasty in elderly patients - Kocic M., Lazovic M., Dimitrijević L., Ciric T., Stankovic A., Spalevic M.
- 219** 0866 - Rehabilitation Treatment for Spatial Neglect: Manipulating Brain Plasticity in Neural Networks for Spatial Attention and Space Representation - Nachum Soroker
- 219** 0867 - Acupuncture and stroke: confrontation between somatic acupuncture and cranioacupuncture in the treatment of motor deficiencies - L. Guarinoni, F. Noro, S. Galeri, A. Testa
- 220** 0869 - Action observation in stroke patients: investigating the mechanism using EEG - S. Frenkel-Toledo, S. Bentin, D. Liebermann, N. Soroker
- 220** 0870 - Stroke: Botulinum toxin in Hemiplegic Shoulder Pain - E. A Sevilla-Hernandez, J. V Lozano-Guadalajara, M. Gonzalez- Moro
- 220** 0871 - Stroke: Botulinum toxin in Wrist spasticity - E. A. Sevilla-Hernandez, J. V. Lozano-Guadalajara, I. Martinez-Gonzalez-Moro

- 221 0872 - Stroke: Botulinum toxin in Spastic Hand - E. A. Sevilla-Hernandez, J. V. Lozano-Guadalajara, I. Martinez-Gonzalez-Moro
- 221 0873 - Botulinum toxin in stroke: Rehabilitation unit experience - E. A. Sevilla-Hernandez, J. V. Lozano-Guadalajara, I. Martinez-Gonzalez-Moro
- 221 0874 - Neurologic impairment at the onset of Behcet's disease - E. A. Sevilla, L. Garrote, M. L. Lopez, C. Corrochano, L. Cano, R. Villaverde
- 222 0875 - Efficacy of diclofenac sonophoresis in musculoskeletal pain reduction - V. Keković, S. Markez, D. Gajić, J. Nikolić, D. Zivanić
- 222 0876 - Pain intensity after surgically treated hip fractures - D. Gajić, G. Ljubojević, V. Keković, J. Nikolić, B. Majstorović
- 222 0877 - Measurement of Disability in persons with Marfan Syndrome - C. Gallo, V. Bozzo, B. Contini, C. Foti
- 222 0878 - Robot-assisted hand training (Amadeo) compared with conventional physiotherapy techniques in chronic ischemic stroke patients: a pilot study - R. Helbok, G. Schoenherr, M. Spiegel, M. Sojer, C. Brenneis (Austria)
- 223 0879 - Tethered cord syndrome in Arnold Chiari Malformation: a challenge in rehabilitation - I. Springhetti, A. Zancan, S. Rossi
- 223 0880 - Conservative treatment associated with PNF of motor deficit extension of the wrist and fingers in of the radial nerve injury: case report - G. Giovannico, F. Maselli, M. Cannone, A. Rahino, M.L. De Nuzzo, G. Urso, M. Lanzetta
- 223 0881 - Impact of Virtual Rehabilitation on Neuromuscular Control by means of the Wii Fit - D.N. Bassett, E. De Canonico, A. Archilietti, A. M. Orsolino, G.G. Cerulli
- 223 0882 - Pain management and exercise therapy for successful treatment of severe persistent low back pain - M. Guglielmetto, G. Calcarella, G. Trevisan, D. Primon
- 224 0883 - The impact of spinal cord lesions on quality of life - M. Micha, A. Mathiopoulos, K. Petropoulou
- 224 0884 - Can "Adapted physical activity" improve mobility, function, and quality of life in stroke patients after rehabilitation? The EFG-et project assessing the feasibility..... - M. Taricco, E. Bassi, C. Bernucci, S. Borghi, G. Camurri, E. Carretta, E. Cavalli, L. Dallolio, A. Di Gioia, A. Foresti, S. Fugazzaro, N. Gaudenzi, B. Kopliku, V. Manigrasso *et al.*
- 224 0885 - Minimal data set for stroke patients (protocollo di minima per ictus cerebrale - PMCI): local implementation for the complex care of stroke patients - M. Taricco, E. Zardi, M. Bettoni, C. Bernucci, E. Cavalli, A. Gazzotti, A. Di Gioia, P. Graziani, V. Marchionni, B. Miccoli, L. Favero
- 225 0886 - Characteristics and usefulness of the "modified" barthel index (BIM) in the rehabilitation setting: a shared team experience - M. Taricco, G. Alberti, E. Andreoli, N. Cantafora, A. Foresti, A. Gazzotti, M. Menarini, B. Miccoli, E. Monti, E. Zardi, E. Arcangeli, F. Bianconcini, S. De Franceschi *et al.*
- 225 0887 - How do individuals with spinal cord injury choose activities? A Qualitative study based on a phenomenological hermeneutic method - D. Van de Velde, P. Bracke, G. Van Hove, S. Josephsson, G. Vanderstraeten
- 225 0888 - Pelvic region electrical neuromuscular stimulation reduces urinary incontinence in the elderly - F. Palermo
- 225 0889 - Paralytic Lagophthalmus in seventh nerve palsy: new treatment options for lid and lachrymal rehabilitation - A.L. Giacomini, D. Primon
- 226 0890 - Critical points on neglect treatment with prismatic goggles - M. Mancuso, M. Pacini, P. Gemignani, B. Bartalini, L. Ferroni, M. Caputo, D. Capitani, E. Mondin, A. Cantagallo
- 226 0892 - Sensory-motor integration during standing spatial rotational task in children with cerebral palsy - M. Petrarca, G. Zanelli, F. Patanè, P. Cappa, E. Castelli, A. Berthoz
- 226 0893 - Kinematic and Kinetic characteristics of planar reaching during robotized training in children with brain injury - M. Petrarca, S. Rossi, F. Patanè, E. Castelli, P. Cappa
- 226 0894 - Personality changes after ISPC (Iowa Scales of Personality Change) - A. Cantagallo, E. Contini, A. Bianchi
- 227 0895 - Rasch analysis as a validation tool for conceptual models: development and analysis of internal constructive validity of a new scale based on the levels of cognitive functioning (LCF) - A. Cantagallo, F. La Porta
- 227 0896 - Use of Botulinum toxin type A in patients with hereditary spastic paraplegia (HSP), review of 5 cases - Y. Ivánovic-Barbeito, S. Martínez
- 227 0897 - Therapeutic options in focal dystonia in musicians (pianists). Treatment over 1 year and 10 patients - Y. Ivánovic-Barbeito, C. Cop
- 228 0898 - Rehabilitation and orthosis in a case of upper limb replant - T. Iacomussi, F. Bergamin, P. Toro, G. D'Urso
- 228 0899 - Case study of patients attended in a rehabilitation polyclinic - K. V. Méndez-Saavedra, I. Barca-Fernández, C. Cuenca-González, I. Flores-Torres, M. Archanco-Olcese, H. De la Peña
- 228 0900 - Management of generalized spasticity in multiple sclerosis with intrathecal baclofen pump (IBP) - M. Micha, C. A. Rapiđi, G. Siamos, P. Manthos, S. Kaligerou, E. Bikaki, N. Lykoudi, K. Petropoulou
- 228 0901 - Multiple Sclerosis and osteoporosis in female patients - M. Micha, P. Kokkonis, A. Papachristos, A. Tsivgoulis, E. Bikaki, N. Likoudi, K. Petropoulou
- 228 0902 - A technology-assisted learning setup as assessment supplement for persons with a diagnosis of post-coma vegetative state and pervasive motor impairment J. Navarro Solano, G.E. Lancioni, F. Buonocunto, V. Sacco, F. Colonna, C. Lanzilotti, G. Megna
- 229 0903 - Technology-based intervention options for post-coma persons with minimally conscious state and pervasive motor disabilities - J. Navarro Solano, G. E. Lancioni, F. Buonocunto, V. Sacco, F. Colonna, C. Lanzilotti, G. Megna
- 229 0904 - Effects of sacral neuromodulation on the erectile and ejaculatory function in SCI patients - V. Tagliente, J. Navarro Solano, F. Colonna, G. Megna
- 229 0905 - Effects of upper extremity motor recovery on gait pattern late after stroke - G. Yavuzer
- 230 0906 - Correlations between intelligence levels and event-related potentials in hyperactive and normal children - L. Foggia, M. Colucci, O. D'Addio, M. Rosaria Bisogno, R. Gigante
- 230 0907 - Efficacy of cyclic stretching in the prevention of equinus in acute and sub-acute patients with upper motor neuron syndrome (UMNS). A randomized controlled trial - I. Campanini, A. Merlo, L. Cavazzuti, F. Lombardi, R. Brianti
- 230 0908 - Pain management in rehabilitation - P. Marchetti, L. Franchini, S. Mastrangelo, A. Briganti, D. Miletti, S. Abriani, A. Nadalini, F. Ferrari, L. Spagnolatti, P. Bonacini, M. B. Ligabue, N. Rossi, D. Zoboli, R. Brianti

- 230 0909 - Muscle damage and subsequent histological changes after intensive rehabilitation approach: Case report - F. Maselli, A. Rahinò, M. Cannone, M. Megna
- 231 0910 - Mental Imagery (MI) and Mental Practice (MP) for the recovery of facial expression in peripheral paralysis of VII C.N.: case report - A. Rahinò, P. Putignano, F. Maselli, M. Cannone, E. Tripaldi, M. Megna, G. Megna
- 231 0911 - Project SAM: Satisfaction, Awareness and Motivation among undergraduate students of rehabilitative class (SNT/2) at the University of Bari - M. Cannone, V. Lavermicocca, F. Maselli, M. R. Scaramuzzi, A. Rahinò, M. Megna, A. R. Dellomonaco, G. Megna
- 231 0912 - Upper limb recovery in a patient with Unilateral Spatial Neglect treated with mirror therapy: case report - A. Rahinò, A. R. Dellomonaco, V. Lavermicocca, F. Maselli, M. Cannone, M. Scaramuzzi, P. Putignano, E. Tripaldi, M. Megna
- 231 0913 - Cognitive rehabilitation in dementia: case report - A. Parente, A. R. Dellomonaco, V. Lavermicocca, P. Battista, S. Lamacchia, E. Tripaldi, M. Megna
- 232 0914 - Stimulation of oral function in vegetative state: case report - A. Parente, C. Zanella, A. R. Dellomonaco, V. Lavermicocca, M. Scaramuzzi, S. Baldassarre, M. Megna, G. Megna
- 232 0915 - Customer Satisfaction in the Health System: the case of a Polyvalent Rehabilitation Centre - P. Perrone, A. R. Dellomonaco, T. Cetani, E. De Francesco, V. Lavermicocca, M. Cannone, M. Scaramuzzi, F. Maselli, A. Rahinò, M. Megna
- 232 0916 - The respect of identity of the patient for an ethical approach in operative unit of Physical Medicine and Rehabilitation - A. R. Dellomonaco, E. De Francesco, P. Perrone, V. Lavermicocca, A. Rahinò, F. Maselli, M. Cannone, M. Scaramuzzi, M. Megna, G. Megna
- 232 0917 - Case report: pragmatic approach and social reintegration in a case of global aphasia - V. Lavermicocca, A. R. Dellomonaco, A. Parente, M. Scaramuzzi, D. Mascolo, E. Tripaldi, M. Megna
- 233 0918 - Role of manual therapy for the mobility recovering of ankle and foot joints after fracture of calcaneus: case report - F. Maselli, M. Cannone, A. Rahinò, M. Megna
- 233 0919 - Case report: Rehabilitative multidimensional-individualized approach to the person with Huntington's disease and caregivers - E. Tripaldi, A. R. Dellomonaco, M. R. Scaramuzzi, F. Maselli, V. Lavermicocca, A. Rahinò, A. Parente, M. Cannone, C. Cataldi, M. De Tommaso, M. Megna
- 233 0920 - Cancer-Related Fatigue in children. Preliminary data - A. Morales Mateu, N. Rodríguez Nieva, V. Calderon Padilla, J. Medina Cantillo, A. Nuñez Farias, A. Febrer Rotger.
- 234 0921 - Functional outcome after hemiarthroplasty in elderly patients - M. Kocic, M. Lazovic, L. Dimitrijevic, T. Ciric, A. Stankovic, M. Spalevic
- 234 0922 - Respiratory physiotherapy for morbid obese patients. Effects on autonomic function M. de Sant'Anna Junior, - J. Regis Ivar Carneiro, F. Silva Guimarães, D. Rodrigues Xerez, A. Mafra Moreno, D. de Faria Magalhães Torres, R. Carvalhal, J. E. P. de Oliveira
- 234 0923 - Impact of a Respiratory Physiotherapy Rehabilitation Program on the respiratory system of morbidly obese patients M. de Sant'Anna Junior, - J. Regis Ivar Carneiro, F. Silva Guimarães, D. Rodrigues Xerez, A. Mafra Moreno, D. de Faria Magalhães Torres, R. Carvalhal, J. E. P. de Oliveira
- 234 0924 - Is it possible to improve the quality of life using low level laser therapy (LLLT) in rheumatoid arthritis patients? A double-blind investigation - I. Stojanovic Olivera, L. Milica
- 235 0925 - Effect of Lidocaine Iontophoresis on Pain during Needle EMG - A. Morchower, T. Annaswamy
- 235 0926 - Electrodiagnosis of Nerve Injury from Chronic Swelling in the Forearm: A case report - A. Morchower, Z. Tong, K. Scott
- 235 0927 - Establishment of a rehabilitation center in a state prison hospital: the santa casa De São Paulo experience - M. Saul, C. Gomes, H. Nunes, N. Carvalho, T. Bertolini, R. Bueno, L. Fernandes, R. Guedes, Â. Gusmão, L. Martins, N. Meinrath, P. Miguez, W. Pedersoll, *et al.*
- 235 0928 - Activity implications for boys with DMD based on a MDX exercise study - T. Duong, M. Iantorno, A. Sali, H. Gordish, D. Guerron, K. Grassmeyer, K. Janes, M. Lerma, K. Nagaraju
- 236 0929 - Combined application of external counterpulsation and extracorporeal cardiac shockwave therapy for rehabilitation of heart failure patients - V. Petukhova, T. Shapovalenko, K. Lyadov
- 236 0930 - Usage of biological feedback at neurostimulation among patients with neurogenic bladder dysfunction - B.E. Rudakov, E.P. Rozhnevskaya, T.V. Shapovalenko, K.V. Lyadov
- 236 0931 - Application of bio molecular conductor in the complex treatment of benign prostatic hyperplasia in the combination of chronic prostatitis - B.E. Rudakov, E.P. Rozhnevskaya, T.V. Shapovalenko, K. V. Lyadov
- 236 0932 - Complex application of shock-wave therapy, bio-molecular conductor and vacuum decompression of penis in treatment of Peyronie's disease - B.E. Rudakov, E.P. Rozhnevskaya, T.V. Shapovalenko, K.V. Lyadov
- 237 0933 - The transcranial magnetic stimulation for the patients with spinal cord injury - T. Shapovalenko, K. Lyadov, T. Baydova, I. Sidiyakina, V. Ivanov
- 237 0934 - Using of transcranial magnetic stimulation during the treatment of patients in persistent vegetative state - K. Lyadov, T. Shapovalenko, T. Baydova, I. Sidiyakina, T. Isaeva
- 237 0935 - Complex treatment of lumbodynia using extracorporeal shock wave therapy - S.A. Khakimov, K.V. Lyadov, T.V. Shapovalenko
- 237 0936 - Restoration of equilibrium function among patients with Ménière's syndrome - I.Y. Ginichkina, I.V. Sidiyakina, T.V. Shapovalenko, K. V. Lyadov
- 237 0937 - Peculiarity of central and peripheral circulation in spinal cord injured patients during Lokomat-training - M. Makarova, V. Petukhova, E. Koneva, T.V. Shapovalenko, K. V. Lyadov
- 238 0938 - Application of homotoxicological pharmacopuncture in the programs of treatment of patients with vertebro-genic pain syndromes - A. A. Chigarev, K. V. Lyadov, T. V. Shapovalenko
- 238 0939 - Some peculiarities of shock wave reflex-therapy of vertebro-genic-diskogenic diseases - V. V. Korotkiy, S. A. Khakimov, K. V. Lyadov, A. P. Manevskiy
- 238 0940 - The influence of complex programs of restoration treatment on the increase in life quality of trauma brain injured patients - E.S. Koneva, M.R. Makarova, S.E. Khatkova, T.V. Shapovalenko, K. V. Lyadov
- 238 0941 - Gender and rehabilitation outcome in stroke patients - L. Iona, A. Varnier, E. Deotto, C. Dominutti, E. Bocin, S. Polentarutti, F. Lipanje, T. Giorgini, P. Di Benedetto

- 239 0942 - Experience of the introduction of cardiac shockwave therapy (CSWT) in the treatment and rehabilitation of patients with coronary artery disease - V. Petukhova
- 239 0943 - Neck traction in the complex treatment of epicondylitis I.I. Solonets, - K.V. Lyadov, T.V/Shapovalenko
- 239 0944 - The influence of interval hypoxemic trainings on the efficiency of rehab of athletes after injuries - K. Liadov, V. Preobrazhenskiy, O. Zinoviev, E. Sidorenko, T. Shapovalenko
- 239 0945 - The influence of enhanced external counterpulsation in combination with physical therapy on the efficiency of rehab of athletes after injuries - K. Liadov, V. Preobrazhenskiy, O. Zinoviev, E. Sidorenko, T. Shapovalenko
- 240 0946 - Enhanced external counterpulsation in heart failure decompensation S. Tripkosh, - K. Lyadov, T. Shapovalenko, S. Malanichev, A. Lutsenko,
- 240 0947 - Combined application of enhanced external counterpulsation and cardiac shock wave therapy in coronary arteries disease - S. Tripkosh, K. Lyadov, T. Shapovalenko, S. Malanichev, A. Lutsenko
- 240 0948 - Optimization of standard method of mobilising-vacuum therapy LPG considering the concept of eastern medicine - V.I. Tsoy, T. V. Shapovalenko
- 240 0949 - Cardio-vascular functions and physical endurance - M. Lazovic
- 240 0950 - Use of Vibration Energy for Bone Regeneration: a case study - C. Trombetta, P. Abundo, A. Civitella, E. Mariani, N. Rosato, C. Foti
- 241 0951 - Any dose-response relationship in rehabilitative treatment of acute stroke? A study on 326 patients - E. Rizzi, G. Dora, C. Brun, D. Zanotti, G. Isabelli, M. Capovilla, C. Sottini
- 241 0952 - neurocognitive approach to severe brain injury: different point of views of intervention - G. Schierano, P. Valorio, M. Mantelli, S. Petrozzino
- 241 0953 - Tracheostomy decannulation in rehabilitation of ABI: l'essenziale - V. Cappuzzo, N. Giunta, G. Schierano, L. Perrero, M. Mantelli, M. Meloni, S. Petrozzino
- 242 0954 - Early risk factors of pressure sores in patient with brain injury - N. Giunta, V. Cappuzzo, G. Schierano, M. Mantelli, R. Baio, S. Petrozzino
- 242 0955 - Continuing care for individuals with spinal cord injury and complex acquired brain injury - M. Lauro, R. Lorusso, M. Mantelli, L. Iebrino, S. Petrozzino
- 242 0956 - Computerized tomography (CT)-guided botulinum toxin injection (BTXA) of the iliopsoas muscle (IP) by posterior approach: a case report - M. Marchioni, L. Perrero, M. Lauro, V. Cappuzzo, S. Petrozzino
- 242 0957 - Complex acquired brain injury : infections at the early time of rehabilitation - R. Baio, N. Giunta, M. Lauro, M. Mantelli, S. Petrozzino
- 243 0958 - Determination of quality of life in adolescents with idiopathic scoliosis subjected to conservative treatment - A. Specchia, A.G. Aulisa, C. Perisano, E. Marzetti, G. Ronconi, P.E. Ferrara, A. Rabini, C. Nigito, L. Maggi, D.B. Piazzini, C. Bertolini, L. Aulisa
- 243 0959 - Role of Spiritual Beliefs in inpatient rehabilitation unite: preliminary data - D.B. Piazzini, P.E. Ferrara, G.P. Ronconi, L. Maggi, A. Rabini, A. Specchia, C. Nigito, E. Amabile, C. Bertolini
- 243 0960 - JOBA for chronic Low Back Pain - A. Sgadari, A. Rabini, M. Broccatelli, S. De Bellonia, L. Maggi, P. Ferrara, C. Nigito, C. Bertolini, D.B. Piazzini
- 244 0961 - Short- and Medium-term Effectiveness of Hyperthermia for Knee Osteoarthritis - A. Rabini, A. Sgadari, S. Paravati, G. Tancredi, C. Nigito, C. Foti, L. Maggi, P. Ferrara, A. Specchia, G. Ronconi, D. B. Piazzini, C. Bertolini.
- 244 0962 - Comparison between corticosteroid sub-acromial injections and shoulder Hyperthermia. Valuation on pain and functional status of patients with rotator cuff tendinopathy..... - A. Rabini, A. Sgadari, S. Paravati, G. Tancredi, C. Nigito, C. Foti, L. Maggi, P. Ferrara, A. Specchia, G. Ronconi, G. Milano, M. F. Saccomanno, D. A. Santagada, C. Bertolini, D. B. Piazzini
- 244 0963 - Assessment of upper limb robot-aided rehabilitation in chronic hemiparetic patients: a biomechanical approach - S. Mazzoleni, R. Creccchi, M. C. Carrozza, F. Posteraro
- 244 0964 - Cough Assist Mechanical Insufflator-Exsufflator Machine in Neuromuscular Patients in a Rehabilitation Ward - M. Mantellini, L. Perrero, A. Bottazzi, V. De Michelis, L. Bruni, M. Meloni, S. Petrozzino
- 245 0965 - Analysis of rehabilitative cardio-respiratory needs in functional area 4 of Piemonte region - S. Petrozzino, V. De Michelis, E. Mantellini, L. Perrero, N. Vivaldi
- 245 0966 - A year of Customer satisfaction results in cardio respiratory rehabilitation - V. De Michelis, E. Mantellini, L. Perrero, S. Petrozzino
- 245 0967 - Report of one year activity in Cardio respiratory Rehabilitation at The Borsalino's Hospital in Alessandria- Italy - V. De Michelis, E. Mantellini, L. Perrero, S. Petrozzino
- 245 0968 - Secretion management in the invasive mechanically ventilated patient in a rehabilitation ward: the use of high frequency chest wall oscillation (HFCWO) - M. Mantellini, L. Perrero, A. Bottazzi, V. De Michelis, A. Gatta, S. Bona, S. Petrozzino
- 246 0969 - Patient fall reporting system in Hungary - E. Boros, É. Belicza, G. Fazekas, Z. Dénes
- 246 0970 - Application of the constraint-induced movement therapy modified in children with disabilities – EMG analysis of muscle recruitment - M. Sicari, D. Caramma, I. Commodari, C. Sergi, M. Manoli, A. Faranda, M. Origlio, C. Dipietro, M. Sci, T. D' Erario, S. Verzi
- 246 0971 - Clinical work developed in a rehabilitation centre during the year 2009 - A. Pereira, J. Lains, P. Margalho, C. Noronha, P. Amorim, J. Almeida, I. Lucas, G. Beça, P. Figueiredo, S. Santos, J. Branco
- 247 0973 - Botulinum toxin A injection to pectorals minor muscle in a patient with venous thoracic outlet syndrome - G. Erden, D. Palamar, K. Akgün, F. Kantarcı, L. Özçakar
- 247 0975 - Euroaspire III Romania follow-up: role of general practitioner in smoking cessation - D. Stancila, L. Craciun, S. Iurciuc, M. Iurciuc, C. Avram, A. Avram, C. Ciulacu, D. Gaita
- 247 0976 - A psychiatric screening assessment in an institutionalized adult population with mental retardation and neurological impairment -
- 247 0977 - Test for functional outcome of soccer players after ACL reconstruction at the end of assisted rehabilitation - F. Danelon, D. Pisoni
- 248 0978 - Case report: diagnosis and proposal of rehabilitative treatment in a patient with hysterical dysphonia - S.

- Damiani, M. Ranieri, A. P. Amico, R. Cortese, M. Megna, G. Megna
- 248** 0979 - Will an electronic form help the information exchange among professionals? Experimental study on the communication between nurses and physiotherapists in the case.... - M. Fornasiero, L. Coppola, D. Limone, M. Zamagni, M. Cattozzo, M. Niolu
- 248** 0980 - Group treatment for patient with chronic low back pain: 10 or 20 session exercise programme? - L. Coppola, L. Guidolin, S. Masiero, A. Giovannini
- 248** 0981 - Un esempio di collaborazione per il turismo inclusivo: la valutazione dell'accessibilità ai passeggeri nel Porto di Venezia - Massaro C., Tonin P., Sensini F., Gallo C., Gianotti N.
- 249** 0982 - New technologies of restorative medicine in ophthalmology - O. Yurova, A. Razumov, I. Bobrovnicshiy, G. Nazarova, T. Konchugova
- 249** 0983 - Evaluation of patients with gait abnormalities in PRM settings based on ICF, PRM Programme of Care - Delarque A., Bensoussan L., Collado H., Viton J.M.
- 249** 0984 - Retrospective study on outcome of post-anoxic brain injured patients - A. Montis, G. Zani, S. Lavezzi, A. Bertocchi, F. Scano, N. Basaglia
- 249** 0985 - Results of Physical Treatment in the Spa and Medicamentous Therapy on Muscle Strength and Trunk Mobility in Subjects with Lower Bone Density - S.K. Marković, R. Filipov, J. Jovanović, A. Kapetanović
- 250** 0986 - New methods of restorative treatment of patients with cerebrovascular diseases - Penionzhkevich Daria, Gorbunov Fedor
- 250** 0987 - Physiobalneotherapy methods in rehabilitation programs of patients with cardiovascular diseases - V. Badtieva
- 250** 0988 - Theory of intensity in care-rehabilitation - G. Graziani, A. Marchese, M.L. Nicodemo, M. Celestini
- 251** 0989 - Modern rehabilitation programs in physiobalneotherapy of Lymphedema of lower extremities - T. Iacomussi, F. Bergamin, P. Toro, G. D'Urso
- 251** 0990 - Curved walking in stroke patients - A. Nardone, M. Godi, M. Grasso, M. Schieppati
- 251** 0991 - Osteoporosis in pregnancy - Gulseren Akyuz
- 251** 0992 - Rasch analysis of the Stress-Energy Questionnaire - Å. Lundgren-Nilsson, A. Pousette, A. Ekman P. Larsman
- 252** 0993 - Psychometric properties of the Shirom-Melamed burnout questionnaire (SMBQ) - Å. Lundgren-Nilsson, I.H. Jonsdottir, G. Ahlborg Jr, J. Pallant, A. Tennant
- 252** 0994 - Past and present issues in Rasch analysis: The Functional Independence Measure (FIM™) revisited - A. Tennant, Å. Lundgren-Nilsson
- 252** 0995 - The European Project SMILING: Self Mobility Improvement in the Elderly by counteracting falls - F. Marcellini, M. Bulgheroni, S. Bar-Haim, C. Bula, D. Carus, L. Chiari, D. Šimšik, J. Penders, K. Aminian, P. Pavlov
- 252** 0996 - Accelerometry-based activity spectrum in persons with chronic physical conditions - J.B.J. Bussmann, H.J.G. van den Berg-Emons, H.J. Stam
- 253** 0997 - Decompressive craniectomy and evaluation of outcome from regional database GRACER - N. Basaglia, G. Zani, L. Roma, F. Servadei, S. Ferro
- 253** 0998 - Pressure ulcers in spinal-cord injured patients A Retrospective Study of the Effect of Lifestyle on the Development of Pressure Ulcers - N. De Baets, T. Defloor, E. De Ruyck, G. Vanderstraeten, A. Viaene
- 253** 0999 - Total hip arthroplasty in young patients. Rehabilitation - S. Pantelic, O. Nikolic, Z. Bascarevic
- 253** 1000 - The Italian ABILHAND questionnaire can measure manual ability across a variety of motor impairments - A. Simone, L. Tesio, V. Rota, L. Perucca
- 254** 1001 - The synergies of instrumental assessment, botulinum toxin (BT) and rehabilitation in the Multiple Sclerosis' spasticity - G. Ianieri, R. Marvulli, M. Ranieri, G. Tondi, S. Altini, L. Mastromauro, E. Romanelli, M. Megna, G Megna
- 254** 1002 - Effectiveness of combined treatment of botulinum toxin, biofeedback, electrical stimulation and physiotherapy in chronic pelvic floor - Ianieri G., Ranieri M., Marvulli R., Tondi G., Miccoli S., Mastromauro L., Romanelli E., Megna M. e Megna G.
- 254** 1003 - Objectives for logopedic management of serious acquired brain injury patients in early post-acute rehabilitation — proposal of a chart for multidisciplinary observation..... - M. Manfredini, A. Stori, R. Tralli, G. Arioli
- 255** 1004 - Does human gait exhibit comparable and reproducible long-range autocorrelations on level ground and on treadmill? - B. Bollens, F. Crevecoeur, V. Nguyen, C. Detrembleur, T. Lejeune
- 255** 1005 - Botulinum toxin versus Fascial Manipulation technique in the treatment of chronic facial pain associated with temporo-mandibular dysfunction - A. Stecco, L. Guarda-Nardini, D. Manfredini, S. Bressan, C. Ferraro, S. Masiero
- 255** 1006 - Effects of a rehabilitation treatment including kinesitherapy and hydrokinesitherapy in a spa centre: a randomized controlled trial in patients with postmenopausal osteoporosis - S. Masiero, L. Bonaldo, A. Stecco, S. Bressan, C. Ferraro, A. Lalli
- 256** 1007 - Post-stroke robotic training of the upper limb: a randomized trial study (preliminary results) - S. Masiero, G. Rosati, S. Valarini, P. Poli, G. Ferlini, A. Chiasera, M. Armani, A. Rossi, C. Ferraro
- 256** 1008 - Twelve-month follow-up of rehabilitation treatment for the management of patients with ankylosing spondylitis in anti-TNF treatment. A randomized controlled trial - S. Masiero, L. Bonaldo, M. Pigatto, R. Ramonda, A. Lo Nigro, L. Punzi, C. Ferraro
- 256** 1010 - Acetylcholinesterase inhibitor donepezil chlohydrate effectiveness in critical cognitive impairment and behavioural disorders after serious TBI: a case report - M. Calegari, S. Di Carlo, L. Cocchini, A. Eskenazi, C. Macchetta, M. Beatrici, A. L. Fogliato
- 257** 1011 - Buccality and cognitive impairment in patient affected by Traumatic Brain Injury - S. Vesco, A. L. Fogliato, M. Alloro, M. Cancelli, C. Macchetta, M. Beatrici, A. Cistaro
- 257** 1012 - The effects of inpatient rheumatologic rehabilitation programs on the function and disease activity in chronic rheumatoid arthritis and ankylosing spondylitis: one-year follow-up - F. Figen Ayhan, R. Yazıcı, M. Geçene, P. Borman, Z. Rezan Yorgancıoğlu
- 257** 1013 - Determinants for muscle recovery in upper and lower motor neuron traumatic lesions useful for selecting paraplegics subjects to stand and walk through FES - B. Almajan-Guta, V. Almajan-Guta, C. Avram
- 258** 1014 - Treatment of disorders of neurological disability in mobility in inclusive tourism - G. Arbosti, L. Pignataro, G. Filippini, D. Bonaiuti, P. Cornelio, N. Gianotti, F. Cornelio
- 258** 1015 - OPIN – A Permanent Observatory on Neurorehabilitation – A interregional experience -

- N. Gianotti, A. Compostella, C. Gallo, F. Cornelio, A Lalli, G. Arbosti
- 258** 1016 - Accessibility, clinical rating scales and costumer satisfaction of the person with neurological disability: operational tools - L. Pignataro, P. Cornelio, G. Bodini, L. Pressato, C. Gallo
- 258** 1017 - An example of cooperation for inclusive tourism: assessment of accessibility to passengers in Venice Port - C. Massaro, P. Tonin, F. Sensini, C. Gallo, N. Gianotti
- 259** 1018 - The Electronic Medical Record in Rehabilitation: Clinical integration and computerization of Rehabilitation Pathways in Neurology, Orthopedics and Cardio-Pneumology.... - R. Di Mizio, A. Ciarimboli, A. Del Monaco, R. Della Cagna, L. Del Sordo, C. Iannella, M.C. Penna, V. Vozza, G. Nalon, A. Pastorio, A. Rizzetto, F. Cortese.
- 259** 1019 - Disease and disability: the role of the physical medicine specialist in the definition of need and opportunities - G. Filippi
- 259** 1020 - Self-treatment of Lymphedema in the upper limb after breast cancer surgery - F. Coppadoro
- 260** 1021 - Effects of a 6 week pulmonary rehabilitation program in patients with chronic obstructive pulmonary disease (COPD) - A. Mojsije, I. Stojanovic Olivera, L. Milica
- 260** 1022 - Thalassotherapy methods in rehabilitation of patients with chronic venous insufficiency - N. Trukhacheva, V. Badtieva
- 260** 1023 - Confronto tra due diverse formulazioni di acido ialuronico per via intra-articolare nel trattamento della gonartrosi - A. Lucangeli, L. Marangon, M. Gugelmetto, M. Callegaro, D. Primon
- 260** 1024 - Rehabilitation Goals: Too Easy of Too Hard? - Fahim Anwar, Ahmad Al-Khayer, Bhupinder Panesar
- 261** 1025 - Effectiveness of combined treatment of botulinum toxin, biofeedback, electrical stimulation and physiotherapy in chronic pelvic floor - G. Ianieri, M. Ranieri, R. Marvulli, G. Tondi, S. Miccoli, L. Mastromauro, E. Romanelli, M. Megna, G. Megna
- 261** 1026 - UEMS PRM Section and Board webpages and e-learning activities - S. Moslavac, N. Barotsis, N. Christodoulou
- 261** 1028 - A comparison of therapy in localized lipodystrophy treatment - R. Saggini, L. Di Pancrazio, P. Iodice, V. Piscicella, R.G. Bellomo
- 262** 1029 - Integrated water treatment rehabilitation in occupational neck pain, myometry and EMGS investigation - P. Iodice, L. Di Pancrazio, V. Piscicella, G. Barassi, C. Aventaggiato, R.G. Bellomo, R. Saggini
- 262** 1030 - Postural ant-gravitational reprogramming in the elderly with flexed posture - R. Saggini, L. Di Pancrazio, V. Piscicella, P. Iodice, A. Marri, R. G. Bellomo
- 262** 1031 - Postural instability in Parkinson drug non-responder (atypical Parkinson) - R. Saggini, L. Di Pancrazio, P. Iodice, V. Piscicella, R. G. Bellomo
- 262** 1032 - Proprioception and prevention in dancers by VRRS training - R. Saggini, P. Iodice, L. Di Pancrazio, V. Piscicella, G. Barassi, R. G. Bellomo
- 263** 1033 - Retrospective study on long-term efficacy of ESWT treatment in rotator cuff syndrome - R. Saggini, L. Di Pancrazio, P. Iodice, V. Piscicella, R. G. Bellomo
- 263** 1034 - Stroke patient rehabilitation in acute and post-acute phases: relationship between primary motor cortex and mirror neurons during actions observation - L. Dicandia, C. Laurentaci, P. Bucci Brucato, C. Rondinone, P. Paradiso, M. Megna
- 263** 1035 - Comparison of the effects of upper extremity progressive resistive exercises and endurance exercises in the rehabilitation of patients with spinal cord injury - Dost Gulseren, Yıldırım Adem, Karabay ilkey, Dogan Asuman, Ozgirgin Nese
- 263** 1036 - Chronic low back pain, depression and functional impairment: a correlation study - A. Montez, P. Figueiredo, J. Páscoa Pinheiro, M. Quartilho, J. Branco
- 264** 1037 - Assistive devices prescriptions: an experience based on governance principles - Buonanno G., Balestreri PL, Giunta R., Lanzi R., Nicolini R.
- 264** 1038 - Developmental age and motor function levels in children with cerebral palsy - D. Asuman, A. Yıldırım, I. Karabay, G. Dost, N. Ozgirgin
- 264** 1039 - Prevention of hip dislocation in cerebral palsy: early multilevel minimally-invasive approach (E.M.M.A.) - N. Portinaro, A. Panou, F. Pelillo
- 264** 1040 - Clinical profiles of peripartum paralysis - Shaik Ahmed, Suzon Al Hasan, MA Shakoor, Maudul Islam
- 265** 1041 - Stress Fractures treated by ESWT - A. Notarnicola, L. Moretti, M. G. Maiorano, M. Forcignanò, S. Patella, L. Musci, B. Moretti
- 265** 1042 - Treatment of post-traumatic myositis ossificans by Extracorporeal Shockwaves Therapy - A. Notarnicola, S. Messina, P. Buselli, V. Coco, R. Saggini, F. Ciullo, L. Moretti, B. Moretti
- 265** 1044 - Management of osteoarthritis and the significance of patient education - E. Ilieva
- 266** 1045 - Italian multicenter data collection on Intrathecal Baclofen for Spinal Cord Injury (SCI): preliminary results till to 12 months follow-up visit - M. Menarini, V. Filipello, A. Massone, M. Cazzaniga, B. Lanzillo, M. P. Onesta, G. Stampacchia, R. Quatrane, S. Petrozzino, *et al.*, on behalf of Italian Spinal Cord Injury Board
- 266** 1047 - Severe acquired brain injury in Italy: data from the experimental National register - M. Khansefid, R. Avesani, P. Boldrini, M. Zampolini, M. Fedeli, A. De Tanti
- 266** 1048 - Special Characteristics of Prosthetic Rehabilitation of a Polytraumatized Patient - Case Study - I. Simanic, M. Teofilovski, I. Popovic, V. Ristic, M. Tomic, B. Vidakovic-Maksimovic
- 266** 1049 - Heterotopic ossification following cardiac arrest and hypoxic brain damage - M. Mackiewicz-Milewska, S. Jung, S. Borland, S. Lach-Inszczak, I. Szymkuć, J. Cieuciński, M. Cisowska-Adamiak, W. Hagner, W. Lasek (UK, Poland)
- 267** 1050 - Predictors of outcome in post-injury brain: Coma Recovery Scale-Revised (CRS-R) is a reliable tool to monitor disorders of consciousness and to predict clinical outcomes - M. Ebreo, M. Firera, G. Di Iasi, M. Storti, P. trovato, E. Mili, A Delli Gatti, S. Capomolla
- 267** 1051 - Heterotopic ossifications in severe brain injury: a prospective study - P. Trovato, G. Di Lasi, M. Storti, G. Storti, L. Metallo, M. Colella, C. Ioanna, A Delli Gatti, S. Brancaccio, S. Capomolla
- 268** 1052 - Outcome of intensive rehabilitation program in patients with severe brain injury - G. Di Iasi, M. Storti, P. Trovato, A. Delli Gatti, G. Storti, L. Metallo, C. Ioanna, M. Colella, A. Delli Gatti, S. Brancaccio, S. Capomolla
- 268** 1053 - The computer records of the department of rehabilitation - G. Quattrocchi, A. Consalvi, S. Sorce, P. Mandalari, V. Santamaria, S. Rosina, A. De Leo, G. De Luca, S. Colavita, G. Gazzara, G. Cilia, V. Nastasi, R. Trifirò, N. Fazio

- 268 1054 - Draft centralized service for prescription prosthetic and orthotic aids - G. Quattrocchi, V. Santamaria, A. Consalvi, P. Mandalari, S. Rosina, A. De Leo, G. De Luca, S. Colavita, G. Gazzara, G. Cilia, V. Nastasi, R. Trifirò, N. Fazio
- 269 1055 - Case report: eosinophilic fasciitis - L. C. Garrote-Moreno, E. Pellicer-Fernández, M. J. Llópez-García, C. Corrochano-García, E. G. Batañer-Peñafiel, E.A. Sevilla-Hernández, M. A. Moreno-Carrillo
- 269 1056 - Use of the surface emg in the rehabilitation of the peripheral neurolesion of facial nerve - G. Reggiani, C. Cazzola, I. Miselli, M. Vanini
- 269 1057 - Manual therapy versus mesotherapy in treatment of chronic neck pain - C. Costantino, S. Bertuletta, S. Minnella, E. Marangio
- 270 1058 - Impact of expiratory muscle weakness and ineffective cough on the decannulation protocols in Severe Acquired Brain Injury patients. Protocol study about the use..... - J. Navarro Solano, F. Colonna, C. Lanzilotti, N. Resta, R. Cicero, S. Anglani, V. Tagliente, G. Megna
- 270 1059 - A semg FRP analysis & 3-d skeleton model for neck and low back pain functional assessment - M. D'Amico, F. Ciarrocca, M. Paniccia, P. Roncoletta, M. Tomassini, M. Vallasciani
- 270 1060 - A multifactorial 3-D biomechanical skeleton model approach for posture and movement analysis: a 15 years activity review at Santo Stefano Rehabilitation Institute - M. D'Amico, M. Vallasciani
- 270 1061 - Predictive value of effect muscle electrostimulation and physiotherapy in the childhood flat foot - M. Ranieri, M. Sciuscio, S. Mennuni, R. Marvulli, A. Camporeale, D. Vittore, G. Megna
- 271 1062 - Acquired prosopagnosia: a case report - C. Fassio, M. Manera, F. Malinverno, C. Pistarini
- 271 1063 - Professional comfort and discomfort in a group of health assistance operators - M. Manera, I. Giorgi, C. Monaco, G. Maggioni, C. Pistarini
- 271 1064 - The social operator in a coma unit: the interaction with the territorial social healthcare net - O. Nervi, G. Maggioni, A. Caroli, C. Casarini, C. Pistarini
- 271 1065 - AWS incidence - F. Pessina, F. Micciché, C. Donetti, C. Costantino, M. Saccavini
- 272 1066 - Rehabilitation of patients with anterior cruciate ligament reconstruction - K. Ljubinkovic, M. Vukicevic, G. Gavrilovic
- 272 1067 - Rehabilitation of patients treated by arthroscopic stabilization for the anterior instability of the shoulder - M. Vukicevic, K. Ljubinkovic, G. Gavrilovic
- 272 1068 - Functional influence of Botulinum neurotoxin type A 150kDa treatment (Xeomin®) of multifocal upper and lower limb spasticity on chronic hemiparetic gait: a case report - M. Falso, R. Galluso, A. Malvicini
- 273 1069 - Spasticity in patients with severe acquired brain injury: an impairment that is poorly understood and poorly measured - L. Novelli, M. Falso, P. Bettini, R. Galluso, G. Monesi, A. Malvicini
- 273 1070 - Community action for inclusion in rural Nepal - S. Shrestha, N. Kaji, F. Colizzi, F. Cavallo
- 273 1071 - Notes from TUURU - M. Ricci
- 273 1073 - Review of the drugs for osteoporosis treatment - Şansin Tüzün
- 274 1074 - Intermittent Hypobaric Pressure in the therapy of microcirculation disturbances in Diabetics - G. Devečerski, B. Miličević, B. Novaković, N. Radaković, E. Mujić Skikić
- 274 1075 - The Effect of Sellas Laser for the Treatment of Hypertrophic Scars Contracture - K. Un Jang, J. Soo Choi, J. Youn Lee, J. Hyeon Mun, C. Hoon Seo
- 274 1076 - Rehabilitation of a patient with right pyramidal syndrome in combination with amputation of the upper half of the arm – Case-report - F. Armakola, A. Kotroni, M. Xenaki, K. Mihout, E. Papadaki, E. Manaos, E. Bakas
- 275 1077 - Evaluation of articular ROM after muscle relaxation with hydrotherapy in VS or MCS patients - A. Caroli, A. Lupo, E. Meazza, C. Zanga, G. Maggioni, G. Bellaviti, C. Casarini, R. Mauri, C. Pistarini
- 275 1078 - Evaluation of vital parameters and articular ROM after treatment with Erigo® in VS or MCS patients - G. Maggioni, A. Caroli, A. Lupo, E. Meazza, C. Zanga, G. Bellaviti, R. Mauri C. Pistarini
- 275 1079 - An approach of the secondary lower-limb lymphedema through manual scar treatment. Preliminary study - F. Gariboldi, L. Bedodi, R. Olivieri, A. Caraceni
- 276 1080 - Long term Outcome after TBI, is Mild Injury really mild? - R. Singh, G. Venkateshwara, S. Nair, R. Munjal, D. Datta
- 276 1081 - Agitation and Associated Features in Traumatic Brain Injury - R. Singh, G. Venkateshwara, S. Nair, R. Munjal, D. Datta
- 276 1082 - Disability index of post-mastectomy lymphedema: results of an italian study - M. Ricci, L. Sandroni
- 276 1083 - Microsurgery in the Prevention and Rehabilitative Treatment of Lymphedema: State of the Art - Campisi C., Boccardo F.
- 277 1084 - Guideline for outpatients treatment - D. Corda
- 277 1085 - Lipo-lymphedema rehabilitation - Etelka Földi
- 277 1086 - Elastocompression in breast-cancer related lymphoedema (BCRL) - Isabel Forner-Cordero
- 277 1087 - Physical treatment of phlebo-lymphoedema: European Consensus - O. Leduc, A. Leduc
- 277 1088 - Priority in therapeutic strategies - Michelini S., Failla A., Cardone M., Moneta G., Fiorentino A., Cappellino F.
- 278 1089 - Combined treatment of lymphoedema: the best place for each partner in a real team - A. Pissas, R. Rubay, E. Prieur, M. Adriaens
- 278 1090 - Evidence based medicine in the diagnosis and management of hand osteoarthritis - Fitnat Dincer
- 278 1091 - Course and Prognosis of Neck Pain in the General Population, in Workers and in Whiplash-Associated Disorders (WAD) - L. Carroll
- 279 1093 - Clinical view on ambulation in patients with Spinal Cord Injury - S. Moslavac
- 279 1096 - Action observation in the Rehabilitation of post acute Stroke and its origin in the concept of mirror neurons: preliminary data of RCT - M. Franceschini
- 279 1097 - Early Rehabilitation in haemiplegic patients - M. Mandić, M. Spalević, N. Rančić
- 279 1100 - Adaptational changes in the dominant shoulders of female competitive overhead athletes - Tonin K., Stražar K., Vidmar G., Burger H.
- 280 1101 - Do clinical measures of maltracking correlate to weight bearing patellofemoral joint orientation from MRI? H. Collado, J.M. Viton, A. Delarque, T. Besier, M. Fredericson

ABSTRACT BOOK

About the role of neuropsychologist at an early stage of neurorehabilitation

N.A. Varako, I.S. Kulikova, V.D. Daminov

National Pirogov centre of therapy and surgery, Russia, Moscow

Introduction. Neurorehabilitation of patients in acute stage of disease is rather young direction. Nevertheless the world practice shows the actuality and effectiveness of such activity (including cases of vegetative state and coma). So, neuropsychological rehabilitation – as a part of complex neurorehabilitation process – aimed at, first of all, mental activity disinhibition, setting an effective contact with a patient, his mental state stabilization, becomes actual. **Aim.** research of neuropsychological rehabilitation capabilities at mental activity recovery process in acute state after brain injury. **Materials and methods.** In 2007-2009 on the basis of Pirogov National Medical Surgery Centre (Medical Rehabilitation Department) the complex neuropsychological work was carried out with 30 patients (25-76 y.o.) with ischemic stroke, hemorrhagic stroke and severe TBI. The patients in acute period of disease (including vegetative state) were involved in the investigation. The work started usually in the resuscitation unit. The contact with the patients was impeded by conscious and mental activity derangements.

The neuropsychological work was carried out in two directions: the first one – general mental activity disinhibition and the second one – getting into the contact effectively and work with emotional state. *General disinhibition* supposed influence upon the patients by various stimuli: visual (immovable and moving objects and images) auditory (discrete speech and non-speech sounds, melodies, popular music, addressing to the patient), tactile (touching, stimulation by objects of various shape, size, material – for example, putting objects in hands). The stimulus material was selected, where possible, taking into consideration the premorbid peculiarities of the patients (something, that could arouse interest and positive emotions in them). It is known, that sensorial deprivation makes pernicious influence on mental well-being of even healthy person, all the more so on a patient with brain damage. At the same time, according to the circumstances, the external stimulation of the patients reduces deeply, and this leads, in its turn, to additional sensorial deprivation. That is why it is particularly important to provide various purposeful stimulation in order to keep and “provoke” mental activation. *Getting into the contact* supposed working out the system of actions promoting full contact with a patient. As a result of severe neurodynamic disturbances not only getting into the contact, but often maintaining it (even during several seconds) was also difficult for such category of patients. This task was solved by the way of repeated long interaction with a patient (hail, calling by name, calling from different sides, with various intonation, visual contact, various speech information) and repeated stimulation (using wide range of different modality stimuli) combined with spaces of brief rest. So, the main principle was alternation of attempts of active interaction, stimulation – and rest, during a particular time interval (usually 15-30 minutes). After the stable contact had been set, in cases where speech was not possible or seriously damaged the task of working out the effective ways of communication was solved with the help of gestures and signs systems. **Results.** Neuropsychological work in these two directions showed to be rather effective. The described actions aroused response from the patients: mental activation was observed as response to new, bright, unexpected stimuli (of different modality), and emotionally significant stimuli. Thus, it is significant to mention about situations, when activation became much more evident, than it was without such stimulation, and also when new reactions appeared and then consolidated (which were not observed before): in cases of contact difficulties because of severe neurodynamic disturbances it was the repeated long influence with alternation of stimulation and rest what helped. There were cases, where the contact with a patient was for the first time set in the described way, while there was no response for single stimulation. This is most probably the consequence of a long period of “switching on” of the patients in such condition. **Conclusion.** So, it is significant to note the importance of early start of neuropsychological rehabilitation, purposeful stimulation and overcome sensory deprivation to recover mental functioning of patients in acute state. The following methods of work were effective: the purposeful use of new, bright, unexpected, emotionally significant stimuli; the uninterrupted alternation, at rather a long duration, of stimulation and spaces of rest.

The usage of VocaStim device in rehabilitation of the patients with dysphagia and dysphonia

A. Obukhovskaya

Clinical neuropsychologist, speech therapist, National Pirogov centre of therapy and surgery, Russia, Moscow

Physiotherapy is rather popular in various spheres of neurorehabilitation. A relevant question is the appliance of electrostimulative devices when various pathologies of speech and voice are being diagnosed and cured. The VocaStim device is the first to realize the idea which allows diagnosing and curing the paresis of larynx, plica vocalis or the muscles of the speech apparatus. Electrodiagnosis allows us to estimate the qualitative and the quantitative sense of the neuromuscular functions. By means of using electrostimulation, depending on the kind of the current and chosen parameters, it is possible to improve blood circulation, to stimulate the nutrition of the muscles and build them up in case of atrophy, to stimulate the neural tissue in cases of peripheral or central paralysis, or to perform anesthetization and electrophoresis in order to transfer medical products in tissues. **Introduction.** The aim of this report is to show the effectiveness of using the VocaStim device in rehabilitation of the paresis of larynx and plica vocalis. **Materials and methods.** Diagnostic and medical procedures have been carried out during a year with the help of the VocaStim device. There were total of 87 patients observed, 48 of them having hypotonic dysphonia and 39 suffering from bulbar dysarthria, dysphagia. The procedures lasted from 10 to 20 days, 2 times a day. During electrostimulation patients had to perform speech gymnastics and speech therapy. **Results.** The objective analysis of the results presented by the VocaStim device allows to define the condition of the neuromuscular tissue and differentiate the level of innervation. Repeated diagnosis carried out at the end of the treatment course shows dynamics towards recovery of the affected muscles. Due to the research, considerable improvement of the patients with speech problems was marked after 2-3 séances. The phonation time increases, the voice becomes stronger, the level of hoarseness lowers and the patient is able to continue speaking for a longer time without being tired. Considerable improvement of the patients with dysphagia was marked after 10-12 séances. Swallowing difficulties disappear. The level of hyperptyalism is lowered, the condition of the muscles of the speech apparatus and trophism are improved. **Conclusion.** All things considered, it is essential to point out that the usage of the VocaStim device in addition to the classical logopaedics methods allows to reach positive results in shorter rehabilitation periods.

Rehabilitation robotics of patients in intermediate period of spinal cord trauma

N.V. Rybalko, I.G. Gorochova, E.V. Zimina, V.D. Daminov

National Pirogov centre of therapy and surgery, Russia, Moscow

The **aim** of our research was to study dynamics of clinical symptoms and psychological status of patients in intermediate period of spinal cord trauma at the time of gait recovery applying robotic devices Erigo and Lokomat. **Material and method.** The paper presents a clinical and neuropsychological examination of 68 patients in intermediate period of spinal cord trauma in motor-incomplete spinal cord injury. The cohort was divided into two groups: the 1st one included 48 patients who had standard rehabilitation program and trained applying robotic devices Erigo and Lokomat. The 2nd group had 20 patients and only standard rehabilitation program. To estimate neurological status we used American Spinal cord Injury Association scale. To evaluate psychological status we used Beck depression scale, Spilberger State-trait anxiety scale, Sheehan anxiety scale. **Results.** Before the beginning of rehabilitation program changes in psychological status were revealed in both groups patients. For the time of rehabilitation measures we found positive changes in psychological status of all patients. Maximum reduction of movement disorders and improvement of psychological status were marked in the group of patient had trained with the help of Erigo and Lokomat. **Conclusion.** Including in the rehabilitation program robotic devices Erigo and Lokomat allows to reach restoration of motor functions and optimization of psychological status in larger volume, than use only standard program of rehabilitation.

References

1. Lam T, Anderschitz M, Dietz V. Contribution of Feedback and Feedforward Strategies to Locomotor Adaptations. *J Neurophysiol* 95; 766-773, 2006.
2. Tansey K. Neural plasticity and locomotor recovery: robotics in research. *International Neurorehabilitation Symposium* 2009.

Central and cerebral blood flow estimation of patients in acute stroke applying tilt-table Erigo

V.D. Daminov, N.V. Rybalko, A.N. Kuznetsov
Russia, Moscow

The **aim** of our research was to evaluate the effectiveness of rehabilitation robotics in acute stroke period and to estimate central and cerebral blood flow of patients in acute stroke applying robotic device Erigo. **Materials and methods.** One hundred patients with hemiparesis in acute stroke have been examined and being divided into two groups: the 1st one included 60 patients had standard course of rehabilitation therapy and trained with the help of Erigo, 40 patients of the 2nd – control group had only standard rehabilitation program. We used 6 marks paresis degree scale, Barthel ADL Index and Rehabilitation activities profile scale to estimate the effectiveness of rehabilitation. Hemodynamics monitoring have been performed with the help of impedance cardiography and transcranial Doppler ultrasonography in one of the middle cerebral artery. **Results.** For the time of rehabilitation measures the middle mean of muscle's strength in damaged inferior extremity increased in the 1st group patients on 2,1 marks, in the 2nd group patients on 1,2 marks. During rehabilitation therapy Barthel ADL Index grew on 27 marks in the 1st group and on the 15 marks in the 2nd. More significant dynamics in Rehabilitation activities profile scale was represented in the 1st group. After rehabilitation course there was no meaningful changes of central and cerebral blood flow indexes in both groups patients. Moderate elevation of cerebral blood flow rate and decreasing of peripheral vascular resistance i.e. magnification of cerebral perfusion was fixed during the training procedure on Erigo. Positive effect on cerebral blood flow indexes of Erigo trainings was represented. **Conclusion.** Early mobilization with tilt table "Erigo" provides restoration of motor functions in larger volume, than use only standard program of rehabilitation. Arterial blood pressure and cerebral blood flow indexes remained within standard that proves the safety of the method. Application of tilt table "Erigo" has positive influence on the cerebral blood flow.

References

1. Rupp R, Plewa H, Schuld C. Physiological mobilization of very acute SCI patients effects on the cardiovascular system. International Neuro-rehabilitation Symposium 2009.
2. Muller F. Therapy with unconscious patients on the Erigo compared to conventional tilt table. International Neurorehabilitation Symposium 2009.

Low-energy extracorporeal shock wave therapy as a treatment for medial tibial stress syndrome

Jan D. Rompe¹, A. Cacchio², J.P. Furlia³, N. Maffulli⁴

¹OrthoTrauma Evaluation Center, Mainz, Germany.

²Dipartimento di Medicina Fisica e Riabilitazione, Ospedale "San Salvatore" di L'Aquila, L'Aquila, Italy.

³SUN Orthopaedics, Lewisburg, PA, USA.

⁴Centre for Sports and Exercise Medicine, Barts and the London School of Medicine and Dentistry, London, Great Britain.

Introduction. Medial tibial stress syndrome (MTSS) is a pain syndrome along the tibial origin of the tibialis posterior or soleus muscle. Extracorporeal shock wave therapy (SWT) is effective in numerous types of insertional pain syndromes. **Materials and methods.** In a case control study (Level of evidence, 3) forty-seven consecutive subjects with chronic recalcitrant MTSS underwent a standardized home training program, and received repetitive low-energy radial SWT (2000 shocks; 2.5 bars of pressure which is equal to 0.1 mJ/mm², total energy flux density, 200 mJ/mm², no local anesthesia) (treatment group). Forty-seven subjects with chronic recalcitrant MTSS were not treated with SWT, but underwent a standardized home training program only (control group). Evaluation was by change in numeric rating scale (NRS). Degree of recovery was measured on a 6-point Likert scale (subjects with rating -completely recovered- or -much improved- were rated as treatment success). **Results.** One month, 4 months, and 15 months from baseline, success rates for the control and treatment groups according to the Likert scale were 13% and 30% (p<.001), 30% and 64% (p<.001), and 37% and 76% (p<.001). One month, 4 months, and 15 months from baseline, the mean NRS for the control and treatment groups were 7.3 and 5.8 (p<.001), 6.9 and 3.8 (p<.001), and 5.3 and 2.7 (p<.001) respectively. At 15 months from baseline, 40 of the 47 subjects in the treatment group had been able to return to their preferred sport at their pre-injury level, and 22 of the 47 control subjects. **Conclusion.** Radial SWT as applied was an effective treatment for MTSS.

Home training, local corticosteroid injection or radial shockwave therapy for greater trochanter pain syndrome

J.D. Rompe¹, N.A. Segal², A. Cacchio³, J.P. Furlia⁴, A. Morral⁵, N. Maffulli⁶

¹OrthoTrauma Evaluation Center, Mainz, Germany.

Email: profrompe@web.de

²Department of Orthopaedics & Rehabilitation, University of Iowa, Iowa City, IA, USA.

³Dipartimento di Medicina Fisica e Riabilitazione, Ospedale "San Salvatore" di L'Aquila, L'Aquila, Italy.

⁴SUN Orthopaedics, Lewisburg, PA, USA

⁵Centre de Fisioteràpia Salut i Esport (Sta. Perpètua), EUIFN Blanquerna, Barcelona, Spain.

⁶Centre for Sports and Exercise Medicine, Barts and the London School of Medicine and Dentistry, London, Great Britain.

Introduction. There are no controlled studies testing the efficacy of various non-operative strategies for treatment of greater trochanter pain syndrome. **Materials and methods.** In a randomized controlled clinical trial (Level of evidence, 2) 229 patients with refractory unilateral greater trochanter pain syndrome were assigned sequentially to a home training program, a single local corticosteroid injection (25 mg prednisolone) or a repetitive low-energy radial shockwave treatment. Subjects underwent outcome assessments at baseline and a 1, 4, and 15 month follow-up. The primary outcome measures were degree of recovery, measured on a 6-point Likert scale (subjects with rating -completely recovered- or -much improved- were rated as treatment success), and severity of pain over the past week (0-10 points) at 4 month follow-up. **Results.** At 1 month from baseline the results after corticosteroid injection (success rate 75%; pain rating: 2.2 points) were significantly better than after home training (7%; 5.9 points) or shockwave therapy (13%; 5.6 points). Regarding treatment success at 4 month follow-up, radial shockwave therapy lead to significantly better results (68%; 3.1 points) than home training (41%; 5.2 points), and than corticosteroid injection (51%; 4.5 points). The null hypothesis was rejected. Fifteen months from baseline, radial shockwave therapy (74%; 2.4 points) and home training (80%; 2.7 points) were significantly more successful than the corticosteroid injection (48%; 5.3 points). **Conclusion.** The role of corticosteroid injection for GTPS needs to be reconsidered. Subjects should be properly informed about the advantages and disadvantages of the treatment options, including the economic burden. The significant short-term superiority of a single corticosteroid injection over home training and shockwave therapy declined after one month. Both corticosteroid injection and home training were significantly less successful than shockwave therapy at 4 month follow-up. Corticosteroid injection was significantly less successful than home training or shockwave therapy at 15 month follow-up.

Eccentric loading versus eccentric loading plus shock wave treatment for mid-portion Achilles tendinopathy: a randomized controlled trial

J.D. Rompe¹, J.Furlia², N. Maffulli³

¹OrthoTrauma Evaluation Center, Mainz, Germany.

²Sun Orthopaedics Group, Lewisburg PA, USA.

³Centre for Sports and Exercise Medicine, Barts and the London School of Medicine and Dentistry, London, Great Britain.

Introduction. Results of a previous randomized controlled trial had shown comparable effectiveness of a standardized eccentric loading training and of repetitive low-energy shock wave treatment (SWT) in patients suffering from chronic mid-portion Achilles tendinopathy. No randomized controlled trials tested whether a combined approach might lead to even better results. **Materials and methods.** To compare the effectiveness of two management strategies - Group 1: eccentric loading; Group 2: eccentric loading plus repetitive low-energy shock wave therapy - 68 patients with a chronic recalcitrant (> 6 months) noninsertional Achilles tendinopathy were enrolled in a randomized controlled study (Level of evidence, 1). All patients had received unsuccessful management for > 3 months, including at least a) peritendinous local injections; b) non-steroidal anti-inflammatory drugs; and c) physiotherapy. A computerized random-number generator was used to draw up an allocation schedule. Analysis was on-intention-to-treat basis. **Results.** At 4 months from baseline, the VISA-A-Score increased in both groups, from 50 to 73 points in Group 1 (eccentric loading), and from 51 to 87 points in Group 2 (eccentric loading plus shock wave treatment). Pain rating decreased in both groups, from 7 to 4 points in Group 1,

from 7 to 2 points in Group 2. 19/34 patients of Group 1 (56%) versus 28/34 patients of Group 2 (82%) reported a LIKERT scale of 1 or 2 points ("completely recovered" or "much improved"). For all outcome measures, group 1 and 2 differed significantly in favour of the combined approach at the 4-month follow-up. At 1 year from baseline there was no difference any longer, with 15 failed patients of Group 1 opting for having the combined therapy as cross-over, and with 6 failed patients of Group 2 having undergone surgery. **Conclusion.** At 4-month follow-up, eccentric loading alone was less effective when compared to a combination of eccentric loading and repetitive low-energy shock wave treatment.

New rehabilitation technology for patients with motor coordination disorders

E.V. Zimina, E.V. Bugorsky, V.D. Daminov

Speaker: Ekaterina Zimina, National Pirogov centre of therapy and surgery, Russia, Moscow

The few fundamentally new methods were developed during last decade that considerably change the efficiency of the modern rehabilitation therapy. The use of the BrainPort™ Balance device, originally designed for vestibular rehabilitation, is the essentially new direction for treatment of various forms of the ataxia. Recently, only few clinics in Europe, North and South America published results about the effectiveness of this technology and possible its underlying mechanisms. **The purpose and goal** of current study were research of the effectiveness of the above method in application to various motor coordination affected patients. **Materials and methods.** We tested 46 patients in aging group 22-64 years old. Thirty-two patients were in an early stage of recovery after an ischemic stroke in vertebral - basilar area and 14 multiple sclerosis patients with spinocerebellar lesions in a remission stage. All patients had motor coordination disorders that were expressed in different form of ataxia. The standard training regimen was applied: 20 minutes training sessions daily during 10 consecutive days. We suggested two procedural options: standing on the soft surface (cushion 1 cm. high) or sitting on the balance ball (in case when patient couldn't keep a vertical stance during 20 minutes). Immediately before training sessions we applied a special set of physical therapy procedures that include: breathing exercises, balance and coordination exercises learn to swallow with a closed mouth, elements of manual therapy – miorelaxation, to improve the affected stato-kinematic stereotype. As **results** of applied procedures, nine patients noticed the diminish of dizziness, they better performed the coordination testing probes, demonstrated improved gate functions as a result of ataxia decline. In two stroke patients and four multiple sclerosis patients we did not notice significant changes in clinical conditions. We noticed two kinds of positive clinical effects: short-term retention effect that continued in a matter of minutes and long-term retention effects that continued during hours and even days. The shortest retention effects were obtained usually during first two training days. After first five days of training the average duration of the retention effects in 4-5 hours, initiated by single 20 minute session was observed in 12 stroke patients and eight patients with multiple sclerosis. To verify results, the quantitative measurements of the patient balance were performed using a "StabMed" – the computerized complex for stabilography with biological feedback. Before and after training procedures we did perform standard Romberg tests and calculate the dispersion of a center of pressure in frontal and sagittal planes and its average velocity of displacement. As the result of applied therapy, we notice the decrease of frontal dispersion with open eyes in average at 4.56 mm, with closed eyes at 3.14 mm, the decrease of sagittal dispersion at 6.28 mm and 4.37 mm correspondingly. We also registered the decrease in average velocity of the center of pressure at 8.14 mm/s at eyes open and 5.23 mm/s with eyes closed conditions. **Conclusions.** Therefore, the use of BrainPort technology can help to decrease the a pronounced ataxia symptoms in patients included in our study. More extensive research has to be done in the future to discover possible underlying mechanisms of such effects and to increase the efficiency and power of the rehabilitation.

One support and care getting better quality of his life

C. Mirabelli, P. Casanova, G.Valdenassi

Servizio Recupero e Rieducazione Funzionale (Sede Novi Ligure, AL)

Introduction. We have analyzed a Duchenne Distrophy case in very later phase by team approach (physician, physical therapy

orthopedic technician), in different aspect of daily living.

Materials and methods. We must consider his posture: inclined and turned his pelvis, no postural control to right pelvis adduced turned inside to left various, in abduction; right foot various, to left was valgus, upper limbs were in abduction and turned outside in order to drive by wheelchair the patient leaned forward his trunk and put on her table where her joystick was. The patient must correct his posture by: an electronic wheelchair, with central traction during by a very small and particular joystick planed function



a postural system made by – elastic polyurethane cushions preventive decubitus ulcers. **Results.** In our patient we have obtained two important factors: from the other side it was better perceived general health such as he was pleased seating long daily living with her elec-



tronic wheelchair with central traction; to the other side, he had a positive impact role in the lives with severe disability independence on other ADL and getting better her life in different aspect: well-being, effect of rehabilitation treatment, and psychological stressors. The postural system with be-elastic cushions was useful for decreasing pain, reduce decubitus ulces, and positive perceptions of impact on users and it was stable over time; instead of the comfortable device it was better for a correct respiratory compliance, and swallowing. **Conclusion.** The patient is pleased during seating and comfortable for a great weight of pain.

References

1. Birmingham J. Case Management, Jan-Feb. 13, 7-16, Medicare Boston, 2008.
2. A. Caracciolo, M. Ferrario "Seating clinic" Fond,Don Gnocchi Milano, 1999.
3. Iquola SF-36 Italian Version (Istituto Mario Negri).
4. Sthewart C. P.U.S. Physiological consideration in seating. Prosthet. Orthop. Int. 15, 193–198.

Assistive tecnology from adapted equipment to inclusive environments

Introduction. Bone stress injuries are common overuse injuries seen in active people. The pathogenesis is multifactorial and usually involves repetitive submaximal stresses. No comprehensive studies describing rehabilitation protocol of bone stress injury of the talus have been published. We aimed to describe a conservative treatment protocol for bone stress injury of talus. **Study Design.** Case series **Material and methods.** The rehabilitation and pain features in 15 patients bone stress injury of the talus, as confirmed by magnetic resonance imaging MRI, were reviewed retrospectively. **Results.** Of the 15 patients (8 female and 7 male; age range 16-50 years; median age 29.1 years) mean duration of symptoms was 2.5 wk (1 to 12 wk) MRI studies showed bone marrow edema in the talus in six cases whereas in other 9 cases (5/15 calcaneus, 3/15 navicular, 1/15 cuboideum) adjacent osseous structures were affected as well. In

four cases the entire talus was involved, and in eleven cases only a portion of the bone was affected. Mean visual analogue scale for pain before treatment was 53.5mm. The median duration of walking boot usage is 16.2 (7 to 70) days. Patients became symptom free in a mean of 23.2 (12-40) days. 10 patients returned to daily life and sportive activities without difficulty.

Ankara Rehabilitation Protocol for Bone Stress Injury of the Talus

- Rest and /or activity modification is required to reduce symptoms to a level that can achieve pain-free activity
- Gentle non-weight bearing exercises; active range of motion and isometric exercises can begun in first week
- Acute pain usually resolves in the first 2 weeks.
- Add modalities:
 - Ultrasound
 - TENS
 - Whirlpool
- A removable walking boot used for 2-3 week. Boot removed during ROM exercises four to six times a day.
- Crutch-assisted ambulation for the first 20 days. Weight-bearing is progressed from as tolerated in boot with crutches to weight-bearing in boot only. Pain is the guiding factor for progression of weight-bearing. At 3 week, weight bearing without crutches is allowed in the boot as tolerated.
- Proprioception exercises with board, balance activities, progress to open-chain strengthening with therabands can start as pain allows on 3 weeks.
- Stationary bicycling is begun when the patient tolerates ambulation comfortably.
- High-impact exercises are held until patient has been completely asymptomatic for 1-2 week.

Conclusion. Early diagnosis and appropriate conservative treatment allow for a favorable outcome in most cases

References

Nural Albayrak Aydin, Kamil Yazicioglu. The Rehabilitation Protocol For Bone Stress Injury Of The Talus.

Application of kinesio taping on the patients with leg paresis and recurvatum after acute ischemic inslult

L. Nikcević¹, A. Plavšić², N. Mujović³, M. Hrklović⁴, Z. Brdareski⁵, L. Konstantinović⁶, J. Vasić⁷

¹Special Hospital for cerebrovascular diseases pf brain "St Sava", Nemanjina 2, Beograd, Srbija

²Tor Vergata University of Rome

³Clinical Centre of Serbia, Belgrade

⁴Institute for Rehabilitation Belgrade

⁵Military Medical Academy, Belgrade

⁶Clinic for Rehabilitation " Dr Miroslav Zotović", Belgrade

⁷Institute for Medical Care of the workers of "Railway Serbia", Belgrade

Kinesio taping is used for improvement of the function of muscular-skeleton weakness of different aetiology and it finds it place in rehabilitation as a part of kinesio programme-Reduction of pain, improvement of the muscle power and enzyme activity, improvement of static and stability during standing and walking, accelerates early rehabilitation treatment and the return of a patient to everyday activities of life and work. **The aim of the paper.** Determination of the importance of application of kinesio taping of the patients with leg paresis and recurvatum of the knee after acute ischemic insult during early rehabilitation. **Material and methods.** The prospective study included 200 male patients treated at the St Sava Hospital in the period 01/06/09-01/08/09. The average age of patients was 62± 7. The study included patients who have weakness of the leg-paresis for the first time and smaller degree of the arm. Patients were divided into two groups. GROUP A included patients treated by classical rehabilitation kinesio programme and the GROUP B patients with Kinesio taping within the rehabilitation programme. The rehabilitation with the kinesio taping started on the first day of rehabilitation, according to the individual plan (100 patients on m.Quadriceps Femoris, 24 m Rectus Abdominis, 32 mBiceps Femoris,68 m Quadratus Lumborum) and the tapes were changed every 3-4 days all 60 days. Kinesio programme in both groups was performed 5 days a week, 30-40 min during early rehabilitation and twice 30-40 min a day in secondary rehabilitation. Estimation of the seriousness of the neurological deficit was done by the FIM test at the beginning and in the end of early rehabilitation and after 60 days. Separately, the parameters WALKING and the ability to climb the stairs were observed. Berg's functional scale of balance was done at the beginning and in the end of early rehabilitation, as well as after 60 days. The statisti-

cal methods included: frequencies, percentage, average values, meidana, standard deviation, scope, Ficher exact test, Wilcoxon rank sum test with continuity correction and Asymptotic Wilcoxon rank sum test and Bonferroni correlation. **Results.** In the whole group of patients the values of the parameters FIM Total, WALKING, STAIRS and the Berg's scale measured in the moments 0,14,60 are statistically significantly increased (Friedman rank sum test; $\chi^2=398,01$; $p < 2.2 * 10^{-16}$). At the beginning of testing, there is no statistically important difference in values FIM Total and FIM WALKING between groups A and B. Value parameters STAIRS 0 and Berg's scale 0 are statistically significantly lower in Group A in comparison to Group B. After 14 days, the values of the parameters FIM Total and WALKING are statistically significantly higher in Group B in comparison to Group A. The Trend is remaining the same after 60 days. Values of the parameter Stairs 14 and 60 and Berg's scale 14 and 60 are significantly lower in Group A in comparison to Group B. **Conclusion.** Our results undoubtedly confirm the place of Kinesio Taping in early rehabilitation after acute ischemic insult of the patients with the leg paresis in faster maintenance of balance and walking. Kinesio Taping is applied according to the protocol of the International association leads to faster functional recovery, stability in walking and climbing the stairs of he patients with recurvatum of the knee after acute ischemic stroke.

Reference

1. A.Hostman et al.Muscle function of knee extensors and flexors after stroke is selectively impaired at shorter muscle lengths.J Rehabil.Med 2009;41:317-321
2. Ada L,Canning CG,Low SL.Stroke patients have selective muscle weakness in shortened range.Brain 2003;126:724-731
3. Nosaka.K.(1999).The effect of Kinesio Taping on Muscular Micro-Damage Following Eccentric Exercises.15th Annual Kinesio Taping International Symposium Review.(pp.70-73) Tokyo,Japan:Kinesio taping Association.
4. Munawa Wanjuru.How a Kinesio Tape Will
5. H.M.Murray (2000).Effects of Kinesio Taping on Muscle Strength after ACL-Repair.Journal of Orthopedic and Sports Physical Therapy,30,1.
6. K.Kase.1994.Illustrated Kinesio Taping,3rd,Ed.,Ken 'l Kai,Tokyo,pp 90-91.

Evaluation of motor development for cerebral palsy (CP) by use of the Gross Motor Function Measure (GMFM) and the Pediatric Evaluation of Disability Inventory (PEDI)

Hidetoshi Takahashi, Yasutomo Okajima

Department of Rehabilitation Medicine, Kyorin University, School of Medicine.

Introduction. GMFM is established and used to assess the functional motor abilities mainly for children with CP. PEDI is also developed to assess the objective activity of daily living for children with CP. Both are the only two instruments validated specifically as evaluative measures for CP. While widely used, they are limited by a ceiling effect when assessing higher-functioning children. The PEDI is further restricted to children who are 7 years old or less. The purpose of this study is to evaluate the relationship between GMFM and PEDI for children with CP. **Materials and methods.** We evaluated 22 children with CP. The age of them is from three to six y/o. We evaluated their motor function by GMFM and activity of daily living by PEDI. **Results.** There was significant correlation ($p < 0.05$) between the total score of GMFM and total self-care score of PEDI for CP children. However, total score of social skill of PEDI jumps up to high score if the total score of GMFM clears over the 50%. **Conclusion.** For CP children, there was higher correlation between GMFM and self-care score of PEDI. However, our data suggests that they need 50% of total GMFM score if they want to get social skills.

How to fight diabetic depression

S. Zeqiri¹, N. Zeqiri², N. Shala³, A. Ylli⁴, A. Bakalli⁵

¹University Clinical Center of Kosovo- Physical Medicine with Rehabilitation

²University Clinical Center of Kosovo- Internal Clinic

³University Clinical Center of Kosovo- Neurologic Clinic

⁴Univeristy Hospital Center Mother Teresa, – Internal Clinic, Albania

⁵University Clinical Center of Kosovo- Internal Clinic

Introduction. To feel frustrated is not something an unusual condition in diabetic patients. Diabetes is a chronic disease which is increasing and furthermore it includes all ages and both sex. As working team we have to think and work on maintaining and

improving health and quality of life for these patients. Physical activity is an excellent way to keep many parameters of this disease within normal range. Application of physical activity avoids the stress which affects: control of glucose level in blood, changes in the cardiovascular system, neuropathy and other problems which are manifested due to uncontrolled diabetes. The purpose of this study is complexly drafted: as primarily it aims at helping people and not letting them feel sick, to be more active and profitable in life, have a family without fear and stress, to have a nation of healthy and functional individuals. **Materials and Methods.** In our study we have included 96 patients with diabetes mellitus type 1 and 2, 58 of whom were females and 38 males. Physical activity was applied for 10 days, on treadmill for 15 minutes, bicycle for 15 minutes and walking for 30 minutes. All the patients have chosen the way of exercise. Before the beginning of exercise, blood glucose was measured, the subjective condition was determined through values 1 to 10, the general health condition of patients was assessed with other parameters which rate the actual condition (such as blood pressure, breath frequency, etc). **Results.** In results we presented rates of subjective situation and also rates of glycemia in patients with diabetes type 1 and 2, where physical activity has been applied for 10 days continuously. In rates of subjective situation we found an increase of rates in males' type 1 for 2.7, in type 2 for 2.9, and in females we had increase of rates in type 1 for 2.6, and type 2 for 2.8. In rates of glycemia we had a decrease to males' type 1 for 1.021 mg/dl, type 2 for 1.66mg/dl; to females we had decrease in type 1 for 1.459 mg/dl and type 2 for 1.894 mg/dl. **Conclusion.** Values obtained in this study demonstrate that physical activity is an important issue for diabetics. Physical activity has been accepted well by patients and was applied with their will, and by noting improvement of their situation in subjective condition, decrease of glycemia rates and improvement of their body strength have convinced them to continue with physical activity. To have a quiet personal and family life, physical activity should be applied based on reasonable will of diabetics. Physical activity has to be a main component of lifestyle in diabetic patients. Application of physical activity gives us a big hope in field of life stability and social life for diabetics.

References

1. Wasserman DH, Vranic M: Exercise diabetes in (Eds) Alberti KGMM and Krall LP: The Diabetes Annual/4, Elsevier Science Publishers, 116-143, and 1988.
2. Ahleborg G, Felip P, Hagenfeldt L et al: Substrate turnover during prolonged exercise in man. *J. Clin. Invest*, 53: 1080-1086, 1974.
3. Lustmann PJ, Griffith LS, Clouse RE. Depression in adults with diabetes: Results of a 5 - year follow-up study. *Diabetes care* 1988, 11: 605-612.
4. Littlefield CH, Rodin GM, Murray MA, Craven LJ. Influence of functional impairment and social support on depressive symptoms in persons with diabetes. *Health Psychology* 1990; 9:737-749.

Plantar Fascia-Specific Stretching versus Radial Shock Wave Therapy as Initial Treatment of Plantar Fasciopathy

J.D. Rompe¹, A. Cacchio², Lowell Weil Jr.³, J.P. Furia⁴, J. Haist⁵, V. Reiners⁶, C. Schmitz⁷, N. Maffulli⁸

¹OrthoTrauma Evaluation Center, Mainz, Germany.

²Dipartimento di Medicina Fisica e Riabilitazione, Ospedale "San Salvatore" di L'Aquila, L'Aquila, Italy.

³Weil Foot & Ankle Institute, Des Plaines, IL, USA.

⁴SUN Orthopaedics, Lewisburg, PA, USA.

⁵Orthopädie im Gesundheitszentrum, Alzey, Germany.

⁶Orthopädie im Gesundheitszentrum, Alzey, Germany.

⁷Electro Medical Systems S.A., Nyon, Switzerland.

⁸Centre for Sports and Exercise Medicine, Barts and the London School of Medicine and Dentistry, London, Great Britain.

Background. Whether plantar fascia-specific stretching (PFSS) or shock wave therapy (SWT) are effective as initial treatment for proximal plantar fasciopathy (PF) remains unclear. **Aims.** To test the null hypothesis of no difference in the effectiveness of PFSS or SWT for patients with a previously untreated unilateral PF of up to six-week duration. **Materials and methods.** 102 patients with acute PF were randomly assigned to perform an eight-week PFSS program (Group I, n=54) or to receive repetitive low-energy radial SWT without local anesthesia, administered weekly for three weeks (Group II, n=48). All patients completed the seven-item pain subscale of the validated Foot Function Index (PS-FFI) and a subject-relevant outcome questionnaire (SROM). Patients were evaluated at baseline, and at two, four, and fifteen months from baseline. Primary outcome measures was mean change of the PS-FFI sum score at two

months from baseline, mean change of item '2' (pain during first steps) of the PS-FFI, and response rate of question #6 of the SROM (satisfaction with treatment). Analyses were performed on intention-to-treat. **Results.** No difference in mean age, gender, weight, duration of symptoms was found between the groups at baseline (all $p > 0.1$). At two months from baseline, the PS-FFI sum score showed significantly greater changes for the patients managed with PFSS than those managed with SWT ($p = 0.001$), as well as individually for item '2' ($p = 0.002$). Thirty-five patients in Group I (65%) vs. fourteen patients in Group II (29%) were satisfied with the treatment (SROM question #6; $p = 0.001$). At four months, analysis of the PS-FFI, and of the response rates to the SROM questionnaire revealed persisting significant differences in favor of Group I. At 15 months from baseline, there was no significant between-group difference. **Conclusion.** A program of non-weight-bearing stretching exercises specific to the plantar fascia is superior to repetitive low-energy radial shock wave therapy for the treatment of acute symptoms of proximal plantar fasciopathy.

Do services that respond to perceived needs allow people to take up their lives where they left off?

Traumatic brain injuries (TBI) represent a real public health problem, a silent epidemic. The treatment and management of persons with TBIs pose significant challenges to the health system and payer organizations. The treatment and management of persons with TBIs represent a major challenge to the health system and to payer organizations, both in Québec and France¹. **Objectives.** This project was conducted in Québec and France in order to make an empirical assessment of the extent to which care services respond to the expressed needs of persons with TBIs, their family and friends and their loved ones and capture the points of view of health professionals. More specifically, the project identified areas where the service offers in Québec and France are similar and where they differ, and sought a better understanding of the perceptions of actors in these networks concerning the quality of fit between the needs of persons with TBIs and their loved ones and the services provided. **Methodology.** The study has a qualitative design and was carried out in three regions of France (Île de France, Bordeaux and Lyon/St-Etienne) and three regions of Québec (Greater Montréal, Outaouais and Abitibi). The data was collected from focus groups with 150 participants, including persons with TBIs, their loved ones and their caregivers. The participants were assigned to 18 focus groups. The data collected was on: the needs in different phases of a care episode, the services that do or do not respond to these needs, and innovative interventions that could support adjustment and social inclusion strategies and should be included in programs for TBI clients. The interview guide addressed these specific issues. Data from different groups were compared in order to develop a portrait of the state of services provided to TBI clients in France and Québec. A comparison of the different contexts that can influence rehabilitation and social reintegration in Québec and France provides information on the types of services available and the conditions of access to services. **Results.** The results present areas of convergence and divergence according to the various themes that emerged during the analyses (information, support, services, and relationships with caregivers). For most of these themes, convergence was observed in participants' perceptions of the needs and in the systems' responses. The data shows that persons with TBIs and their loved ones need information throughout the continuum of care, although this need changes from one phase to the next in the continuum. In the acute care phase, loved ones are preoccupied by the individual's survival, changes in their health status and potential sequelae. Their psychological state is such that any information they receive may not be retained, and later they may well think that they never received it at all. During the rehabilitation phase, despite the joy associated with the person having survived, persons with TBIs and their loved ones always seek information on changes in their situation and potential sequelae, as well as available services and indemnification and allowance procedures. In the post-rehabilitation phase, they are mainly interested in knowing more about the services and resources available in the community for social and professional reintegration, since they still do not have a clear idea of what to expect. The results have revealed a need for services over the very long term, both for TBI persons and their loved ones. Even many years after the TBI, respondents were still searching for resources and services that would meet their needs, such as respite services, support for the

TBI person, and psychological services. The main areas of divergence between France and Québec were associated with the structures of their respective service continuums. The divergences are tied to how the service continuums are structured. It would appear that the links between different network facilities in the care path of the TBI person create more problems in France than they do in Québec. The most significant difference between the French and Québec networks concerns the services that are available for fostering the person's social integration. In France, living in an outlying region is a significant barrier to service access, since many regions do not have accessible transit services, and the cities where TBI persons could have access to services and activities are far away. In contrast, in the more rural regions of Quebec, caregivers working for rehabilitation centres travel to see their clients and points of service are provided in the regions. In some regions of France, access to non-network social activities is encouraged through developments in the organization of services. Many types of resources have been developed in the network. However, comments made by Quebec participants suggest that a lack of professional resources limits the accessibility of these services. **Conclusion.** The study has revealed that each intervention must be personalized and that the support networks must be better organized and better funded if we as a society want these persons to be full citizens. A more consistent integration of TBI persons into their communities will be possible through a fair assessment of the needs of TBI persons and their loved ones, a consistent legislative framework that recognizes these needs, and the presence of resources who are available and accessible very early in the care process to work towards the persons' goals.

Reference

Lefebvre, H., Mazaux, J-M., Sarraf, T, Weiss, J-J., Azouvi, P. En collaboration avec Cohadon, A., Pourret, I., Penet, M-P. (2009). Les besoins des proches, des intervenants et des personnes ayant un traumatisme crânio-cérébral : Comparaison du Québec et de la France. (Rapport de recherche non publié : CRSH : 410-2005-2110; MSSS, REPAR, SAAQ 2005-2007; INSERM/IRSC 2007). Montréal, Québec. Université de Montréal.

Application of kinesio taping on the patients with leg paresis and recurvatum after acute ischemic stroke

L. Nikčević¹, A. Plavšić², N. Mujović³, M. Hrklović⁴, Z. Brdareski⁵, L. Konstantinović⁶, J. Vasić⁷

¹Special Hospital for cerebrovascular diseases pf brain "St Sava", Nemanjina 2, Beograd, Srbija

²Tor Vergata University of Rome

³Clinical Centre of Serbia, Belgrade

⁴Institute for Rehabilitation Belgrade

⁵Military Medical Academy, Belgrade

⁶Clinic for Rehabilitation "Dr Miroslav Zotović", Belgrade

⁷Institute for Medical Care of the workers of "Railway Serbia", Belgrade

Kinesio taping is used for improvement of the function of muscular-skeleton weakness of different aetiology and it finds its place in rehabilitation as a part of kinesio programme-Reduction of pain, improvement of the muscle power and enzyme activity, improvement of static and stability during standing and walking, accelerates early rehabilitation treatment and the return of a patient to everyday activities of life and work. The aim of the paper: Determination of the importance of application of kinesio taping of the patients with leg paresis and recurvatum of the knee after acute ischemic stroke during early rehabilitation. **Materials and methods.** The prospective study included 200 male patients treated at the St Sava Hospital in the period 01/06/09-01/08/09. The average age of patients was 62± 7. The study included patients who have weakness of the leg-paresis for the first time and smaller degree of the arm. Patients were divided into two groups. GROUP A included patients treated by classical rehabilitation kinesio programme and the GROUP B patients with Kinesio taping within the rehabilitation programme. The rehabilitation with the kinesio taping started on the first day of rehabilitation, according to the individual plan (100 patients on m. Quadriceps Femoris, 24 m Rectus Abdominis, 32 m Biceps Femoris, 68 m Quadratus Lumborum) and the tapes were changed every 3-4 days all 60 days. Kinesio programme in both groups was performed 5 days a week, 30-40 min during early rehabilitation and twice 30-40 min a day in secondary rehabilitation. Estimation of the seriousness of the neurological deficit was done by the FIM test at the beginning and in the end of early rehabilitation and after 60 days. Separately, the parameters WALKING and the ability to climb the stairs were observed. Berg's functional scale of balance was done at the beginning and in the end of early rehabilitation, as well

as after 60 days. The statistical methods included: frequencies, percentage, average values, meidana, standard deviation, scope, Fisher exact test, Wilcoxon rank sum test with continuity correction and Asymptotic Wilcoxon rank sum test and Bonferroni correlation. **Results.** In the whole group of patients the values of the parameters FIM Total, WALKING, STAIRS and the Berg's scale measured in the moments 0,14,60 are statistically significantly increased (Friedman rank sum test; $\chi^2=398,01$; $p < 2.2 \cdot 10^{-16}$). At the beginning of testing, there is no statistically important difference in values FIM Total and FIM WALKING between groups A and B. Value parameters STAIRS 0 and Berg's scale 0 are statistically significantly lower in Group A in comparison to Group B. After 14 days, the values of the parameters FIM Total and WALKING are statistically significantly higher in Group B in comparison to Group A. The Trend is remaining the same after 60 days. Values of the parameter Stairs 14 and 60 and Berg's scale 14 and 60 are significantly lower in Group A in comparison to Group B. **Conclusion.** Our results undoubtedly confirm the place of Kinesio Taping in early rehabilitation after acute ischemic insult of the patients with the leg paresis in faster maintenance of balance and walking. Kinesio Taping is applied according to the protocol of the International association leads to faster functional recovery, stability in walking and climbing the stairs of he patients with recurvatum of the knee after acute ischemic stroke.

Reference

1. A.Hostman et al.Muscle function of knee extensors and flexors after stroke is selectively impaired at shorter muscle lengths.J Rehabil.Med 2009;41:317-321
2. Ada L,Canning CG,Low SL.Stroke patients have selective muscle weakness in shortened range.Brain 2003;126:724-731
3. Nosaka.K.(1999).The effect of Kinesio Taping on Muscular Micro-Damage Following Eccentric Exercises.15th Annual Kinesio Taping International Symposium Review.(pp.70-73) Tokyo,Japan:Kinesio taping Association.
4. Munawa Wanijuru.How a Kinesio Tape Will
5. H.M.Murray (2000).Effects of Kinesio Taping on Muscle Strength after ACL- Repair.Journal of Orthopedic and Sports Physical Therapy,30,1.
6. K.Kase.1994.Illustrated Kinesio Taping,3rd,Ed.,Ken 'l Kai,Tokyo,pp 90-91

Quality of life after total hip replacement

M. Spalevic, L. Dimitrijevic, M. Kocic, I. Stankovic, B. Cvetkovic, M. Mandic

Clinic of Physical Medicine and Rehabilitation, Nis, Serbia

Introduction. Nowadays patients have a total hip replacement surgery in order to get rid of pain and restore functional activities and former quality of life. **Aim.** To estimate quality of life after total hip replacement (THR) using clinical examination, as well as self-report health-related quality of life questionnaires- The WOMAC and SF-36. **Materials and methods.** Prospective clinical study included 21 patients 36-74 years old (average age 65,87) assigned for THA due to coxarthrosis. All patients were included in standard postoperative rehabilitation program consisted of kinesy and occupational therapy, low frequency pulsed magnetic field and interferent electrotherapy for 4 weeks. Self-report health-related quality of life questionnaires-The WOMAC (Western Ontario and McMaster Universities Index of Osteoarthritis) and SF-36 (The Medical Outcomes Study 36-Item Short-Form Health Survey) were used for evaluation before and 6 months after the surgery. Range of motion (ROM) and muscle strength were also measured. **Results.** All patients achieved significant improvements in their scores for every category of WOMAC and SF-36 (pain, stiffness, physical function and vitality, active participation in daily living activities, social function and general health). Before operation WOMAC score had a median value of 76(47-93), while the mean score was 75,24±12,75. 6 months after the surgery median value became 26(7-70), and the main score 29,71±15,39; ($p=0,000001$). SF-36 score had a median value of 4(1-10) and the mean score 4,38±3,06 preoperatively. 6 months later median value reached 18(6-25), and the mean score of 17,81±5,95; ($p=0,000001$). ROM and muscle strength were much improved 6 months following surgery, too. More than 90% of patients reported complete or almost complete pain relief regardless of their preoperative categorization of pain. **Conclusion.** All patients after THR reached large improvement due to pain, function and muscle strength. 90,48% of patients claimed to be satisfied with their postoperative results and regained quality of life. Combined with clinical parameters, WOMAC and SF-36 Questionnaires provide reliable results for monitoring functional status and quality of life after THR.

References

1. Quintana JM, Escobar A, Arostegui I, Bilbao A, Azkarate J, Geonaga JI, et al. Health-related quality of life and appropriateness of knee or hip joint replacement. Arch Intern Med. 2006 Jan 23; 166(2):220-6.

- Trudelle-Jackson E, Smith SS. Effects of a late-phase exercise program after total hip arthroplasty: a randomized controlled trial. *Arch Phys Med Rehabil*. 2004 Jul; 85(7):1056-62.
- Röder C, Staub LP, Eggli S, Dietrich D, Busato A, Müller U. Influence of preoperative functional status on outcome after total hip arthroplasty. *J Bone Joint Surg Am*. 2007 Jan; 89(1):11-7.

Rehabilitation program after total hip and knee replacement

M. Spalevic, L. Dimitrijevic, M. Kocic, I. Stankovic, B. Cvetkovic, M. Mandic

Clinic of Physical Medicine and Rehabilitation, Nis, Serbia

Introduction. All patients after total hip and knee replacement surgery need to be included in the physical therapy and rehabilitation program, especially during the early postoperative period. **AIM:** To estimate efficiency of the well organized, comprehensive physical therapy and rehabilitation program following total hip (THR) and total knee replacement (TKR). **Materials and methods.** Prospective clinical study included 36 patients 36-74 years old (average age 62,3±7,8(s.d.)) assigned for THR and TKR due to the clinical and radiological features of advanced hip or knee osteoarthritis. Rehabilitation started at the postoperative day one. While staying at the Orthopedic Clinic (7 to 10 days averagely), kinesy and magneto therapy procedures were applied and patients were trained for assistant dosed walk with crutches, with the toe touch or full weight-bearing on the operated leg, depending on the endoprosthesis type (cemented, non-cemented or hybrid). On 10-14 day after operation patients were directed to the Clinic of Physical Medicine and Rehabilitation, where they received postoperative treatment consisted of kinesy and occupational therapy, low frequency pulsed electromagnetic field (20 mT, 50 Hz) and interferential currents(0-100 Hz), for 3 weeks. The workout program included individual and group therapeutic exercises twice a day: breathing exercise, active rhythmic therapeutic exercise, active and active-assistive exercise to increase hip and knee range of motion (ROM) with the usage of passive continuous motion for TKR patients, static contractions of quadriceps and gluteal muscles, strengthening exercise for other leg and upper extremities. Dosed walk with crutches with increasing the distance and walk up and down the stairs was also prescribed, in order to achieve functional, economic and enduring gait. During the second or third postoperative month, patients were referred to the extended rehabilitation treatment in some of the balneo climatology centers, to continue the same rehabilitation protocol, with the addition of hydro and hydro-kinesy therapy, if there were no cardiovascular contraindications. After finishing intrahospital rehabilitation, patients were advised to continue with the previously learnt exercise in their home environment, daily. The WOMAC and SF-36 quality of life questionnaires, ROM and muscle strength were used as evaluation instruments. Statistical analyses were performed using SPSS software, version 13. Values from baseline and 6 months later were compared using Wilcoxon, Mann-Whitney U and Student's T-test for dependent and independent samples. **Results.** All patients attained significant improvement for every segment of WOMAC and SF-36; (p=0,000001). ROM and muscle strength increased considerably. Questionnaires showed statistically significant differences between baseline and 6 months follow up scores for both categories of patients, while the covariance analyses showed significant differences between patients with coxarthrosis and gonarthrosis for almost every score analyzed. THR patients amended more due to pain reduction (p=0,001), physical function (p<0,001) and general health postoperatively (p<0,036). In both categories patients with the worse preoperative results ameliorated more, but failed to reach the scores of less disabled patients, with the exception of pain. **Conclusion.** Applied physical therapy and rehabilitation program proved to be highly effective for patients after THR and TKR. Both categories of patients benefited greatly and achieved large improvement due to pain reduction, muscle strength and function. The adapted comprehensive rehabilitation program needs to be conducted as soon as possible.

References

- Rooks DS, Huang J, Bierbaum BE, Bolus SA, Rubano J, Conolly CE, Alpert S, Iversen MD, Katz JN. Effect of preoperative exercise on measures of functional status in men and women undergoing total hip and knee arthroplasty. *Arthritis Rheum*. 2006 Oct 15;55(5):700-8.
- Quintana JM, Escobar A, Arostegui I, Bilbao A, Azkarate J, Geonaga JJ, et al. Health-related quality of life and appropriateness of knee or hip joint replacement. *Arch Intern Med*. 2006 Jan 23;166(2):220-6.
- Wollmerstedt N, Glatzel M, Kirschner S, Schneider J, Faller H, König A. Comparative analyses of patient-centered outcome of total hip and knee arthroplasty. *Z Orthop Ihre Grenzgeb*. 2006 Sep-Oct;144(5):464-71.

Evidence based Standards for Rehabilitative Therapy: Improvement of Process Quality Through Performance Indicators

S. Brueggemann, R. Buschmann-Steinhage

German Pension Insurance, Berlin, Germany

Introduction. The German Pension Insurance is one of the major rehabilitation carriers in Germany. In this capacity we initiated a research programme comprising several research projects that developed evidence based treatment standards focusing on the process of rehabilitation (1). Each set of treatment standards consist of various different therapeutic modules, thus formulating a standard of care that is considered necessary for a comprehensive rehabilitation. (2) The degree of adherence to the standards can be measured using performance indicators that are defined for each of the standards' modules. So far, the following indications have been addressed: coronary heart disease, chronic low back pain, diabetes mellitus type 2, alcohol dependency, breast cancer, stroke, hip/knee replacement, depression, and paediatrics. **Materials and methods.** In accordance with the methodology of evidence based medicine for each indication therapeutic modules were developed. In each module frequency and duration of treatment sessions were defined. Furthermore, it was specified, which codes from the German rehabilitative coding system KTL (classification of therapeutic measures) may be used by health service providers in order to fulfil the standards. Finally, a minimum percentage of patients requiring such treatment was defined as a quality indicator. As each treatment carried out during rehabilitation is documented in the discharge letter, the institutions carrying the rehabilitation can evaluate the quality of the rehabilitation in each module any single patient has received. The results are fed back to the health service providers thus encouraging rapid implementation and adherence. **Results.** All treatment standards feature modules regarding exercise training, health education, psychological treatment (i.e. relaxation techniques, counselling) as well as social work (i.e. aftercare, occupational re-integration). In their entirety these modules represent the bio-psycho-social model of health and disease. Even before the formal implementation of the standards treatment in some modules was consistent with the target values. In some modules, however, treatment was higher or lower than the specified target. We were able to demonstrate, that already shortly after the implementation the spectrum of treatment changed in accordance with the specifications. This trend has become even stronger in time. Reasons as to why the standards' requirements are not been met universally have been systematically evaluated. The main reason seems to be inadequate coding practice in the discharge letter followed by different demand and lack of patient motivation. Also, in some instances the requirements were unreasonably high. **Conclusion.** The scope of the German Pension Insurances' evidence based treatment standards ranges from exercise training, health education and psychological treatment to social work, thus representing the bio-psycho-social model of health and disease. Through the implementation of treatment standards that are evidence based and can be measured easily process quality of rehabilitation in Germany has increased and will increase even further. Future efforts have to be geared towards a better adherence of the standards' specifications as well as to the reduction of possible barriers.

References

- Korsukéwitz, C (2007): Vorgaben für eine gute Rehabilitation. *Deutsches Ärzteblatt*, 104(23):A 1640-2.
- Brüggemann S, Bitzer E (2009): Development of standardised comprehensive therapeutic specifications for a multimodal rehabilitation of chronic illnesses. *Int J Rehabil Res* 32 Suppl. 1: S38.

Can we predict physical and mental health?

N. Zdanowicz, B. Lepiece, D. Tordeurs, D. Jacques, C. Messaud, V. Thomas, D. Bohy, Ch. Reynaert, J. Tecco, P. Janne

Université Catholique de Louvain, Psychosomatic unit, Clinic of Mont-Godinne, Yvoir

Introduction. To identify social, familial, personality and health locus of control factors that may influence physical and mental health, as well as drugs use and the number of medical consultations. **Materials and methods.** 20 subjects (10 adolescents and 10 adults) without any psychiatric disorder are included in a 2-year prospective study. At baseline, age, sex, family structure, disposable income, chronic treatments, family dynamics (Family Adaptation and Cohesion Scale), multidimensional health locus of control and personality (revised NEO Personality Inventory) are taken into account. Every 6-month

period, their mental and physical health status (12 Survey Factors and Hamilton Depression Scale), their drugs use and the number of medical consultations are reconsidered. **Results.** At baseline and at 6 months, physical health level is proved to be the more predictive parameter. At baseline, a linear regression model with 4 factors, including a cohesion between the native family and the current couple, an open-minded personality and the adaptability of the ideal family, explains 82.4% of the variance. At 6 months, 30.3 % of the variance is explained by the cohesion of the nuclear family and neurosis. **Conclusion.** Contrarily to what we should have expected, the physical health level is proved to be a more predictive parameter than mental health level. The parameters determining it change with time. The future results must confirm these primary observations.

References

1. Zdanowicz N, Reynaert C. Adolescent health. *Lancet*. 2004 Aug 7-13;364(9433):497.
2. Zdanowicz N, Janne P, Reynaert C. Family, health, and adolescence. *Psychosomatics*. 2004 Nov-Dec;45(6):500-7.
3. Zdanowicz N. Adolescent today in medicine. New-York: Nova Publishers; 2008.
4. Zdanowicz N. DJ, Reynaert Ch.. Can we predict the health of teenagers 2 years in advance ? A preliminary study. *European Journal of Psychiatry*. 2006;1:5-12.
5. Olson DH. Circumplex model VII : validation studies and FACES III. *Family Process* 1986;25:337-51.
6. Wallston K.A. WBS, De Vellis R. Development of the multidimensional health locus of control scale. *Health Education Monography*. 1978;6:160-70.
7. Zdanowicz N. RC, Denis J. Determining factors in Health during adolescence: a cross-sectional and longitudinal study. New-York: Nova Publishers; 2006.
8. Lecrubier YWE, Hergueta T, Amarin P, Bonora LI, Lépine JP. M.I.N.I. Mini International Neuropsychiatric Interview French Version 5.0.0. Paris: Inserm; 1998.
9. Costa P. MR. Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory NEO-FFI. Odessa: Psychological Assessment Resources; 1992.
10. Ware JE. KM, Keller SD. A 12-item short form healyt survey: construction of scales and preliminary tests of reliabilty and validity. *Medical Care*. 1996;34:220-33.
11. Hamilton M. Development of a rating scale for primary depressive illness. *Britsch journal of social and clinical psychology*. 1967;6:278-96.
12. Alonso J, Ferrer M, Romera B, Vilagut G, Angermeyer M, Bernert S, et al. The European Study of the Epidemiology of Mental Disorders (ESEMeD/MHEDEA 2000) project: rationale and methods. *Int J Methods Psychiatr Res*. 2002;11(2):55-67.

Efficacy of substitutive treatment in 18 patients with traumatic brain injury and GH deficit

O. Kozłowski, C. Cortet-Rudelli, W. Daveluy, P. Fontaine, M. Rousseaux

Introduction. Patients with severe traumatic brain injury (TBI) frequently show cognitive sequelae, fatigue and impaired quality of life (QoL). Several recent studies have shown that pituitary deficits are frequent, including growth hormone deficit (GHD). GHD patients without TBI also have fatigue, impaired QoL and cognitive disorders, which can be improved by substitutive treatment. Here, we analyzed the effectiveness of substitutive treatment in TBI patients. **Materials and methods.** TBI patients who complained after one year of fatigue and cognitive disorders had systematic assessment of pituitary functions (with stimulation tests), physical and cognitive (attention, memory, executive functions) disorders and QoL (QOLIBRI scale). All hormonal deficits were supplemented, including GHD. Control of cognitive assessment and QoL was performed one year later. Results obtained in a group of 18 GHD patients were compared with those of an equivalent group (age, education level and TBI severity) of non-GHD patients. In the treated group, all parameters of QoL evolve favourably. More definite improvement was found in GHD patients for the QOLIBRI scale subtests. We note a significant improvement in QoL on intellectual axis assessed by the patient (p=0,004) but also by the family (p=0,047) and personal axis assessed by the family(p=0,02). In the treated group, the weight and BMI decreased significantly (p=0.028 and 0.04) and the improvement in several parameters of QoL were significantly correlated with lower weight and BMI. Only 2/18 patients wished to discontinue treatment after one year. **Conclusion.** In TBI GHD patients, substitutive treatment can contribute to better improvement in QoL and to lose weight but it's more heterogeneous for cognitive parameters. These results must be confirmed in a larger group of patients. **Results.** In the treated group, neuropsychological changes is more favourable for the parameters

of memory but more heterogeneous for attention. In the treated group, all parameters of QoL evolve favourably. More definite improvement was found in GHD patients for the QOLIBRI scale subtests. We note a significant improvement in QoL on intellectual axis assessed by the patient (p=0,004) but also by the family (p=0,047) and personal axis assessed by the family(p=0,02). In the treated group, the weight and BMI decreased significantly (p=0,028 and 0,04) and the improvement in several parameters of QoL were significantly correlated with lower weight and BMI. Only 2/18 patients wished to discontinue treatment after one year. **Conclusion.** In TBI GHD patients, substitutive treatment can contribute to better improvement in QoL and to lose weight but it's more heterogeneous for cognitive parameters. These results must be confirmed in a larger group of patients.

References

León-Carrión J, Leal-Cerro A, Cabezas FM, Atutxa AM, Gomez SG, Cordero JM, Moreno AS, Ferrari MD, Domínguez-Morales MR. Cognitive deterioration due to GH deficiency in patients with traumatic brain injury: a preliminary report. *Brain Inj*. 2007 Jul;21(8):871-5.

Kelly DF, McArthur DL, Levin H, Swimmer S, Dusick JR, Cohan P, Wang C, Swerdloff R. Neurobehavioral and quality of life changes associated with growth hormone insufficiency after complicated mild, moderate, or severe traumatic brain injury. *J Neurotrauma*. 2006 Jun;23(6):928-42

Kreitschmann-Andermahr I, Poll EM, Reineke A, Gilsbach JM, Brabant G, Buchfelder M, Fassbender W, Faust M, Kann PH, Wallaschofski H. Growth hormone deficient patients after traumatic brain injury—baseline characteristics and benefits after growth hormone replacement—an analysis of the German KIMS database. *Growth Horm IGF Res*. 2008 Dec;18(6):472-8. Epub 2008 Oct 1.

????

????

?????

Introduction. While rehabilitation therapists use various types of hand orthoses to prevent secondary impairments of pain, edema and loss of ROM in people post stroke, the effectiveness of these orthoses remains controversial (Aoyagi & Tsubahara, 2004; Ma & Trombly, 2002; Steultjens, Dekker, Bouter, Leemrijse, & van den Ende, 2005; Steultjens et al., 2003). **Aim.** The purpose of this study was to evaluate the preventive effect of a neutral functional realignment hand and wrist orthosis on pain, ROM, and edema in people post stroke during the subacute rehabilitation recovery phase. **Materials and methods.** The study design was a randomized controlled trial of 30 post-stroke patients with severe deficits of the upper limb during the subacute recovery phase in an inpatient rehabilitation center. The control group (n=15) participated in a standard rehabilitation program with no hand orthosis and the experimental group (n=15) received a neutral functional realignment orthosis in addition to the standard rehabilitation program. The experimental group wore the neutral functional realignment orthosis for at least 6 hours daily. Main Outcome Measures: Hand pain at rest (visual analog scale), wrist range of motion (Fugl-Meyer assessment subscale), and edema of hand and wrist (circumferences). Outcome measures were assessed at baseline and after 13 weeks. **Results.** At baseline, 2 patients in each group complained about a painful hand. After 13 weeks, 8 subjects in the control group and 1 subject in the orthosis group complained of hand pain (P<.004). Mobility and edema evolved similarly in both groups. **Conclusion.** Neutral functional realignment orthoses have a preventive effect on poststroke hand pain, but not on mobility and edema in the subacute phase of recovery. This research has been published: Bürge, E., Kupper, D., Finckh, A., Ryerson, S., Schneider, A. & Leemann, B.(2008).Neutral Functional Realignment Orthosis Prevents Hand Pain in Patients With Subacute Stroke: A Randomized Trial, *Archives of Physical Medicine and Rehabilitation*, 89, 1857-1862.

References

Aoyagi, Y., & Tsubahara, A. (2004). Therapeutic orthosis and electrical stimulation for upper extremity hemiplegia after stroke: A Review of Effectiveness Based on Evidence. *Top Stroke Rehabil* 11(3), 9-15.

Grossman, M., Sahrman, S., & Rose, S. (1982). Review of length-associated changes in muscle. *Phys Ther* 62(12), 671-673.

Langlois, S., Pederson, L., & Mackinnon, J. (1991). The effects of splinting on the spastic hemiplegic hand: report of a feasibility study, 58, 17-25.

Ma, H., & Trombly, C. (2002). A synthesis of the effects of occupational therapy for persons with stroke, Part II: remediation of impairments. *Am J Occup Ther* 56, 260-274.

Neuhaus, B., Ascher, V., Coullon, B., Donohue, M., Einbond, A., Glover, J., et al. (1981). A survey of rationales for and against hand splinting in hemiplegia. *Am J Occup Ther* 35(2), 83-89.

Ryerson, S. (2007). *Hemiplegia* (2nd ed.). St. Louis: Mosby.

- Steltjens, E., Dekker, J., Bouter, L., Leemrijse, C., & van den Ende, C. (2005). Evidence of the efficacy of occupational therapy in different conditions. *Clin Rehabil*, 19(3), 247-254.
- Steltjens, E., Dekker, J., Bouter, L., van de Nes, J., Cup, E., & van den Ende, C. (2003). Occupational Therapy for Stroke Patients: A systematic Review. *Stroke* 34(3), 676-687.

The modern technologies of restorative medicine and rehabilitation of patients with acute infringements of cerebral blood circulation

N. Sichinava, E. Ivanova, T. Ibragimov

The Russian Scientific Centre for Restorative and Resort Medicine, Moscow, Russia

The problem of vascular diseases of a brain remains now is one of the major in neurology. Annually in the world the acute infringements of cerebral blood circulation develop at 15 million persons. Death rate after for the first time in a life of the developed stroke makes 12% within the first 7 days, 19% within the first 30 days, 31% within a year. About 80% survived after cerebrovascular "accident" become invalids. Working out and introduction of new highly effective technologies of restorative treatment and rehabilitation of patients with cerebral vascular diseases, based on modern researches and achievements is extremely important. For today becomes obvious to effective planning and realization programs of restoration of patients with acute infringement of the cerebral blood circulation the multidisciplinary approach, the joint, coordinated efforts of various experts (the neurologist, the doctor of restorative medicine, the physiatrist, the logopedist, the psychologist, the masseur, etc.), and also active participation of the patient and his relatives. Now the active position concerning strategy and tactics of rehabilitation of patients with the stroke prevails: the early beginning of rehabilitation actions; stages of rehabilitation; Individualization of rehabilitation programs. In restorative treatment of patients with acute infringement of cerebral blood circulation the complex approach with use of various medicamentous and not medicamentous methods. At the heart of restoration and indemnification of the broken functions at brain damage mechanisms neuro plasticity, therefore a paramount problem of rehabilitation is studying of possibility of adequate management by this process by means of restorative medicine. The most frequent consequences of the stroke are impellent frustration in the form of paralysis and paresis. The basic method of impellent frustrations' correction is kinezotherapy – the special individually picked up techniques of medical gymnastics, is active-passive technicians of reflex exercises on systems Vojta, Kastilo-Moralema, PNF, various kinds of massage and robotized mechanical therapy (walking restoration), training apparatus of a various orientation (cyclic, power, inertial, rotational, etc.) with the built in monitoring system of symmetry control, with biologically-feedback. Essentially new direction of motor rehabilitation is the method of external reconstruction of walking with application of the robotized complexes possessing ample opportunities of modeling of the patient's degree of impellent participation in real time. Uniqueness of a technique consists that training process of restoration of walking, begins even in horizontal position and the loading increase occurs with simultaneous transition in vertical position of the patient. Same promotes selective vibrostimulation - multidot stimulating influence on basic zones of feet in a mode of normal walking at absence or restriction of impellent function (modeling of a touch image of walking) which is effectively used since the acute period of a stroke. The similar computerized complexes are used for functional therapy of the top finiteness with the expanded feedback which promotes not only to inclusion of operating levels of the control of sensor-motor behavior, but also intelligent involving of patient in restoration process. For improvement of stability and reduction of asymmetry of a vertical pose various technologies are used: special medical-gymnastic exercises, step-trainings, trainings by means of mobile platforms with application of biomanagement method. It's proved, that an obligatory component of effective complex restorative treatment and rehabilitation of patients with acute infringements of cerebral blood circulation are means physio-balneotherapy. One of perspective directions in this plan is through the cerebral electro-magneto therapies application: an electro dream; the sinusoidal modulated currents; interferential currents; low-frequency variable magnetic fields. At the heart of medical action through cerebral techniques lays activation of fabric breath, increase of rates of processes of reorganization and restoration in the central nervous system, i.e. activation of mechanisms of plasticity. The stimulating physiotherapy techniques: high-intensity magnetic stimulation; multichannel pro-

grammed electrostimulation with biologically feedback. Creation of such devices has allowed applying magnetic stimulation to more effective research of memory, the central sight, and movements. Many Russian and foreign researchers prove efficiency of inclusion in programs of rehabilitation and restorative treatment of patients with acute infringement of the cerebral blood circulation of balneotherapy methods: the chamber mineral baths (2-4 chambers); the dry air carbonic baths Application ergotherapy in programs of restorative treatment and rehabilitation of patients with acute infringement of the cerebral blood circulation essentially increases efficiency of restoration of daily activity. There are methods of motoring-functional ergonomic trainings at imitating stands-training apparatus were extended patients. Use of modern innovative technologies, realization of individual stage-by-stage programs of restorative treatment and rehabilitation of patients with acute infringement of the cerebral blood circulation on a basis of much disciplinary approach allows to achieve as much as possible full and steady restoration of the broken functions, to raise quality of a life and social activity, to lower indicators of time disability and physical inability.

The modern technologies of restorative medicine in the complex correction of the functional reserves of the organism at the persons with risk of the arterial hypertension development

I. Ekaterina

The Russian Scientific Centre for Restorative and Resort Medicine, Moscow, Russia

Introduction. Actual studying of indicators of functional reserves and adaptable possibilities of an organism at the persons inclined to development of a proof arterial hypertension, working out of complex programs the adapted influence constructed on principles of complementarily, strengthening of effects of their components, in our opinion, is. **Materials and methods.** We survey 150 men at the age from 20 till 45 years. Complex of restorative correction: BIOLONG-pearl baths; psychological and relax therapy; physical trainings; an individual diet. BIOLONG is the foam washing composition containing in quality of the basic operating beginning a preparation mitofen – water-soluble polymeric structurally functional analogue natural coenzyme Q10. Unlike analogue the preparation is an effective water-soluble antioxidant. The preparation promotes increase of power supply of live cages at the expense of more favorable use of oxygen in a respiratory chain, and also will neutralize oxidizers which are formed at sharp oxygen insufficiency in organism fabrics. **Results.** There were normalization of variability the arterial pressure is noted, especially during evening and night time (in 84% of cases), absence of incidental increase the arterial pressure during the evening and night time observed before treatment, is revealed decrease in the general vascular peripheral resistance at carrying out of loading test (62%), improvement microcirculation blood-groove (90%), normalization daily excretion catecholamine (30%), harmonization of functional activity cardio respiratory systems at physical activity (86%), reduction of degree of meteo sensitivity (54%), and also mood improvement, decrease in uneasiness and activity increase (94%). **Conclusion.** The given technology can be recommended for inclusion in programs of medical rehabilitation, restorative and improving establishments, SPA and WELLNESS centers.

References

- Razumov A., Pokrovskiy V. - Health of the healthy person. Scientific bases of restorative medicine. - The monographs, - Moscow, - 2007.

Clinical observation on effect of Clearing the Governor Vessel and Refreshing the Mind Needling on Head SPECI and CT Scanning of children with Cerebral Palsy

Zhenhuan Liu Nanhai

Maternity & Children's Hospital of Guangzhou University of Traditional Chinese Medicine P.R, China

Objective. To investigate action and value of acupuncture in Cerebral Palsy rehabilitation. **Materials and methods.** 100 spasm Cerebral Palsy patients from 2 to 7 years old were randomly divided into two groups. Acupuncture group: 50 patients were treated with head acupuncture and body acupuncture; Rehabilitation-training group: 50 patients were treated with physical therapy of Bobath and Vojta methods. **Results.** The total effective rate acupuncture and rehabilitation-training group were obvious higher than that of reha-

bilitation-training group. After treatment the DQ value of rehabilitation-training + acupuncture group were higher than that of rehabilitation group ($p < 0.01$). In acupuncture and rehabilitation-training group were higher than that of rehabilitation group ($p < 0.01$). In acupuncture and rehabilitation-training group, improvement rate of brain dysphasia, brain atrophy in skull CT and recovery normal rate of skull SPECT were obvious higher than that of rehabilitation-training group ($t=4.731$ $t=5.971$ $p < 0.01$). **Conclusion.** Acupuncture can obviously increase cerebral blood flow (CBF) and improve cerebral cell metabolism, promote partial or complete compensation of cerebral function and the restoration and function of plasticity of cerebral tissue in children with cerebral palsy.

The Clinical Study of the Curative Effect of Childhood Autism Treated by Head Acupuncture

Zhenhuan Liu Nanhai

Maternity & Children's Hospital of Guangzhou University of Traditional Chinese Medicine P,R, China

Objective. In order to investigate the clinic effect of head acupuncture therapy on childhood autism. **Materials and methods.** We have observed the chincial curative effect of 38 cases of childhood autism treated by head acupuncture.(31 male cases;7 female cases;3-11 of the age) We named this cure "9-acupoint Cure ",which head acupuncture of Nine needles of intelligence five needles of forehead and Seushenchung acupoints. It takes 30 times, needling every other day, in each course of the treatment. After 2 year's followed up visiting and observing. **Results.** We find that the scosr of the Cars measurement is obviously discrepancy after and before the treatment , $P < 0.0$ and the electroencephalogram of most of the children is improved after the treatment. With 3 months' treatment, 16 cases have obvious effect (42.1%) 14 cases show the effect (36.8%) and only 8cases show no effect (21.1%). After 2 years' followed-up visiting, we find that 14 children have gradually got recovered. **Conclusion.** The result shows that the head acupuncture therapy can obviously improve the solitary behaviour , communicative obstruction , logopathy of the childhood autism ,the obstruction of visus communication and the emotion indifference.

Treatment of Cerebral Palsy with Speech Disorder By Linguistic Training and Acupuncture

Zhenhuan Liu Nanhai

Maternity & Children's Hospital of Guangzhou University of Traditional Chinese Medicine P,R, China

Objective. To study the best way to treat the children with cerebral palsy and speech disorder. **Materials and methods.** 76 children with cerebral palsy and speech disorder were studied by randomized controlled trial since 2000. 38 children in treatment group was treated by speech therapy combined with sharpening mind and inducing consciousness acupuncture. The control group were treated only by speech therapy and one treatment course is 3 months. Sharpening mind and inducing consciousness acupuncture was used every other day and one treatment course is 30 times.**Results.** The clinical good improvement rate shows: the treatment group(27/38) 71%, control group(13/38)34.44%, $X^2=10.34$ $P < 0.01$. The speech DQ after treatment shows: treatment group 56.36% \pm 19.77, control group 46.96% \pm 15.63 $t=2.524$ $P < 0.05$. **Conclusion.** The method of combination of the traditional Chinese medicine and the west medicine is significantly better than that of simple speech therapy in the rehabilitation treatment of cerebral palsy with speech disorder.

Annotation

????

????

To the beginning of the third millennium many traditional resources of human progress have started to lose the paramount value. This tendency has extended on biology and medicine. Creation of complete model of a human body and disturbances descending in it became the major scientific problem in modern medicine. Scientists this complexity admits an assessment of a homeostasis which is realized by the agreed work of million billions (10^{15}) informational-con-

trolling frames entering into it of cells of organs and systems [1]. The modern clinical medicine in the approach to removal of disturbances in an organism puts a problem on formation of the diagnosis on the basis of the taped deflections in a homeostasis, i.e. from items of the built model of sickness. Sicknesses seeming by equal developing process can have a different exit for homeostasis area. Therefore sampling of therapeutic provisions not always can be adequate for restoration of disturbances in a homeostasis and unconditionally faultless. Furthermore equal communication between the diagnosis and sampling of medical procedure does not exist. Because of infinite complexity of the human body, the restricted possibilities of studying results of interacting with it of medical products with that completeness which would secure absence of undesirable side effects, have defined the dual attitude to medicines. And, moreover, application of medical products, even "specific" act, did not promote the solution of a problem of a homeostasis as the human body has answered with rough reaction of "disagreement". The problem urgency is burdened by growth of risk factors: pressure ecological, psycho-emotional, adaptive, etc. which not only have raised a case rate, but also have varied frame and character of a pathology (the big polymorphism, severity of clinical and pathomorphologic changes in an organism), that as a whole has led to growth of a chronic pathology. This condition induced scientists to search of paths of the permission of the developed contradictions in a medical science and practice. And some decades (60-80 of the XX-th century) not casual are devoted researches of the problems anyhow bound to studying of factors, damaging health. The space medicine [2] has given a jerk to development of many prenosologic researches in preventive medicine and promoted progress in range of preclinical diagnostics (V.V. Kaznacheev, R.M.Baevsky, A.P.Baevsky, 1981). On the foreground there is information [3] as the absolute true of knowledge of the phenomena and nature processes, becomes a leading resource of scientific and technical progress, possessing with which it is possible to equip a way of life of the person cardinally. There was a possibility optimum to observe and decide all spectrums of problems of physics, astronomy, chemistry, biology, medicine, sociology, engineering, business, a policy, space. To the present time [4] accurate definition of the information is made. It's fundamental generalized single, out of initial, infinite process of the resonance-cellular, frequency-quantum and wave attitude, interacting, a transmutation (in space and a time) energies, traffics, masses and anti-masses on a base of materialization and dematerialization in micro-and Universe macrostructures. All the mystery of nature is covered in **relations**, all starts with relationships (correlation). Relationships in micro-and macrostructures, - invisible to an eye of the person can be studied on a base of informatiological methods and by information diagram with high-strung informatiometric devices. Scientists undertake much force in search of a first cause of sicknesses on **ΜορφοφυκμηροαπβηοΜ**, biochemical, metabolic and even on psycho emotional levels of functioning of an organism. The most complicated chemical-medical-technical industry with high specialization of the doctor, attending to removal of the secondary causes of sicknesses is as a result framed. Our researches are devoted by primitive cause search, i.e. the informational components by means of which the relations are installed and carry out communication of members and systems among themselves and a circumambient, i.e. to studying of problems of the informational medicine. The greatest interest [1] in clinic is represented by aspects of act of electromagnetic fields (EMF), bound not with power of affecting and an absorbed energy, and with alarm characteristics, but with that information coded in the conforming fields and radiances and is significant for interacting with biological system. We searched and have found the important direction which have based radio physical and clinic-experimental researches namely in this hypothesis. Research works are finished by building of items of medical production engineering: **1. Analyzer-indicator** of millimetric signals "AIS-LIDO" as a diagnostic device is serially produced by small parties by Joint-Stock Company NCIM "LIDO" starting from 1999. It is main base of treatment-diagnostic complex "Center of information medicine" (briefly LDK CIM "TUNING-FORK OF HEALTH[®]"). The organizational-allowing documentation: TU 9442-001-17912343-99 with changes dated 25.12.2006; Certificate of accordance N. ROSS RU.0001.11NM25 dated 25.01.2007; The registration certificate N. 29/23041099/1679-01 dated 28.02.2001; License to of Federal service on supervision in the field of health protection and social development realization of activity on the production of medical technique N. 99-03-000192 dated 22.02.2005; Patent on an invention N. 2156106 dated 07.12.1999. Implementation of methodical and clinical workings out of practical application of "AIS-LIDO" has given the chance to formulate terminological aspects of a new direction and have inflated with the concrete contents the informational medicine.



Figure 1. – Device for diagnostics “AIS-LIDO”.



Figure 2. – Apparatus for treatment “MINITAG”®.

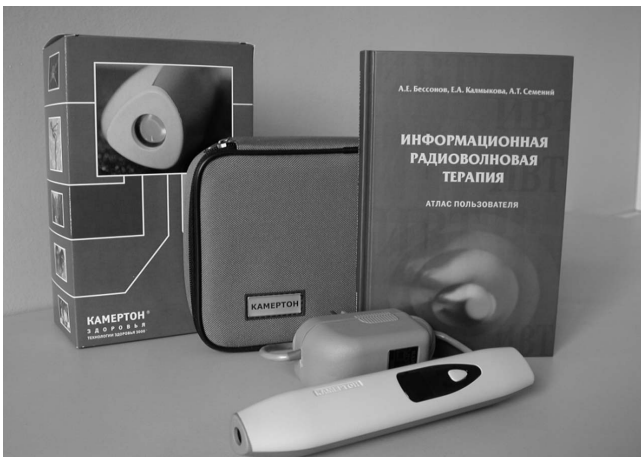


Figure 3. – Apparatus for treatment CAMERTONE.



Figure 4. – Apparatus for treatment CAMERTONE.

For the task solution of renewal of informative homeostasis we have made Scientific Research Job “Development of MTT and OKR of vehicle for informatively-wave therapy of MINITAG®, 1994-1998. 2. Apparatus MINITAG® for informational-wave therapy serially produced starting from 1998. The organizational-allowing documentation: TU 9444-001-17912343-98; Certificate of accordance N. ROSS RU. NM02.B11826 dated 15.07.2004; The registration certificate N. 29/23020498/1678-04 dated 05.01.2004. License to of Federal service on supervision in the field of health protection and social development realization of activity on the production of medical technique N. 99-03-000192 dated 22.02.2005. Patent on an invention N. 2127616 dated 03.02.1998. The oscillator of noise electromagnetic modes frames radiance in the wide frequency band, recoating all possible, so-called, therapeutic frequencies used in GSF - systems of medical appointment. Electromagnetic modes besides, radiated by the system have been modulated on voltage by therapeutically significant (informational) signals of ultralow frequencies. 3. Subsequent researches on development of the apparatus for the treatment have resulted to the apparatus “TUNING FORK” (CAMERTONE) for the informational radio wave therapy. It is produced in lots since 2007. The organizational-allowing documentation: TU 9444-002-17912343-2006. Certificate of accordance N. ROSS RU. NM25.B00350 dated 28.04.2007. The registration certificate N. FS 022a2006/2921-06 dated 06.02.2006. License to of Federal service on supervision in the field of health protection and social development realization of activity on the production of medical technique N. 99-03-000192 dated 22.02.2005. Patent on an invention N. 2127616 dated 03.02.1998. Principle of medical health effect of apparatuses CAMERTONE and MINITAG® is the same. The medical equipments are sold with preliminary preparation of specialists (doctors and paramedical personnel) under the program in 72 hours. About 700 users of production engineering it is prepared for the present time. **Conclusion.** 1. Researches (A.E. Bessonov, E.A. Kalmykova) by means of the analy-

zer of spectra "AIS-LIDO" have registered an electromagnetic radiation of the vegetative centers, organs and systems over the range the highest frequencies (mm-wave band), containing the informational component (information). Thereby it is confirmed, that in cellular protoplasm there are biochemical and biophysical processes to formation of free energy and electromagnetic radiation generation in mm-wave band which represent normal flow of life, supplying the informational homeostasis. The basis of a substantiation of the mechanism of maintenance of the informational homeostasis, both separate cages, and their sets are assumed. 2. The method of the informational radio wave diagnostic (RWD) and therapies (RWT) is realized on a base of informatiological and informatiometrical medical-technical means which have mortgaged theoretical, clinical-experimental and applied bases of the informational medicine, therefore a heading of RWD and RWT method in scientific and medical - preventive establishments will allow to study on an objective basis: influence of pathogenic signals of the sick person on the informational homeostasis of the healthy person (autoecology); regularity of involving (metastasis) of organs and systems in pathological process (endoecology); external environment influence (water, food stuffs, medicines, tobacco, physiotherapeutic procedure, industrial toxins, vibrations, etc.) on a state of the informational homeostasis of the person (exoecology). 3. Implementation of conceptual bases of the informational medicine will give effect: time and expenses reduction more than in 5 times at all stages of medical diagnostic; results of diagnostic allow to generate the program of improving provisions for concrete organs and systems therefore standards as diagnostics raise, and treatments; revealing of preclinical disease forms conditions for optimum and early conducting of preventive course of treatment; it is not required supplementary appropriation on the organization and the further functioning of RWD cabinet; high efficiency (1500 foreheads/years in one turn) RWD and RWT supply resources-economy process of treatment-and-prophylactic establish-

ment; reduction in expenditure on preventive maintenance, treatment and after treatment in 1,5-2 times at polyclinic and sanatorium stages of treatment; raise of standards of the treatment-and-prophylactic help at all stages of treatment-and-prophylactic establishments; reduction of treatment period of patients by all nosologies in 1,8 times.

Literature

1. N.D. Devyatkov, M.B.Golant, O.V.Beckiy. The millimetric waves and their role in the processes of vital functions. Moscow, Radio and connection, 1991.
2. M.A.Agadzhanian, R.M.Baevskiy, A.P.Berseneva. The Functional systems of organism and theory of adaptation: Announcer of restoration medicine, N. 3(9). Moscow, 2004, p. 4-11.
3. I.I.Yuzvishin. Informatsiologion or conformities to the law of informative processes and technologies in micro- and macrocosms of Universe. – M.: Radio and connection, 1996, 211 p.
4. I.I.Yuzvishin. Bases of informatsiologion. M.: the International publishing house "Informatsiologiya" and publishing house "High school", 2000, 516 p.
5. A.E.Bessonov. Millimetric waves in clinical medicine.: Research-practical guidance. Moscow. 1997, 338 p.
6. A.E.Bessonov, E.A.Kalmykova, B.A.Konyagin. Information medicine. Moscow, IIS "Sail", 1999. P. 592.
7. A.E.Bessonov, E.A.Kalmykova. Informative medicine. Second edition – Moscow: VIRU, 2003. - 656 p.
8. A.E.Bessonov, E.A.Kalmykova, A.T.Semeniy. Informative radio wave therapy. Atlas of user of apparatus MINITAG® and TUNING FORK. 3-rd edition, Moscow, 2009, 400 p.

Principles and new technologies of rehabilitation in stroke

L.A. Chernikova

Research Center of Neurology of RAMS, Moscow, Russia

Introduction. Rehabilitation of the patients after stroke is one of the actual problems of modern medicine. It is caused as the prevalence of a stroke all over the world (around 400 000 cases every year in Russia), and discoveries in the field of the fundamental sciences that confirmed a main role of the afferentation for development of plasticity in the CNS. The past fact promoted to rapid development and introduction of new rehabilitation technologies, such as the neuromuscular electrostimulation (NES), the robot-therapy, EMG feedback training etc. The purpose of the present research was to study of the efficiency of some new technologies in the acute and chronic phases after ischemic stroke (IS). **Materials and methods.** The safety and efficiency of the early and intensive NES of the paretic hand extensors have been studied at 29 patients with a first IS in the territory of middle cerebral artery (MCA). NES was made 20 min twice per day from the first 48 hours after stroke onset during 3 weeks. The safety of NES was assessed with diffusion/perfusion MRI control of lesion size, the influence of NES on the upper extremity recovery – with NIHSS, Motor assessment scale (MAS), Fugl-Meyer Scale (FMS), Ashworth Scale (AS) and Barthel Index (BI). Besides the safety and efficiency the early verticalization using tilt-table with integrated robotic stepping function ERIGO (Hocoma, Switzerland) have been studied at others 30 patients with a first stroke of anterior circulation territory, moderate to severe severity according to NIHSS 14±3,1. The safety was estimated using of the non-invasive monitoring of blood pressure, heart rate, oxygen saturation, and the efficiency – according to NIHSS, Motoricity index (MI), AS. The effects of the intensive gait training with the Lokomat system on the some clinical and kinematic parameters have been studied at 77 hemiplegic stroke subjects (mean age 53.6±10.4 years, mean duration of time from the stroke onset 47,2±33,4 days) with mild to moderate lower limb impairments. The effects of the gait training were assessed using the gait analysis system "Videoanalysis - Statokin" (Russia) and the clinical analysis (MI, AS, 10-m timed walking speed). In the chronic stroke period (up to 1 year), the opportunity of the functional reorganization of motor structures of the CNS during the learning of the precision grip by the Electromyographic biofeedback (EMG-BFB) technology has been studied at 32 patients (mean age 54,5 [50; 59]) with a first IS in the territory of MCA. CNS plasticity was assessed with fMRI, the influence of the EMG-BFB on the upper extremity recovery – with MAS, FMS, AS and BI. **Results.** The data show that in the acute phase of stroke NES of the paretic hand extensor muscles improved motor recovery of the upper limb and have no any harmful effect on to lesion size and cerebral perfusion (the diffusion/perfusion MR). It has been shown that the early verticalization with tilt-table ERIGO of the patients with IS is safe and feasible. It might be effective in reducing spasticity and decreasing the time of achievement the vertical position of patients after the ischemic stroke. After the gait intensive training with the LOKOMAT system, we noted the increase of MI for paretic leg at 59.8%, MI for body at 16.5%, the decrease of AS for 42.7% and the tendency

of the decrease of the expression of the circumduction gait strategy in paretic leg using the gait analysis system. The peculiarity of the functional reorganization of the motor structures of CNS (according to fMRI) and improvement motor recovery of the upper limb had been revealed after the training of the precision grip by the EMG-BFB technology. **Conclusion.** Introduction of new technologies in complex treatment in view of such principles of rehabilitation as the early beginning, a systematic, long and integrated approach, the attraction of active participation in treatment of the patient, the control of adequacy of loadings increases the efficiency of rehabilitation management and improves the recovery of patients both in acute, and in the chronic period after a stroke. At the same time, it is shown, that the degree of restoration of the impairments depends on the size and localization of the lesion, initial severity of neurological defect, a condition of cognitive dysfunctions and affective disorders, the laterality of the lesion, age of the patient, and also adequacy (intensity and volume) rehabilitation.

The efficacy of group communication treatment with aphasia: one local experience

C. Mirabelli, C. Caviggiola

Therapist Rehabilitation Service c/o ASL AL (Pr. AL)

Introduction. We examined the effects of group communication therapy on linguistic and communicative performance in adults specially with long-term aphasia or acired neurophatologies. **Materials and methods.** The patients were randomly treatment groups and one one modes of treatment. In the first group were balanced for age, education level, and initial aphasia severity. In five years thirty participants completed for 6 month treatment trials; on the other side treatment one on one. All patients received two hours of group communication weekly, provided by a speech language pathologist. The focus of treatment included increasing initiation of conversation and exchanging information using whatever using communicative means possible. Group treatment is a viable intervention for adults with a variety of acquired neurophatologies; using groups for intervention has been best established with person with aphasia and allows for a forms on activity limitations and participation restriction. **Results.** Five years thirty persons treatment this disomogenic group therapy has been described as a communication hellway house, a safe place to produce less than perfect speech and practice compensatory strategies to communicate in a coming full way, engaged in such activities a support, performance or movement groups in order to control the effects of social contact. A single treatment much more difficult and reduce souce conctat and participation. **Conclusion.** The results show that the group communication therapy in the a chronic stage after stroke is a dynamic process. Prior to immediately after and one year after is process after training and treatment success remained highly stable at following, instead of treatment success predicted by increased activity and participation in life setting.

References

1. Elman Bernstein – RJ Eleman "The efficacy of group communication treatment in adults with chronic aphasia". - Journal of Speech, Language, and Hearing research Vol. 42, 411/419, April 1999
2. Kearns, K, Elman R. (2001) Chapter-4 "Group therapy for aphasia: Theoretical and practical, considerations in R. Chapey Ed. Language intervention.
3. Strategies in aphasia and related heurogenic communication disorders 4th ed. Pp. 316/336. Lippimcai/Williams e Wilkins: Philadelphia.

Morbo di Parkinson: Evaluation FIM and UPDRS before and after treatment riabilitativo for a long time term.

A.M. Rivignani Vaccari¹, A. Spiezia², G. Ferraro³, C. Esposito⁴, F. Gimigliano⁵, A. Riccardo⁶, M. Rocco e collaborazione di A. Giugliano⁸

¹Dirigente Medico Fisiatra, Sede di lavoro: ASL NA 3 SUD ex NA 4, Regione Campania.

²Specialista Prescrittore, Fisiatra, Arzano (NA), Sede di lavoro: ASL NA 2 ex NA 3, Regione Campania.

³Dirigente Medico, Sede di lavoro: Responsabile UOAR Distretti 77-78-79, San Giuseppe Vesuviano, ASL NA 3 SUD ex NA 4, Regione Campania.

⁴Dirigente Sociologo, ASL NA 3 SUD ex NA 4, Regione Campania.

⁵Medico, Specialista in Fisiatra, Ricercatrice presso Dipartimento Ortopedia Traumatologia e Riabilitazione, SUN.

⁶Specializzando in Medicina Fisica e Riabilitativa presso Dipartimento Ortopedia Traumatologia e Riabilitazione, SUN.

⁷Medico Chirurgo, presso Università Federico II di Napoli, Clinica Neurologica.

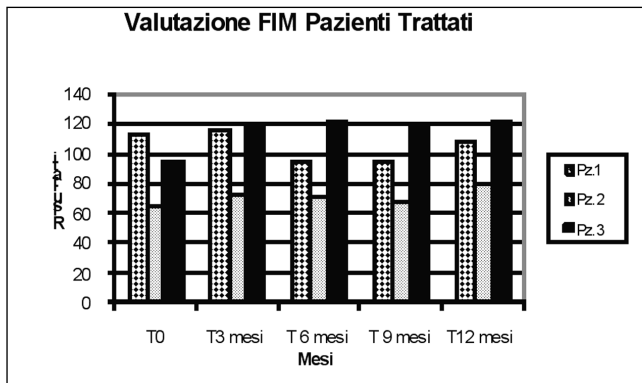


Figure 1.

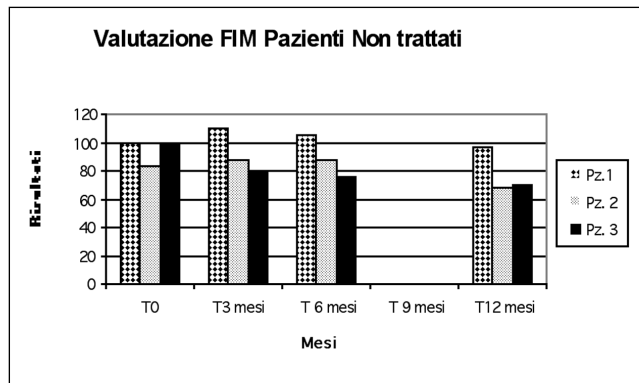


Figure 2.

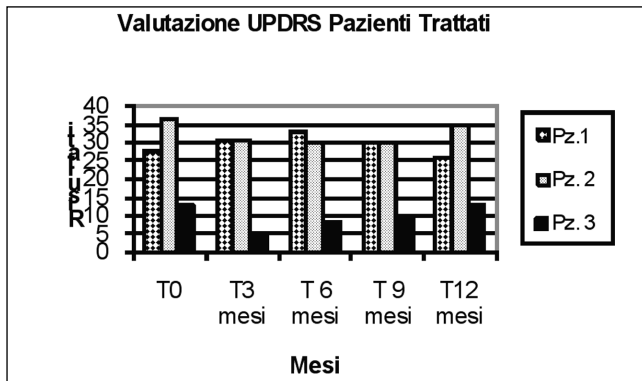


Figure 3.

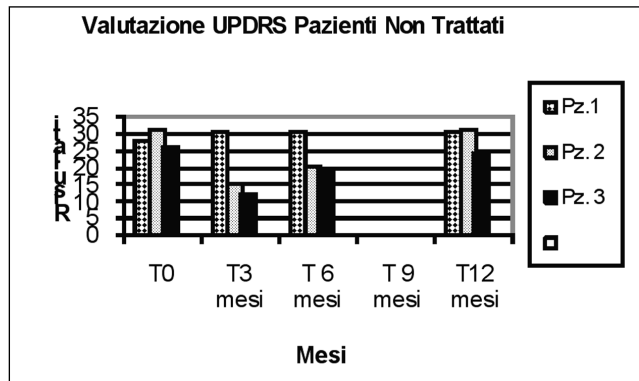


Figure 4.

⁸Amministrativo, UOAR Distretto 52, ASL NA 3 SUD.

There is no evidence to confirm the value of rehabilitative treatment in Parkinson Disease (PD), except in combination with drug therapy. This despite a not insignificant percentage of patients turn to medical physiatrist to improve those functions that the pathology compromises progressively (posture, balance, gait, ability to change postural reflexes parachute, breathing ...). Our aim is to demonstrate that patients with PD benefit from rehabilitation, particularly for activities of daily living. According to the World Health Organization are four million worldwide, Parkinson's patients. In Europe, the overall prevalence is 1.6 cases per 100 over 65. One person in 500 develops the disease, which is, even today, the fourth disorder of the nervous system by diffusion after epilepsy, cardiovascular disease and Alzheimer's disease. With an aging population is much worse: in Europe, in 2020, there will be 40% more than in 1990 over seventy enough to make Parkinson's a priority issue for public health with considerable healthcare costs. The average incidence of this disease is about 20 new cases per year per 100,000 inhabitants, with a peak of disease at 70 to 75 people. In most cases the symptom is the onset of tremor, but sometimes it's onset is characterized by motor awkwardness, a sense of stiffness. The triad consists of pivotal disease: tremor, rigidity and akinesia with variable gravity. The tremor is typically at rest disappeared during voluntary movements, is worse in situations of emotional stress and absent in sleep. The study lasted two years, from April 2007 to April 2009. Patients were 6, homogeneous age, four males and two females, disease duration, severity of symptoms (according to the Hoehn-Yahr Scale, had a degree of disease between the first and third stage) and were en Hon. The rehabilitation program/authorized, provided the achievement of objectives and the results were to be quantified by appropriate rating scales. The patient underwent follow-up to check if their clinical evolution with a consequent adjustment to the therapeutic strategy. In fact, patients were evaluated before and after three months of rehabilitation treatment in outpatient settings and after three months of treatment enabled in their home with the administration of several rating scales, in particular, we focused on standards and FIM UPDRS. At the end of six months of study, the physiatrist, after appropriate follow-up, to divide patients into two groups, those treated and not in those receiving repeated the same

rehabilitative treatment program already undertaken in the first six months, in order to compare the outcome between the two groups.

The exercises were divided into four groups according to the objectives pursued: 1. Stretching exercises and mobilization 2. Functional Exercises 3. Balance exercises 4. Coordination exercise. At the end of treatment, patients were interviewed and checked with rating scales. Many studies have found that several patients when returning to their home not to continue the exercise program they assigned. Keeping this present, from monthly surveys conducted, was given the opportunity to the subjects recruited to be able to address the various difficulties encountered during their rehabilitation autonomous. So if even remotely, the patients were solicited later in the rehabilitation program / authorized planned. The purpose of our study through the different scales of assessment is to demonstrate the achievement of greater autonomy in activities of daily living, the same time reduce the isolation. Follow a rehabilitation program and get good increases in the patient's interest to something that is outside of everyday life.

References

Chery-Waters "Malattia di Parkinson, diagnosi e trattamento" 2003 ed Professional Communications nc;
 Hartmann "Parkinson, l'approccio riabilitativo multidisciplinare" 2000 ed Editrice Speciale Riabilitazione;
 Stocchi F. Morbo di Parkinson. Strategie terapeutiche e qualità della vita del malato. Roma: Il pensiero scientifico Editore. (1998).

Therapeutic modalities of rehabilitation in the treatment of non-surgical temporomandibular joint disorders

S. Pimentel^{1,2}, T. Toste²

IE-mail address: sacapi@hotmail.com; telephone number: 351912631329

²Department of Physical and Rehabilitation Medicine of Hospital de São João, Porto, Portugal

Temporomandibular joint disorders include a heterogeneous group of conditions, characterized by acute or chronic musculoskeletal pain and dysfunction of the masticatory system.

Temporomandibular joint disorders are classified in three categories: myofascial pain (the most common T.M.J. disorder; it involves pain or discomfort in the masticatory muscles; it results from several conditions which increase muscular tension and spasm; and it is believed to be a physical manifestation of psychological stress); internal derangement of the temporomandibular joint (which involves displacement or dislocation of the disc or injury to the mandibular condyle); and arthritis (degenerative/inflammatory pathologies of the temporomandibular joint). The impact of non-surgical temporomandibular joint disorders in the quality of life justifies the increasing interest on its treatment, which is based mainly in conservative and reversible treatments, including treatments of Physical and Medical Rehabilitation. The authors make a systematic review on the several therapeutic modalities of rehabilitation available and effective in the treatment of non-surgical temporomandibular joint disorders. The most relevant findings are: there is little evidence favoring the use of ultra-sounds; in the short-term, mid-laser therapy may be more effective than other electrotherapy modalities; trans-electrical nerve stimulation is effective in pain relief; physical agents have better results in mandibular opening than in pain relief; the association of physical agents to kynesotherapy techniques results in higher analgesic efficacy and increase in pain-free mandibular opening; the following have a good effectiveness: active mandibular exercises and manual mobilizations (these are the basis of the rehabilitation treatment of non-surgical temporomandibular joint disorders), programs which include proprioceptive re-education, relaxation techniques, biofeedback and electromyographic training, and programs which include active mandibular exercises, manual therapy, postural correction and relaxation techniques.

References

1. TMJ Disorders - Publication of the National Institute of Dental and Craniofacial Research, June 2006 @ <http://www.nidcr.nih.gov/nidcr2.nih.gov/Templates/CommonPage.aspx?NRMODE=Published&NRN>
2. Guarda-Nardini L, Manfredini D, Ferronato G. Total temporomandibular joint replacement: A clinical case with a proposal for post-surgical rehabilitation. *Journal of Cranio-Maxillofacial Surgery*. 2008; 36: 403-409.
3. <http://www.firsthealth.org/Health%20Services/Rehabilitation%20Services/Physical%20Therapy/TMJ%20Rehabilitation.htm>
4. <http://www.umm.edu/altmed/articles/temporomandibular-joint-000162.htm>
5. Kalamir A et al. Manual therapy for temporomandibular disorders: A review of the literature. *Journal of Bodywork and Movement Therapies*. 2007; 11: 84-90.
6. Sheon RP. Temporomandibular joint dysfunction syndrome @ http://www.uptodateonline.com/online/content/topic.do?topicKey=painrhe u/5149&selectedTitle=1~54&source=search_result#11
7. Luis L. Patologia disfuncional da ATM – abordagem fisiática. *Revista da Associação dos Médicos Estomatologistas Portugueses*. 2004; 6: 41-45.
8. Turp JC, Komine F, Hugger A. Efficacy of stabilization splints for the management of patients with masticatory muscle pain: a qualitative systematic review. *Clin Oral Invest* 2004; 8:179.
9. The American Academy of Craniomandibular Disorders. Craniomandibular Disorders: Guidelines for Evaluation, Diagnosis, and Management, McNeill, C (Ed), Quintessence Publishing Co, Chicago 1990.
10. Feine JS, Lund JP. An assessment of the efficacy of physical therapy and physical modalities for the control of chronic musculoskeletal pain. *Pain*. 1997; 71: 5-23.
11. van der Windt DA, van der Heijden GJ, van den Berg SG, et al. Ultrasound therapy for musculoskeletal disorders: a systematic review. *Pain*. 1999;81:257-271.
12. Bjordal JM, Couppe C, Chow RT, et al. A systematic review of low level laser therapy with location-specific doses for pain from chronic joint disorders. *Aust J Physiother*. 2003;49:107-116.
13. Medicott MS, Harris SR. A systematic review of the effectiveness of exercise, manual therapy, electrotherapy, relaxation training and biofeedback in the management of temporomandibular disorders. *Phys Ther*. 2006; 86 (7): 955-973.
14. Nunez SC et al. Management of mouth opening in patients with temporomandibular disorders through low-level laser therapy and transcutaneous electrical neural stimulation. *Photomedicine and Laser Surgery*. 2006. 24: 45-49.
15. De Laat A, Stappaerts K, Papy S. Counseling and physical therapy as treatment for myofascial pain of the masticatory system. *J Orofac Pain* 2003; 17:42.
16. Sheon RP, Moskowitz RW, Goldberg VM. *Soft Tissue Rheumatic Pain: Recognition, Management, Prevention*, 3rd ed, Williams & Wilkins, Baltimore 1996.
17. <http://www.drjeffreytucker.com/Fitness/Rehabilitation/tmj.asp>
18. McNeely ML, Armijo Olivo S, Magee DJ. A systematic review of the effectiveness of physical therapy interventions for temporomandibular disorders. *Phys Ther*. 2006; 86: 710-725.
19. Crider A, Glaros AG. A meta-analysis of EMG biofeedback treatment of temporomandibular disorders. *Journal of Orofacial Pain*. 1999; 13(1): 29-37.
20. Crider A, Glaros AG, Gervitz RN. Efficacy of biofeedback based treatments for temporomandibular disorders. *Applied Psychophysiology and Biofeedback*. 2005; 30(4): 333-345.

Recovery of functional status following stroke in a tri-ethnic population

????
????

Objective. To investigate recovery of functional status for white, black and Hispanic patients with stroke between admission to, and discharge from, inpatient medical rehabilitation and at 3 and 12 month follow up. **Materials and methods.** 688 adults aged 55 or older with stroke admitted to one of eleven inpatient medical rehabilitation facilities in the U.S. were interviewed at four time points including admission to and discharge from an in-patient medical rehabilitation facility, and 3 and 12 months post discharge. **Results.** The mean age was 72.5 years. 79.2% were non-Hispanic white and 52.3% were men. For the total sample, FIM ratings increased from admission to discharge, and from discharge to 3 month follow-up, with little recovery occurring between 3 and 12 months. For those >75, Black patients had mean Total FIM rating that was 7.61 points lower than whites; Hispanics had a mean Total FIM rating that was significantly lower than whites (20.4 points). At the 12 month follow-up, black and Hispanic patients relative to white patients had lower mean Total FIM ratings of 3.4 and 18.0 points. In repeated measures analysis of variance, ethnic group, age, length of stay, stroke type, and medical comorbidities were significant predictors of total FIM ratings over the 4 time points. **Conclusion.** Differences in recovery of functional status between older Hispanics and other older ethnic groups may be due to individual factors and conditions in the post discharge environment. The current findings provide encouraging results on narrowing the ethnic disparity gap.

References

1. American Heart Association. Heart Disease and Stroke Statistics- 2007 Update. 2007. Dallas, Texas, American Heart Association. Ref Type: Report
2. Ottenbacher KJ, Campbell J, Kuo YF, et al. Racial and ethnic differences in postacute rehabilitation outcomes after stroke in the United States. *Stroke*. 2008;39:1514-1519.
3. Chiou-Tan FY, Keng MJ, Jr, Graves DE, et al. Racial/ethnic differences in FIM scores and length of stay for underinsured patients undergoing stroke inpatient rehabilitation. *Am J Phys Med Rehabil*. 2006;85:415-423.
4. Kelly PJ, Stein J, Shafiqat S, et al. Functional recovery after rehabilitation for cerebellar stroke. *Stroke*. 2001;32:530-534.
5. Patel AT, Duncan PW, Lai SM, et al. The relation between impairments and functional outcomes poststroke. *Arch Phys Med Rehabil*. 2000;81:1357-1363.
6. Spencer, G. Bureau of the Census: projections of the population of the United States by age, sex, and race. 1018. 1989. Washington D.C., U.S. Government Printing Office. Current Population Reports, Series P-25. Ref Type: Report
7. Kuwabara K, Matsuda S, Imanaka Y, et al. The effect of age and procedure on resource use for patients with cerebrovascular disease. *J Health Serv Res Policy*. 2008;13:26-32.
8. Dulisse B. Older drivers and risk to other road users. *Accid Anal Prev*. 1997;29:573-582.
9. Heinemann AW, Linacre JM, Wright BD, et al. Relationships between impairment and physical disability as measured by the functional independence measure. *Arch Phys Med Rehabil*. 1993;74:566-573.
10. Smith PM, Illig SB, Fiedler RC, et al. Intermodal agreement of follow-up telephone functional assessment using the Functional Independence Measure in patients with stroke. *Arch Phys Med Rehabil*. 1996;77:431-435.
11. Carter, GM, Relles, DA, Buchanan, JL, et al. A classification system for inpatient rehabilitation patients: a review and proposed revisions to the Functional Independence Measure-Function Related Groups. Project memo (Final 31 Aug 95-3 Jul 97). NTIS Order Number PB98-105992. 1997. Santa Monica, CA, RAND Corp. Ref Type: Report
12. Stineman MG, Hamilton BB, Granger CV, et al. Four methods for characterizing disability in the formation of function related groups. *Arch Phys Med Rehabil*. 1994;75:1277-1283.
13. Stineman MG, Escarce JJ, Goin JE, et al. A case-mix classification system for medical rehabilitation. *Med Care*. 1994;32:366-379.
14. Hamilton BB, Laughlin JA, Fiedler RC, et al. Interrater reliability of the 7-level functional independence measure (FIM). *Scand J Rehabil Med*. 1994;26:115-119.
15. Ottenbacher KJ, Hsu Y, Granger CV, et al. The reliability of the functional independence measure: a quantitative review. *Arch Phys Med Rehabil*. 1996;77:1226-1232.
16. Sands LP, Landefeld CS, Ayers SM, et al. Disparities between black and white patients in functional improvement after hospitalization for an acute illness. *J Am Geriatr Soc*. 2005;53:1811-1816.
17. Stansbury J, Jia H, Williams L, et al. Ethnic disparities in stroke: Epidemiology, acute care, and post-acute outcomes. *Stroke*. 2005;36:374-386.
18. Stineman MG, Shea JA, Jette A, et al. The Functional Independence Measure: tests of scaling assumptions, structure, and reliability across 20 diverse impairment categories. *Arch Phys Med Rehabil*. 1996;77:1101-1108.
19. Smedley BD, Stith AY, Nelson AR. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care (Institute of Medicine)*. Washington, DC: National Academy Press; 2003.
20. Granger CV, Cotter AC, Hamilton BB, et al. Functional assessment scales: a study of persons after stroke. *Arch Phys Med Rehabil*. 1993;74:133-138.

21. Kelson M, Ford C, Rigge M. *Stroke rehabilitation : patient and carer views, a report from the Intercollegiate Working Party for Stroke*. London: Royal College of Physicians and College of Health; 1998.
22. Rodgers H, Francis JJ, Brittain K, et al. Who cares? - caring for the carers of stroke patients. *Disabil Rehabil*. 2007;29:425-427.

Evaluation of Pure Tone Audiometry (250-16000 Hz) in Middle-Aged Subjects with Type 2 Diabetes Mellitus

R.Zeinolabedini¹, B.Forogh², M.Akbari³

¹MSc in Audiology, Faculty of Rehabilitation, Iran University of Medical Sciences, Tehran, Iran

²Lecturer/Associated Professor of Physical and Rehabilitation Medicine, Chairman of Physical and Rehabilitation Medicine Department, Iran University of Medical Sciences, Tehran, Iran

³MSc in Audiology, Board Member of Faculty of Rehabilitation, Iran University of Medical Sciences, Tehran, Iran

Background. Diabetes mellitus is a common metabolic disease that characterized by abnormal consumption of glucose because of insulin insufficiency. The literature related to diabetes mellitus and hearing impairment is inconsistent. An incidence of hearing impairment as high as 55 percent, particularly progressive high-frequency sensorineural hearing loss is reported by some investigators. Other authors, however, have found no significant abnormalities among these patients. There are few studies to investigate the relation between type 2 diabetes and hearing loss in middle-aged subjects. In current study we assessed the hearing loss in middle-aged type 2 diabetic patients using conventional pure tone audiometry (250-8000Hz) and high-frequency audiometry (10-16KHz). **Materials and methods.** Hearing loss was evaluated in 30 middle-aged patients with type 2 diabetes mellitus and 30 age and sexes matched healthy subjects using conventional pure tone audiometry at six determined frequencies between 0.25 and 8KHz (0.25, 0.5, 1, 2, 4, and 8KHz). Ultra high hearing pure tone thresholds were determined by high-frequency audiometry at frequencies between 10 and 16KHz (10, 12, 14, and 16KHz). Diabetic patients were classified by their disease duration. **Results.** Diabetic patients showed normal hearing thresholds at 250-8000Hz. There was a significant statistical difference at 10-16 KHz between diabetic and control groups ($P<0.05$). It was a significant correlation between duration of disease and hearing thresholds of high-frequency audiometry at frequencies between 10-16KHz ($p<0.05$). **Conclusion.** Evaluating the auditory thresholds in a wide frequency range can be useful for diagnosis of hearing diseases which could not be diagnosed by conventional audiometry (250-8000 Hz) at early stages.

Impact of neuromuscular assessment in rehabilitation program at patients with multiple sclerosis

Ligia Rusu, Mihai Dragomir

University of Craiova, Sport Medicine and Kinesiology Department, Romania

Introduction. Skeletal muscle has three types of muscle fibers: I, IIA, IIB. Percent of these fibers are not the same in the muscle and depend of muscle activity type. Also in skeletal muscle exist muscle fiber type IIC, which is the intermediar fibers and has a high potential for change in fiber types I, IIA or IIB. This change means muscle plasticity and depend of genetic program, endocrine influence, physical exercise. Muscle fibers can be change regards types of fibers depend of what do we want to have, if we create a rehabilitation program for increase percent of muscle fibers type I or type II. This means to have a good assessment of muscle function aspect that is very important in multiple sclerosis. In multiple sclerosis (MS) muscle weakness is one of the most problem for functional independence because of nervous disorders and damage of nervous conductivity and also intramuscular conductivity of nervous impulse. In this moment MRI and electromyography can assess the status of muscle fibers but no more information regards possibility to transform the muscle fibers for increase the percent of muscle fibers type I for increase also the fatigue resistance. The aim of this paper is to present the neuromuscular aspects in MS using tensiomyography (TMG), for assess also the evolution of muscle disorders during MS. **Materials and methods.** Our studied included 20 patients with MS, mean age 40 years. The diagnostic of MS was made eleven years ago and they were assess using for the first level, clinical neurologic evaluation. Our assessment was focussed on evaluation lower limb functionality. In this context we observed that

our patients presented motor and sensitive syndromes, important motor inefficiency, balance impairments, that had impact on column spine, because more of them presented low back pain. We considered that begin a rehabilitation program can be most useful if we make a good assessment of muscle fibers for determining contractile properties, for assess the muscle fibers composition. Also we can obtain information about muscle speed contraction after electrostimulation, fatigue resistance and recruitment of motor units. By TMG we can observe the muscle response after electrostimulation, assess of reports between muscle fibers type I and type II. We made electrostimulation using surface electrodes 5/5cm Platinum. Intensity was from 10Ma-65mA, time 1ms. So was possible to have an isometric contraction. Muscle response was detect by sensor G40, RLS Inc., on muscle belly, muscle force was 2 (on scale 0-5). After muscle stimulation will be develop a muscle displacement that will be record. Amplitude of displacement is in according with muscle force and percent of muscle fibers type I. TMG parameters: latency time (Td) normal 28,7ms, contraction time (Tc) normal 32,83+/-4,5ms, sustain time (Ts), relax time (Tr) and displacement (Dm- mm) normal 8mm. For Tr and Ts doesn't exist normal values like reference, but they can be use like elements for monitoring muscle function. Also after these measurements we can evaluation lateral symmetry (normal 80%) and functional symmetry (normal 65%) at lower limb joints. In this study we made measurements at lower limb muscles: quadriceps, tibialis anterior, gastrocnemius, biceps femoris. This is the first study and so we choice especially next parameters: Tc, Td, Dmm. **Results.** Reports of our results were made in according with normal values for lateral and functional symmetry and also in according with normal values for others parameters, that we obtained at normal subjects (same age). Regards Tc we observed that the average was 44ms, more than normal value; Td average value was 30ms, that means a short increase of latency, but is closely normal values; Dm average was 4,5mm that means a values under the normal, means a bad response after stimulation; Tr and Ts had high values than normal. We must say that all these average values of these parameters are important for monitoring the evolution of muscle change in MS and allows the monitoring of rehabilitation program. Which are the signficity of these results? How we saw Tc in according with Dm means a high percent of muscle fibers type II. This is an accord with others studies regards MS, that included MRI investigation, enzymatic evaluation and muscle biopsy. These studies spoke about the decrease of muscle fibers type I and increase of muscle fibers type II with all its subtype. Increase of Td means an lately response after electrostimulation. Increase of Ts is in accord probably with increase of muscle tonus or spasticity and also increase of Tr is in accord with a very lower relax capacity and also is significant because means a short recruitment of motor units. Regards lateral and functional symmetry we observed for lateral symmetry average values between 38%-71% quadriceps, 85%-97% for biceps femoris, 26-30% tibialis anterior, 70-77% for gastrocnemius. For functional symmetry average values were: for knee 44-66%, ankle 39-74%, foot 26%. **Conclusion.** We observed that all patients presented change in muscle balance at knee side where can also observed flexum position. Also we observed change of TMG values that help us to create a rehabilitation program focus on physical exercises for increase percent of muscle fibers type I. For this we propose, based of TMG results assessment, a physical exercises including aerobic exercises that can involve increase the cellular mitochondria and capillary density of muscle fibers. Typical endurance exercises include aerobic activities like running, jogging, swimming, cycling. Circuit training involves repeated circuits of several different exercises, with very little rest, and is another way of training for endurance.

References

- Berteanu M., Biofeedback-ul electromiografic baze neurofiziologice și aplicații în recuperarea medicală, Editura Universitară Carol Davila, București, 2006
- Kandel E.R., Swartz J.H., Thomas M.J., Principles of Neural Science, McGraw-Hill Publishing Co; 4RevEd.edition, 2000.
- Guzton Ac, Hall Je, Textbook of Medical Phziology, 10th Edition W.B.Saunders, 2000.
- Lieber RL, Skeletal Muscle Structure and Function: Implication for Rehabilitation and Sports Medicine, Baltimore: Williams and Wilkins, 1992
- Lillioja S, Young Aa, Culter Cl, Ivy Jl, Abbott Wg, Zawadzki Jk, Yki Jh, Christin L, Secomb Tw, Bogardus C, Skeletal muscle capillary density and fiber type are possible determinants of in vivo insulin resistance in man. *J Clin Invest* 80:415-424, 1987.
- Beck-Nielsen H, Mechanisms of insulin resistance in non-oxidative glucose metabolism: the role of glycogen synthase. *J Basic Clin Physiol Pharmacol* 9:255-279, 1998.
- Kriketos AD, Pan Da, Sutton Jr, Hoh Jf, Baur La, Cooney GJ, Jenkins Ab, Storlien LH: Relationships between muscle membrane lipids, fiber type, and enzyme activities in sedentary and exercised rats. *Am J Physiol* 269:R1154-R1162, 1995.

8. Henning, A., Stålberg, E., Gjerstad, D.M., Jakobsen, J, Association of muscle strength and electrophysiological measures of reinnervation in diabetic neuropathy, *Muscle and Nerve*, Volume 21, Issue 12, page 1647-1654, 1998.
9. Dahmane, R., Valenčič, V., Knez N., Eržen, I., Evaluation of the ability to make non-invasive estimation of muscle contractile properties on the basis of the muscle belly response. *Med Biol Eng Comput*, 39, 51-55, 2000.
10. Dahmane, R., Djordjević, S., Šimunić, B., Valenčič, V., Spatial Fiber Type Distribution in Normal Human Muscle Histochemical and Tensiomyographical Evaluation. *Journal of Biomechanics*, 38, 2451-2459, 2005.
11. Zagorc, M., Karpljuk, D., Friedl, M, Analysis of functional loads of top sport dancers. In: D. Milanovic (Ed), *Kinesiology of 21st century* Proceedings, Dubrovnik, University of Zagreb, Faculty of kinesiology, 240-243, 1999.
12. Dahmane R, Knez N, Valenčič V, Eržen I., Evaluation of the ability to make non-invasive estimation of muscle contractile properties on the basis of the muscle belly response. *Med Biol Eng Comput*, 39: 51-55, 2000.
13. Dahmane R, Djordjević S, Šimunić B, Valenčič V, Spatial fiber type distribution in normal human muscle: Histochemical and tensiomyographical evaluation, *J Biomech*, 38(12): 2451-2459, 2005.
14. Grabljevec K, Šimunić B, Kerševan K, Križaj D, Koršorok V, Gregorič M., Detection of contractile properties of chronically spastic muscles in subjects after traumatic brain injury with Tensiomyography (TMG) method, *Rehabilitation sciences in the new millenium challenge for multidisciplinary research: collection of works presented at the 8th Congress of European Federation for Research in Rehabilitation*, Ljubljana, Slovenia; 139-143, 2004.
15. Bell Gi, Kayano T, Buse Jb, Burant Cf, Takeda J, Lin D, Fukumoto H, Seino S., Molecular biology of mammalian glucose transporters, *Diabetes Care* 13:198-208, 1990.
16. Gaster M, Poulsen P, Handberg A, Schröder Hd, Beck-Nielsen H., Direct evidence of fibertype dependent GLUT-4 expression in human skeletal muscle. *Am J Physiol*. 278:E910-E916, 2000.
17. Hickey Ms, Carey Jo, Azevedo JI, Houmard Ja, Pories Wj, Israel Rg, Dohm GL: Skeletal muscle fiber composition is related to adiposity and in vitro glucose transport rate in humans. *Am J Physiol* 268: E453-E457, 1995.
18. Zierath Jr, He L, Guma A, Odegaard We, Klip A, Wallberg HH., Insulin action on glucose transport and plasma membrane GLUT4 content in skeletal muscle from patients with NIDDM. *Diabetologia*, 39:1180-1189, 1996
19. Marette A, Burdett E, Douen A, Vranic M, Klip A., Insulin induces the translocation of GLUT4 from a unique intracellular organelle to transverse tubules in rat skeletal muscle, *Diabetes*, 41:1562-1569, 1992.
20. Rusu Ligia-Intervenția kinetică în afecțiunile sistemului neuromioartrokinetic, *Ediura Universitaria, Craiova*, 2007.

Evidence based approach to the management and rehabilitation of osteoarthritis

E. Ilieva

Medical University Hospital, Plovdiv, Bulgaria

Introduction. The aim of the author is to present the up-to-date evidence based knowledge about the prevention, management and rehabilitation of knee and hip osteoarthritis, including joint replacement in the aspect of the ICF. **Materials and methods.** The author makes critical review of the data from systematic reviews, meta-analyses of RCT and existing guidelines and presents evidence-based recommendations. **Results.** The risk factors for osteoarthritis, the interventions and the recommendations according to the grade of evidence are presented. Platinum level of evidence was found about the benefit of land based exercise in terms of reduced pain and improved function comparable to non-steroidal drugs. Aquatic exercises have mild to moderate effect on function and quality of life. High level of evidence was found about the effect of low-impact aerobic fitness and strengthening exercises. There is evidence of high to moderate quality that TENS, laser therapy, interferential currents have good effect on pain and function. Ultrasound therapy has low short term effect on pain and mobility. Pulsed electromagnetic field improves function, especially ADL. There is silver level evidence that early multidisciplinary postoperative rehabilitation after joint replacement improves outcome at the level of activity, but not on participation, based on the ICF model. **Conclusion.** There are good level of evidences about the different interventions in patients with osteoarthritis, but there are still a lot of controversies concerning physical therapy and rehabilitation. Further studies are needed for evidence based application of the physical agents.

References

1. E. Roddy et al. Changing lifestyles and osteoarthritis: what is the evidence. *Best Pract. Res. Clin. Rheum.* 2006 , 20,1,81
2. Bjordal JM et al. Short term efficacy of physical interventions in osteoarthritic knee pain. A meta-analysis of RCT. *BMC Musc. Dis.* 2007, 8
3. P. Vavken, O. Schuhfried. Effectiveness of PEF therapy in the management of OA; a metaanalysis of RCT. *J Rehab Med* 2009, 41
4. Brander V, Stulberg SD: Rehabilitation after hip and knee joint replacement: an evidence-based approach to care. *Am J Phys Med Rehabil.* 2006;85

Effects of postural balance training on dynamic stability scores in neuropathic patients with type 2 diabetes

H. Salsabili¹, F. Bahrpeyma², B. Forugh³

¹ *gisha bridge, Tarbiat modares University, Tehran, Iran*

² *gisha bridge, Tarbiat modares University, Tehran, Iran*

³ *Behafarin street, valiasr square, Firuzgar hospital, Tehran, Iran*

Background and Purpose. Neuropathic patients with type 2 diabetes experience damage to their nerves (1) which in long time cause deficits in proprioception and then problems in controlling their dynamic posture in standing (2). This make question for us, if we design balance training protocol according to the ecological and three stage Fitt's and posner motor learning theories, is it possible to improve their dynamic postural control .Karl Newell from both systems and ecological motor control theories create a theory of motor learning based on the concept of search strategies. He suggested that motor learning is a process that increases the coordination between perception and action in a way that is consistent with the task and environmental constrains (3). Fitt's and posner motor learning theory related to the stages of motor skills(4).Because these patients rely on vision more than normal people (5),then the other object of study is to evaluate that, if it is possible to make these training just for improving proprioception without improving reliance to vision with biofeedback. For these purposes we used six balance training exercises on Biodex stability system which has extrinsic, knowledge of result biofeedback and a scaled tilt board(6). **Design.** quasi experimental, longitudinal study. **Participants.** 19 neuropathic patients aged between 40-70 years with type 2 diabetes were recruited for this study. Patients neuropathy were diagnosed by nerve conduction velocity tests .Inclusion criteria for patients were having controlled type 2 diabetes more than 2 years. Their FBS test results must had been more than 110mg/dl, Valk neuropathy score more than 2(7). The patients who had orthopedic or neurological disorders, heart failure and autonomic neuropathy, retinopathy, scars under their feet or BMI score more than 40, were excluded from this study. **Materials and methods.** In our study patients evaluated 3 times. First evaluations included descriptive information such as age, sex, height, weight, BMI, Valk score, diabetic history and postural control scores acquired from Biodex stability system. After 3 weeks they were evaluated for the second time by Valk score and Biodex stability system (BBS) scores, Third evaluation was done after 3 weeks again when the patients had been trained with biodex balance training exercises for 10 sessions. Trainings were 3 times a week and took 30 minutes for every session. At the beginning of each session patient's blood sugar (BS) had been controlled. It should not be less than 7.8mmol/lit. Trainings consist of 2 limits of stability trainings, 3 weight shifting trainings and 1 standing training without biofeedback. All the time we let the patients to find the best strategy for standing on BBS platform. Our goals for designing these exercises were used to oblige patient to keep their postural orientation and postural equilibrium, using ankle and hip strategy, proprioception and visual biofeedback. All trainings progress from easy to hard by changing the stability level through sessions. These progressions tuned according to the quality of doing the exercise by patients. Stability indices between three sessions and with and without visual biofeedback (WB, NWB) conditions were compared in their within subject effects with repeated measure ANOVA and with bifactorial repeated measure ANOVA and mukhley test. **Main Outcome Measure(s):** each of primary outcome means were age(=56) ,height(=164 cm), weight(=76.52kiloe), BMI(=28.33), diabetic history (11.84 year). **Results.** Diabetic neuropathic patients showed lower walk scores in the third session but the difference between three sessions was not significant (p=0.065). Stability indices acquired from BBS included overall stability index (OSI), anteroposterior stability index (APSI) and mediolateral stability index (MLSI). In the within subject effects analysis, they showed significant differences between three sessions in WB condition (p<0.001 for OSI, p<0.001 for APSI and p<0.001 for MLSI). All of these indices reduced after balance trainings in neuropathy diabetic patients. Stability indices had significant differences between three sessions in NWB condition. These indices included overall stability index, anteroposterior index and mediolateral index (p<0.001 for OSI, p<0.001 for APSI and p=0.016 for MLSI). All of these indices reduced after balance trainings in our subjects. In the within subject effects analysis for assessing the effect of WB/NWB with repetition of sessions, the differences were not significant (p=0.253 for OSI, p=0.175 for APSI, p=0.918 for MLSI). **Conclusion.** These results show that although the walk scores showed no significant difference but with BBS trainings according to motor learning hypotheses we could get lower scores which mean it is probable that neuropathy severity was decreased. As well as, improvement in dynamic balance scores in both WB and NWB

showed the effectiveness of task oriented balance trainings which use motor and cognitive strategies.

In the analyses patients didn't show more reliance to vision. This result let us to think that improvement in dynamic balance control is due to improvement in proprioception modalities than visual system.

References

1. Said G. Diabetic neuropathy- a review. *Nature Clinical Practice*. June 2007; 3(6):331-340.
2. Bonnet C, Carello C, Turvey MT. Diabetes and postural stability: Review and Hypotheses. *Journal of Motor behavior* 2009; 41(2):172-190.
3. Newell KM. Motor skill acquisition. *Annual Review Psychology* 1991; 42:213-237.
4. Fitts PM, Posner MI. *Human performance*. Belmont, CA; Brooks/ Cole, 1967.
5. Boucher P, Bard C, Tesdale N, Fleury M, Courtemanche R. Postural stability in diabetic polyneuropathy. *Diabetic Care* 1995; 18(5):638-645.
6. Arnold BL, Schmitz RJ. Examination of Balance Measures Produced by the Biodex Stability System. *Journal of Athletic training* 1998; 33(4):323-327.
7. Valk GD, Grutenhuis PA, van Eijk JTM, Bouter LM. Methods for assessing diabetic polyneuropathy: validity and reproducibility of the measurement of sensory symptom. *Diabetic research and clinical practice* 2000; 47:87-95.

Observational study about vertebral fractures in patients with hip fractures by fragility

A. Reda¹, M.G. Bartoletti²

¹U.O. Fkt Distretto Sanitario Rogliano- ASP, Cosenza

²Centro di Riabilitazione "Biolife", Cosenza

Introduction. The osteoporosis disease is characterized by bone fragility and increased fracture risk; the woman are affected by it more than men. The bones are broken without an important trauma or, even more, like the vertebral fractures, without trauma. The vertebral fractures are a lot dangerous because they don't provoke pain or provoke weak pain. Instead, the hip fractures are often the first expression of osteoporosis disease, because it's impossible not to do diagnosis and we can understand the skeletal fragility from that. Our thought is that, in lot of these patients, the hip fracture isn't the first fracture and, first of all, the vertebral fractures go ahead the hip fractures. Not to doing the diagnosis of vertebral fractures prevent to do a therapy to prevent other vertebral fractures and, even more, the hip fracture. This observational study wants to show this hypothesis.

Materials and methods. We have enrolled all women who arrived to our observation with an hip fracture by fragility, to have a rehabilitation treatment. We have booked the age, the BMD and the pharmacological history. We have done at all patients the xray of dorsal and lumbar spine. The pharmacological history wanted to show the patients who have done one therapy for osteoporosis disease. The xray wanted to show if the patients have had one, ore more, vertebral fracture. At least we have calculated the SDI (Spine deformity index) to demonstrate the severity of fractures. **Results.** We have enrolled 70 patients, main age 79 (lower 56, higher 90). Main of BMD was -2,4 T-score (higher -1, lower -4,3). 13 patients (18%) was taking a drug for the osteoporosis (not responder patients); 57 patients (82%) didn't have any therapy (naïve patients). In the 57 naïve patients 18 patients (32%) without fracture, 38 with fractures (68%); 1 with previous hip fracture. In naïve patients with previous fracture, 16 patients (42%) with one fracture; 16 patients (42%) with 2 fractures; 3 patients 8% with 3 fractures, 2 patients 5% with 4 fractures, 1 patient 3% with 5 fractures. 3 patients (8%) have had SDI zero, 29 patients (76%) with SDI between 1 and 3, 3 patients (8%) with SDI between 3 and 6, 3 patients (8%) with SDI upper 6.

Conclusion. In a lot of cases, the hip fracture isn't the first fracture in the clinical history, about osteoporosis disease, of patients. The vertebral fractures are greater than the hip fractures, about 2/3 more, but we diagnose them about 1/3. This study confirms how they are unknown, even when they are more than one even when their measure, expressed by SDI, is serious and important.

References

- Underdiagnosis of vertebral fractures is a worldwide problem" Delmas PD (J Bone Miner Res 2001;16 s : 139) Cooper et al. *JBMR*, 1992.
- Gehlbach et al. *Osteoporosis Int* 2000; 11: 577-582.
- Genant HK, *Bone Miner Res* 1993; 8: 1137-1148.
- Bartoletti, Reda et al. Studio osservazionale sulle fratture vertebrali in pazienti con fratture del femore da fragilità 2007 Poster SIOMMMS.
- Black et al., *J Bone Miner Res* 1999.
- Melton et al., *Osteoporosis Int* 1999.
- Lindsay et al., *JAMA*, 2001.
- Wasnich RD, *Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism*. 4th edition, 1999.

Understanding the epidemiology of human functioning using graphical models

M. Kalisch^{1,2}, E. Grill^{3,4}, B. Fellinghauer^{1,2}, M.H. Maathuis², U. Mansmann⁵, P. Bühlmann², G. Stucki^{1,4,6}

¹Swiss Paraplegic Research (SPF), Nottwil, Switzerland

²Seminar für Statistik, ETH Zurich, Zurich, Switzerland

³Institute for Health and Rehabilitation Sciences, Ludwig-Maximilians-University, Munich, Germany

⁴ICF Research Branch, WHO FIC CC Germany (DIMDI) at SPF, Nottwil, Switzerland and at IHRS, Ludwig Maximilian University, Munich, Germany

⁵Department of Medical Informatics, Biometry and Epidemiology, Ludwig-Maximilians-University, Munich, Germany

⁶Departments of Health Sciences and Health Policy, University of Lucerne, Lucerne and SPF, Nottwil, Switzerland

Introduction. Patients who undergo post-acute rehabilitation after an acute injury or disease, and patients with a chronic health condition often have considerable limitations in functioning. They are in need of both high level medical and nursing as well as rehabilitation care. Despite its universality, the experience of functioning is unique, depending on the underlying health condition and on individual characteristics. Differences in functioning may arise between the initial and terminal states of a disease, between younger and older patients, and in relation to the environment, e.g. the available resources. Since functioning is so utterly complex, this differential understanding of functioning, also in relation to different health conditions, poses major challenges to scientific understanding and to targeted clinical and public health interventions. The development of the International Classification of Functioning, Disability and Health (ICF) on the one hand and recent statistical developments in the analysis of complex data on the other hand might be combined and open the door to a more comprehensive understanding of human functioning. Based on ICF categories we can build and compare functioning profiles. Also, the underlying associations among ICF categories can be analyzed. Revealing patterns of associations among distinct aspects of functioning, the ICF categories, is important to discover clusters and pathways, and to understand stability and distinctiveness of functioning across health conditions. Additionally, knowing those patterns of functioning and their differences as well as their determinants and consequences can help to identify targets for policy, service provision and specific interventions. The objective of the presentation is to demonstrate new statistical methods, i.e. graphical models, for the study of ICF data for a wide range of research questions. **Materials and methods.** We show several fields of application for graphical models using ICF data: Visualization of the dependence structure of the data set, dimension reduction, and comparison of subpopulations. We apply these findings to compare functioning profiles across countries and health conditions. Moreover, we demonstrate how recent findings in causal inference using graphical models can be used to estimate bounds on causal effects from observational data in the presence of many correlated variables and without knowledge of the underlying causal structure. **Results.** In each field of application, graphical models could be applied and yielded results of high face-validity. **Conclusion.** The epidemiology of functioning sets out to examine distribution, determinants and consequences of functioning. By identifying differential patterns of functioning and by investigating causal associations, rehabilitation interventions tailored to specific needs can be developed. Graphical Models are a flexible tool and lend themselves for a wide range of applications. The methods are particularly suited for studies on functioning involving complex profiles of ICF categories.

Musculoskeletal ultrasonography in physical and rehabilitation medicine: results of the First World-wide Survey Study

Background and purpose. The use of musculoskeletal ultrasonography (MSUS) has gained importance in the recent years, especially after physicians dealing with musculoskeletal medicine have become educated and started performing it. This is true not only for medical doctors but even for veterinary physicians. On the other hand, possibly due to lack of device or pertinent education, we believe that it has still not received sufficient merit in daily practice of Physical and Rehabilitation Medicine (PRM) physicians. Accordingly, the aim of this study was to explore the current status of MSUS in the realm of PRM, and to determine the effects of a one-day MSUS course on the awareness of physiatrists. **Design.** Survey study during ISPRM Congress 2009, Istanbul. **Participants.**

Physiatrists attending the congress (N=276) and the MSUS course (N=30) one day before the congress. **Materials and methods.** Six-hundred questionnaires were distributed throughout the congress to enroll physicians of different interests. In a small group of physicians who attended the one-day MSUS course before the congress, the same survey was initially applied immediately before the course. A repeat survey was applied at the end of the day. **Main Outcome Measures.** The survey contained 17 multiple-choice and open-ended questions concerning personal background, perceptions regarding MSUS and current utilization of MSUS. **Results.** Data of 306 physiatrists (with a mean experience of 10.5±8.1 years in the field of PMR) were evaluated. Among the participants, 57.8% were using MSUS in their diagnostic algorithms; the most common indications being shoulder problems (59.8%), muscle injuries (22.1%), knee problems (13.4%), ankle/foot problems (7.8%), arthritis (6.2%), hip pathologies (3.1%) and guidance for local injections (2.3%). 90.4% were thinking that physiatrists should perform sonography themselves and 75.1% declared that he/she would perform sonography if he/she had a device. Those physiatrists who were performing MSUS themselves, reported a mean frequency of 3.2 times/week. The education of the subjects concerning MSUS were as follows; 1-2 day course(s) (47.1%), several 1-2 day courses (25.2%), at least one month (16.8%), 3-4 months (5.9%) and >4 months (5.0%). The ratio of subjects who rated MSUS to be essential for their clinical practice increased from 35.7% to 58.6% after the MSUS course (p>0.05). **Conclusion.** Physiatrists strongly believe that they should perform MSUS themselves, lack of education/device seem to be important issues to be addressed, and even a one-day course significantly changes the awareness on MSUS.

The taking charge of the disabled injured workers: ICF as an assessment instrument of needs and abilities

V. Gallo, G. Ali, V. Castaldo, A. Feragnoli, M. Gabrielli, F. Luisi, M.R. Matarrese, D. Nicita, P. Scelfo, M. Comelli
INAIL's ICF Study Group

The injured workers with severe disability have peculiar characteristics related to the age, the comorbidity and the stationariness of the disability ; they may have peculiar requirements in the process of taking charge by INAIL (Italian Workers Compensation Authority). ICF allows to show the disabled's requirements through the survey of their performance and capacity and the analysis of facilitators and barriers. In this study was examined a sample of 100 patients with limbs amputation and trauma of spinal cord ; the results were collected in a database and processed in VisualBasic with the collaboration of statistical advisors. Through the ICF analysis the authors identified the personalized technical devices as an important answer to the clinical and social requirements of the disabled injured workers. The study of the cases allowed the effectiveness of personalized devices for the working and social reintegration (some case report will be shown in the oral presentation) and the need to implement the ICF for a better analysis of performances and capacities about the working gesture and the available facilitators .

References

OMS. Classificazione internazionale del Funzionamento, della Disabilità e della Salute (ICF), Erickson, Trento, 2004;
 Dario Ianes, La diagnosi funzionale secondo l'ICF. Il modello OMS, le aree e gli strumenti, Erickson Trento, 2004;
 Progetto "Azioni Integrate in ambito riabilitativo secondo la classificazione ICF" Cod. PA 2006/0242/Rer; approvato dalla Regione Emilia Romagna con delibera regionale n. 1156 del 5/08/07 e cofinanziato dal FSE e dal Ministero del Lavoro;
 Davalli A, Sacchetti R, Bonivento C. Protesi mioelettriche: nuovi prototipi. Documento INAIL. Centro Protesi. Sito: www.inail.it/medicinaeriabilitazione.
 Sacchetti R. Nuova generazione di protesi mioelettriche. Sito Internet: www.inail.it/medicinaeriabilitazione/protesi/
 Verni G. Protesi di arto inferiore e superiore. Sito: www.inail.it/medicinaeriabilitazione/protesi
 Davalli A, Sacchetti R. Protesi per arto superiore. Documento INAIL – Centro Protesi. Sito: www.inail.it/medicinaeriabilitazione/
 Gabrielli M, Giardini G, Bazzini G, Morteo F. Modello organizzativo di intervento preventivo-riabilitativo-ergonomico tra INAIL e Fondazione Maugeri. Congresso Internazionale "L'Europa delle riabilitazioni" Roma, ottobre 1999. Pubblicato sugli Atti.
 A. Feragnoli, M. Gabrielli, F. Luisi "Studio sull'utilizzazione dell'ICF nella valutazione della disabilità da lavoro", printed in "Atti VII Convegno nazionale di medicina legale previdenziale" 2008.
 A. Giustini. "LA classificazione ICF nello sviluppo della riabilitazione e del reinserimento lavorativo delle persone con disabilità", printed in "Atti VII Convegno nazionale di medicina legale previdenziale" 2008.
 G. Ali "The model of taking charge of the disabled injured worker at the INAIL Customer Point – Protheses Center in Milan , Italy", printed in "International Forum on disability management 2008".

Epidemiological comparative study of the hemispheric stroke between Kunming (China) and Limoges (France)

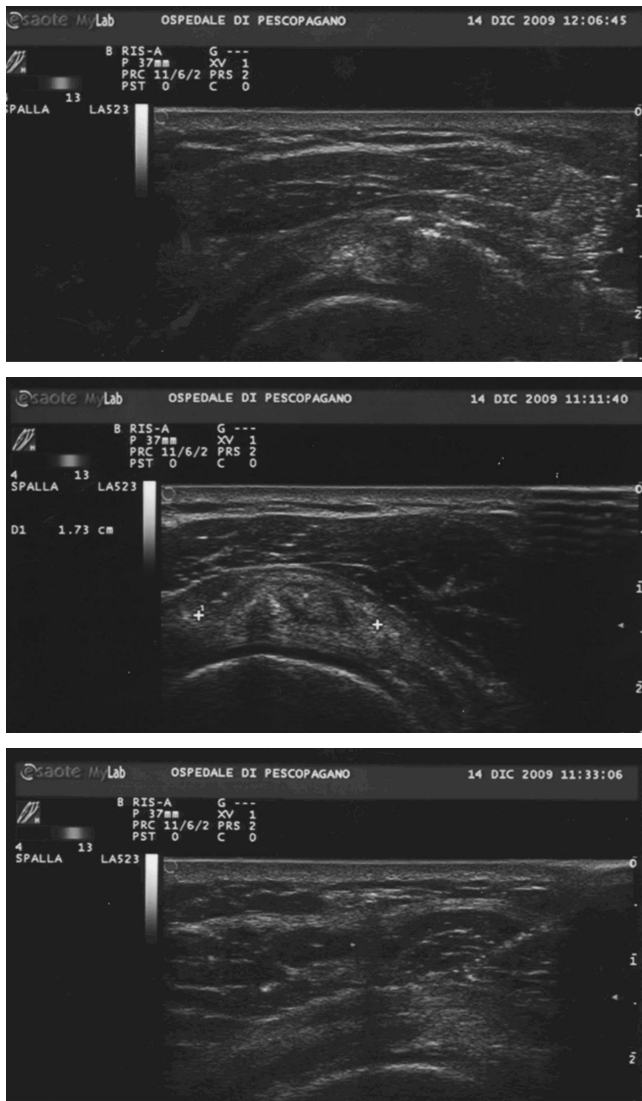
Zhou Zhou^{1,2}, J.C. Daviet², J.Y. Salle², B. Marin³
¹Department of Neurology, No.2 Hospital of Kunming Medical University, Kunming, China
²Department of Physical medicine and rehabilitation, University Hospital Center, Limoges, France
³EA3174, Faculty of medecine, University of Limoges, France

Objective. Clinical outcomes and socioeconomic consequences after a stroke may differ between regions. The aim of the present study was to compare vital and functional outcomes between two stroke cohorts with consideration of epidemiological particularities. **Materials and methods.** two cohorts were established according to the same methodology. One in Kunming (China) and the other in Limoges (France). During 1 year, patients hospitalized within 48 hours for a first-ever hemispheric stroke were included. Demographic data and neuro-cardiovascular risk factors were recorded. Hemiplegia was evaluated with validated scales. Functional outcome was assessed using the Barthel Index (BI) after 3 months. **Results.** 118 patients in Kunming and 156 in Limoges were included. Patients of Kunming were younger (61.4±13.4 vs. 72.3±14.6 years in Limoges, P<0.0001), with a higher proportion in professional activity (36.4% vs. 12.8%, P<0.0001). Survival analysis indicated that mortality did not differed between the two cohorts, but independently predicted by coma at the 2nd day (HR=9.33, 95%CI 4.39, 19.78) and age>70 years (HR=6.29, 95%CI 2.36, 16.59)). Despite a better baseline BI for patients of Kunming (50.0±34.9 vs. 37.4±34.2 in Limoges, p=0.0031), after adjustment for confounding, patients in Limoges had a 2.11 OR 95%CI 1.03, 4.31) to reach a BI > 80 at 3 months. **Conclusion.** functional recovery for patients of Kunming was not as good as expected. The socioeconomic consequences of stroke in Kunming are significant as they involved younger subjects who were still in work.

Ultrasound guided interventional procedures: the percutaneous treatment of calcifying tendinitis of rotator cuff tendons

L. Di Lorenzo¹, A.M. Forte², C. Foti³
¹Dottorando PTV Roma, Rehabilitation Unit RUMMO Hospital Benevento, Italy
²Pescopagano Rehabilitation Unit, San Carlo Hospital, Potenza, Italy
³Rehabilitation Clinic, University of Tor Vergata, PTV, Rome, Italy

Introduction. Description of work target and purposes. Calcific tendinitis is a common painful condition of the shoulder due to deposition of hydroxyapatite crystals. The deposition is most often at the insertion of the supraspinatus tendon on the greater tuberosity , but also occurs in relation to the other tendons of the rotator cuff. There is general agreement that calcific tendinitis should initially be treated nonoperatively and excision reserved for cases unresponsive to conservative treatment. Of the many proposed medical treatments, systemic or local steroid injections and physical treatments are most often used. None of these methods has produced uniformly acceptable results. Percutaneous needle extraction has been used with good results in 60–70% of patients when procedures have been performed under fluoroscopic control. Ultrasonography has been shown to detect and localize rotator cuff calcifications reliably. Under US-guided treatment, the technique of the method "US guidance" had been already well described. Furthermore, a now-days dated interesting report was the first document in 1996 the results obtained with this technique. Results that are then confirmed by anecdotal experiences and several worldwide trials by different authors. In this our paper submitted for Review Communication we aim to report the results of our first US-guided treatments of painful calcific tendinitis of the rotator cuff resistant to conservative therapy in order to report and explain the "easy-to-perform" methodology to Congress auditorium and discuss with it in Venice Congress the clinical based evidence reported in literature by published papers and Evidence Based notes. **Materials and methods.** the so-called "aspiration irrigation technique" is now worldwide performed – as we also use to do – following the two-needles procedure. Under ultrasound guidance, an amount of local anesthetic (usually lidocaine 2%) is injected within the subacromial bursa by a first needle 16/18G 40mm. The needle path is toward the rotator cuff calcification (see pictures) to be treated. A second 18G 40 mm needle is inserted within the calcification. One out of 2 needles is alternatively used to go through within the calcification and usually we use a needle-



guide inside one of the 2 so to try to break the calcification together with an additional rotational movement. Afterward, we do an injection of saline water and local anesthetic through one of the 2 needles and perform aspiration by the other one in an effort to remove calcified material. At the end of these procedures, 1 ml/40 mg of depo-medrol is injected into the subacromial bursa to treat painful inflammation. At the end of procedure residual calcific deposits remain within the tendons and are expected to be reabsorbed in 6 months. Ice bag, NSAIDs (usually indometacin 25 mg tabs bid) levofloxacin 500 mg once a day for a week and Laser HILT therapy is performed. **Results.** In the plenary session we eventually (if work accepted) a rich iconography and methodology performed and worldwide accepted together with one of our cases, of which we add 3 extra still pictures of a recent PTA procedure performed on 14 December 2009 in which we see the calcification of 17mm (picture 1), the needle path toward the calcification (picture 2) and the ending of procedure by subacromial filling. **Conclusion:** US offers precise guidance for needle placement into the calcification without radiation exposure.

The most of authors reported results to be favorable in over 70% of cases and 1 year follow-up shows that they are also maintained. Best results are obtained when the calcification has a faint or absent acoustic shadow and the deposit is more than 1 cm in diameter

References:

:Pekka U. Farin et al. Rotator cuff calcifications: treatment with ultrasound-guided percutaneous needle aspiration and lavage. *Skeletal Radiol* (1996) 25:551-554 © International Skeletal Society 1996.
 Ulthoff HK, Sarkar K, Maynard JA. Calcifying tendinitis. A new concept of its pathogenesis. *Clin Orthop* 1976; 118: 164-168.
 Bianchi & Zamorani. US-guided Interventional Procedures. Chapter 18, paragraph 2.1.4 in *Ultrasound of musculoskeletal system*. Bianchi e Martinoli, 2008. Springer Ed.

Combination intrathecal therapy for simultaneous management of intractable pain and spasticity

???

Introduction. Intrathecal therapy has separate indications for pain and spasticity. Intrathecal baclofen (ITB) is a well recognized technique for patients who experience recalcitrant hypertonicity. Since many of the neuropathologic processes that are associated with spasticity can also be associated with chronic pain, intrathecal baclofen alone may be insufficient to provide pain relief. Reports of the use of ITB in combination with morphine, bupivacaine, clonidine, ziconotide or clonidine and morphine have suggested that refractory pain and spasticity can be managed with combination intrathecal therapy. The purpose of this presentation is to summarize the published clinical experiences with combination intrathecal therapy. **Materials and methods.** The medical literature was examined for studies examining the utility of combination intrathecal therapy. The following search terms were cross-referenced in a variety of search engines: intrathecal baclofen, intrathecal morphine, intrathecal hydromorphone, intrathecal bupivacaine and intrathecal ziconotide. **Results.** Seven publications were found that met the search criteria. No prospective, randomized or placebo-controlled trials were described. All studies were either case reports or case series. Three publications described combination morphine and baclofen use. Single publications reviewed combination therapy with baclofen-bupivacaine, baclofen-clonidine, baclofen-ziconotide and baclofen-morphine-clonidine. The largest clinical experience was with baclofen-morphine combination therapy. Spinal cord injury and multiple sclerosis were the most commonly reported diagnoses. Pain relief varied considerably among the various reports with average decrements of pain intensity from 35% to 90% being reported. Combination therapy was generally well tolerated in the study populations without reports of serious adverse events. **Conclusion.** Combination intrathecal therapy offers a unique treatment strategy for simultaneous management of intractable pain and spasticity. Utilization of this approach can be effective for individuals who experience these two symptoms as the result of central nervous systems pathology. Further investigations, especially prospective and placebo-controlled studies, are warranted to further characterize the potential benefits of this therapeutic approach. One difficulty in studies involving combination intrathecal therapy is the need to perform a pump refill for each dosing adjustment. The development of a dual chambered pump with independent dosing capacity for each agent could potentially advance this type of undertaking.

Interrater reliability of Functional Independence Measure aggregate scores and subscores in a clinical setting

F. Kohler, H. Redmond, H. Dickson
 ???

Background and purpose. The Functional Independence Measure (FIM) has been used in classification and funding systems for rehabilitation patients for about 15 years. There are a number of studies published in the early 1990s which have reviewed its reliability. There has been little published regarding the reliability of the FIM in the clinical setting. The aim of this paper is to report the inter-rater reliability of FIM total score, FIM motor sub-score and FIM cognitive sub-score in the clinical setting. **Design.** A three phase inter-rater reliability cohort study of an ADL scale, the FIM, across two rehabilitation units. In the first phase the raters were unaware that the review would be carried out. In the second phase the raters were aware that the review would be carried out and in the third phase all the raters were aware and credentialed in the use of the FIM. The study is set in two inpatient rehabilitation units immediately adjacent to each other. **Participants.** 143 patients who were transferred between the two rehabilitation units between August 2006 and October 2007 were included in phase 1 of the study. 76 patients who transferred between November 2007 to June 2008 were included in phase 2 of the study. 82 patients who were transferred between July 2008 and June 2009 were included in phase 3 of the study. **Methods/Main Outcome Measure(s).** Discharge FIMs on all patients were scored by the first unit and an admission FIM was scored independently by the second unit within a few days. The FIM total scores, Fim motor subscore and FIM cognitive subscore were analysed for agreement and systematic bias using SPSSv17 and MedCalc. The results were compared using Intraclass correlation coefficients, Kappa statistic, weighted Kappa statistic and Bland Altman Plots. **Results.** In phase one, there were con-

siderable differences between the two FIM totals (-32 to +50), FIM motor subscores (-22 to 43), and FIM cognitive subscores (-14 to 22). Few FIM totals were perfectly matched. The intra-class correlation coefficients ranged from 0.872 for the FIM total, to 0.830 for the cognitive subscales. Values for Kappa ranged from -0.007 (FIM motor subscore) to 0.123 (FIM cognitive subscore). Values for weighted Kappa ranged from 0.465 (FIM cognitive subscore) to 0.521 (FIM total). In phase two, there were considerable differences between the two FIM totals (-75 to +78), FIM motor subscores (-63 to +65), and FIM cognitive subscores (-21 to +21). Few FIM totals were perfectly matched. The intra-class correlation coefficients ranged from -0.103 for the FIM total, to 0.001 for the cognitive subscales. Values for Kappa ranged from -0.005 (FIM motor subscore) to 0.023 (FIM cognitive subscore). Values for linear weighted Kappa ranged from -0.0645 (FIM motor subscore) to 0.016 (FIM cognitive subscore). In phase three, there were considerable differences between the two FIM totals (-33 to +30), FIM motor subscores (-30 to +23), and FIM cognitive subscores (-9 to +19). Few FIM totals were perfectly matched. The intra-class correlation coefficients ranged from 0.570 for the cognitive subscales to 0.686 for the FIM total. Values for Kappa ranged from -0.002 (FIM motor subscore) to 0.122 (FIM cognitive subscore). Values for linear weighted Kappa ranged from 0.377 (FIM motor subscore) to 0.456 (FIM total).

Conclusion. There was no systematic scoring bias evident. There was some variance between the three phases of the study but no obvious significant differences. Intra-class correlation coefficients were moderate to high, but tests of agreement demonstrated poor agreement. Interestingly the fully trained and credentialed FIM raters did not demonstrate better interrater agreement than the other groups. These findings have implications for the use of the FIM, as there were poor levels of agreement in the presence of adequate training and standardization of methods of assessment. Patient classification and funding systems based on FIM scores with any potentially inherent difficulties and inaccuracies would reflect these difficulties and inaccuracies in classification. This study indicates that further investigation of agreement of both FIM totals and FIM item scores in the clinical setting is warranted and that caution needs to be exercised when utilizing FIM in Casemix classifications and benchmarking.

Health awareness in disabled persons – a multicenter survey on lower limb amputees

P. Tederko^{1,2}, I. Kordowicz², M. Fronczek³, K. Gworys³, J. Kujawa^{3,4}, E. Źuczak⁵, K. Szulkowska³, K. Wasiak², D. Wosiakowska⁶, M. Krasuski^{1,2}

¹Medical University of Warsaw, Department of Rehabilitation

²Marian Weiss Rehabilitation Center, Konstancin

³Medical University of Lodz, Department of Rehabilitation

⁴Doctor Z. Radlinski Regional Centre of Orthopedics and Rehabilitation, Lodz

⁵Department of Biomechanics and Prosthetic-Orthopaedic Supply, Medical University in Lodz

⁶Regional Clinic of the Orthopaedic Supply, Lodz

Introduction. Health education is one of fundamental interventions of comprehensive rehabilitation. Optimal level of health awareness (HA) in disabled persons reduces the risk of consequences of disability and health derangement. The purpose of the study is to investigate HA of persons after lower limb amputation (LLA) and to identify predictors of better HA. **Materials and methods.** 161 patients (132 males, 29 females) aged from 16 to 84 (mean 56,2) years recruited in 5 rehabilitation centers between 3 and 780 (mean 69,8) months after LLA. The group consisted of 105 subjects after vascular LLA, 41 with LLA resulting from trauma, 9 who underwent LLA during oncologic treatment, and 6 with LLA because of congenital deformity. Inclusion criteria: at least 3 months elapsing from LLA, reference to rehabilitation in outpatient or inpatient setting. HA was measured by the original tool designed to assess participant's knowledge of symptoms, signs, causes, results and basic treatment methods of typical stump problems. The test consisted of 67 detailed questions concerning the following topics: vascular and inflammatory complications (31 questions), contractures (12), pain disorders (12), skin lesions (9), nursing techniques (3) and open question inquiring of most important sources of health-related knowledge. Statistical analysis was based upon Shapiro-Wilk test, χ^2 -square test, Mann-Whitney test, Kruskal-Wallis test and tools of simple regression. **Results.** Significantly higher HA scores were noted in the following groups of respondents: with traumatic LLA ($p=0,0003$); those who apply a prosthesis ($p=0$), able to drive a car ($p=0,001$), inhabitants of a city larger than 100.000 ($p=0,05$), with education completed on university or secondary level ($p=0,04$), employed ($p=0,0002$), married ($p=0,0001$), those who never smoked ($p=0,003$), with LLA more than

12 months prior to study entry ($p=0,02$). There were no correlations between HA and gender, level of LLA, monthly income, results in Beck inventory, and rate of revision surgery. 49% of participants pointed out hospital health-care professionals as an important source of health-related knowledge, whereas environmental health care was noted by 13%. 51% of respondents assessed their HA as satisfactory. **Conclusion.** Predictors of better HA include: more than 12 months elapsing from LLA, traumatic LLA, application of a prosthesis, driving abilities, habitation in a big city, at least secondary education, employment, marital status. Low HA among inhabitants of villages and small cities may result from a secondary disability related to lack of perspectives on individual development, and inadequate access to rehabilitation. A contribution of environmental health care in spreading of adequate HA among persons after LLA is insufficient.

References

- Demet K, Martinet N, Guillemin F, Paysant J, Andre JM. Health related quality of life and related factors in 539 persons with amputation of upper and lower limb. *Disabil Rehabil* 2003;25(9):480-6.
- Horgan O, MacLachlan M. Psychosocial adjustment to lower-limb amputation: a review. *Disabil Rehabil* 2004;26(14-15):837-50.
- Nehler MR, Coll JR, Hiatt WR, Regensteiner JG, Schnickel GT, Klenke WA, Strecker PK, Anderson MW, Jones DN, Whitehill TA, Moskowitz S, Krupsky WC. Functional outcome in a contemporary series of major lower extremity amputations. *J Vasc Surg* 2003;38(1):7-14.

Health awareness in disabled persons – a preliminary survey on persons after spinal cord injury

P. Tederko^{1,2}, H. Limanowska, M. Krasuski^{1,2}

¹Medical University of Warsaw, Department of Rehabilitation

²Marian Weiss Rehabilitation Center, Konstancin

Sufficient awareness of medical consequences of disability is crucial for safe rehabilitation in environmental setting, prophylaxis of typical complications and rational social participation. The problem of health awareness (HA) of persons after spinal cord injury (SCI) rarely is subjected to scientific analyses. The purpose of the study is to evaluate HA in persons after SCI living in environment and to identify predictors of better HA. **Materials and methods.** 133 persons (99 males, 34 females) aged between 17 and 69 years who suffered from SCI 0,5 to 31 years prior to study entry. Inclusion criteria: at least 6 months elapsing from SCI, accomplished in-patient phase of rehabilitation. At the time of the study 57,9% of participants were living with family, 40,6% living alone and 1,6% in a nursing home. Education level: 7,5% – elementary; 29,3% – vocational; 42,8% – secondary; 20,3% – university. 41,3% of participants were employed. 15,8% reported at least elementary walking abilities. Beck inventory results: 0-11 points – 69,1%, 12-18 points – 15%, 19-26 points – 11,3%, 27-49 points – 4,6%. HA was measured by an original tool consisting of 150 points designed to assess participant's knowledge of symptoms, signs, causes, results and basic treatment methods of typical consequences of SCI such as: urologic complications (37), pressure sores (29), sexual issues (25) musculoskeletal consequences (16), respiratory complications (10), digestive problems (10), rehabilitation and nursing techniques (23). Statistical analysis included Shapiro-Wilk test, χ^2 -square test, t-test, Mann-Whitney test, Kruskal-Wallis test and tools of simple regression. The questionnaire was sent by ground mail to 220 persons. The response rate was 60,5%. **Main results.** HA scores of persons with SCI are reversely correlated with age (correlation coefficient $CC=-0,31$; $p=0,0006$), and Beck inventory results ($CC=-0,36$; $p=0,0001$). HA scores are significantly higher in employed persons, respondents with at least secondary level of education ($p=0,05$), members of an association of spinal cord injured ($p=0,000001$), subjects unable to walk ($p=0,04$), participants able to drive a car ($p=0,06$). HA scores raise with the time elapsing from injury with distinct increments 1 year and 10 years after event ($p=0,006$). Dependence between habitation and HA scores with the favor of those living in big cities is of marginal significance ($p=0,052$) and requires more detailed analysis. HA does not correlate with gender, marital status, cause of injury and overall independence in activities in daily living (ADL) measured with an original 10-point inventory. Responding an open question inquiring most important source of health related knowledge 33,3% of participants pointed out another disabled person, 32,3% - hospital health professionals. **Discussion.** Low level of HA in persons less than 1 year since injury may be related to lack of motivation to rehabilitation resulting from poor self-acceptance, recognition of the disability as a temporary disorder. This can limit an impact of educational interventions in acute hospital. Scores of Beck inventory gradually decrease with age ($p=0,0004$). Low results in respondents able to walk suggest that information concerning wheelchair-related complications appears

unimportant for persons in whom at least basic walking abilities are preserved. Group of non-walkers able to drive a manual wheelchair has high HA, low depression scores, and high employment and participation rates compared to other participants. Ability to drive a car is linked with better HA scores, longer time elapsing from SCI, lower depression scores, higher employment rate and participation in a spinal cord injury association. Application of simple regression in the studied group revealed no correlation between HA and ADL independence ($CC = 0,07$; $p > 0,05$). Results obtained in non-walkers showed a weak relation between these values ($CC = 0,2$; $p = 0,02$). ADL independence is significantly correlated to Beck inventory results ($CC = 0,36$; $p = 0$). Educational programs addressed to SCI persons living in a society are organized by non-government associations. Presentations and counseling usually are provided by non-professional disabled trainers basing on their own experience. More than 81,2% of subjects participating in associations perceive another disabled persons as important source of health related knowledge. These figures should be considered in attempt to design educational programs for persons disabled due to SCI. First target group should consist of wheelchair bound association trainers. Despite of uncertain correlation between habitation and HA ($p = 0,052$) our findings suggest influence of settlements on factors affecting HA and educational demands: rate of secondary or university education: village - 50%, small city - 58,1%, big city - 87,5%; Employment rate: village - 20%, small cities - 53,5%, big cities - 55%; Beck inventory: village - 11,1; small city - 9,5; big city - 7,5 points ($p = 0,001$). **Conclusion.** Predictors of better HA in persons after SCI include young age, at least secondary education, more than 10 years elapsing from injury, social participation, employment, walking inability, low scores in Beck inventory. Interaction with other persons with disability is main source of health related knowledge in SCI persons.

References

- Albert T, Ravaud JF, Tetrafigap group. Rehabilitation of spinal cord injury in France: a nationwide multicentre study of incidence and regional disparities. *Spinal Cord* 2005; 43(6): 357-365.
- Dryden DM, Saunders LD, Rowe BH, May LA, Yiannakoulis N, Svenson LW, Schopflocher DP, Voaklander DC. Utilization of health services following spinal cord injury: a 6-year follow-up study. *Spinal Cord*. 2004; 42(9): 513-524.
- Giangregorio L, McCartney N.: Bonne Loss and Muscle Atrophy In Spinal Cord Injury: Epidemiology, Fracture Prediction, and Rehabilitation Strategies. *The Journal of Spinal Cord Med* 2006; 29 (5): 489-500.

Clinical and neurophysiological evaluation of neurogenic lesions and physical therapy of children with spinal dysraphism

I. Petronic¹, D. Cirovic¹, T. Knezevic¹, D. Nikolic¹, D. Dzamic¹, R. Brdar², Mirjana Raicevic²

¹Physical Medicine and Rehabilitation Department, University children's Hospital, Belgrade, Serbia

²Pediatric Surgery Department, University children's Hospital, Belgrade, Serbia

Introduction. Spinal dysraphism is a congenital anomaly that presents as different degree of neurogenic lesion with limbs deformity and dysfunction of intestinal sphincter and urinary bladder. Aim of our study was to evaluate clinical and neurological manifestations in children with spinal dysraphism as well to estimate effectiveness of physical therapy. **Materials and methods.** We evaluated 160 children with diagnosed spinal dysraphism during 2007-2009 at University children's Hospital in Belgrade. Two entities were analyzed: occult spinal dysraphism and open spinal dysraphism. Further clinical parameters were evaluated: paralysis, paresis, incontinence, enuresis and/or encopresis and limb deformities. To assess neurogenic lesion we used electromyography and evoked potentials. Physical therapy was implemented in all children with orthoses in those with limb deformities. After treatment all children were separately assessed. **Results.** We have found that paresis was predominant neurogenic lesion in patients with occult spinal dysraphism, while paralysis was predominant in those with open lesion. We found non significant difference in distribution of incontinence and enuresis and/or encopresis between two entities as well for foot deformities but in different degree due to the degree of neurogenic lesion. Physical therapy showed significant improvement in motion range of the affected limbs ankles with muscle strength preservation. Further, we also found significant improvement in both entities regarding restoration of miction function and defecation. **Conclusion.** Strength of this study is that early diagnosed degree of neurogenic lesion in patients with spinal dysraphism with early beginning of physical therapy and continuous monitoring results in maximal functional recovery.

Extracorporeal shock wave therapy application to 60 patients with diagnosis plantar phascitis and calcaneal spur

N. Korchazhkina, A. Rubamchenko

Burnasyan Federal Medical Biophysical Center of the Federal Medical Biological Agency, Russia, Moscow

Background and objectives. The article presents results of extracorporeal shock wave therapy application to 60 patients with diagnosis plantar phascitis and calcaneal spur. **Participants.** 60 patients with diagnosis plantar phascitis and calcaneal spur. **Methods and results.** The comparing analysis has shown that more then a half of the main group noticed the pain syndrome decrease up to 3-4 points, after the treatment course pain syndrome of 90% of patients decreased to 1-2 points, which was not observed in the control group, where even after the treatment course pain intensity was not less then 7-8 points. The study results were confirmed by a radiologic investigation.

Gait robot for the repetitive practice of floor walking and stair ascending and descending in non-ambulatory patients

A. Waldner, C. Werner, C. Tomelleri, S. Hesse

Background. Stair climbing up and down is an essential part of everyday's mobility. To enable wheelchair-dependent patients the repetitive practice of this task, a novel gait robot, G-EO (EO, Lat: I walk), based on the end-effector principle has been designed. The trajectories of the foot plates are freely programmable and the movement of the centre of mass is controlled. The article presents the design, compares the lower limb muscle activation pattern of hemiparetic subjects during the real and simulated walking condition, and reports a single case. **Materials and methods.** The muscle activation pattern of eight lower limb muscles of six hemiparetic patients during free and simulated walking on the floor and stair climbing was measured via dynamic electromyography. Eleven non-ambulatory, sub-acute stroke patient additionally trained on the machine every workday for five weeks. **Results.** During floor walking, the onset (duration) of the thigh muscle activation was delayed (prolonged) on the machine across all subjects. During stair climbing, the shank muscle activation was more phasic and timely correct in selected patients on the device. The severely affected subjects regained walking and stair climbing ability. **Conclusion.** The G-EO is an interesting new option in gait rehabilitation after stroke. The lower limb muscle activation patterns are comparable, and the positive case report warrants further clinical studies.

References

- Kolominisky-Rabas PL, Heuschmann PU. Incidence, etiology and long-term prognosis of stroke. *Fortschr Neurol Psychiatr* 2002; 70: 657-662.
- Jorgensen HS, Nakayama H, Raaschou HO, Olsen TS. Recovery of walking function in stroke patients: the Copenhagen stroke study. *Arch Phys Med Rehabil* 1995; 76: 27-32.
- Hesse S, Bertelt C, Jahnke MT, Schaffrin A, Baake P, Malezic M, Mauritz KH. Treadmill training with partial body weight support as compared to physiotherapy in non-ambulatory hemiparetic patients. *Stroke* 1995; 26: 976-981.
- Colombo G, Joerg M, Schreier R, Dietz V. Treadmill training of paraplegic patients using a robotic orthosis. *J Rehabil Res Dev*. 2000; 37(6): 693-700.
- Hesse S, Uhlenbrock D. A mechanized gait trainer for restoration of gait. *J Rehab Res Dev*. 2000; 37(6): 701-708.
- Freivogel S, Mehrholz J, Husak-Sotomayor T, Schmalohr D. Gait training with the newly developed 'LokoHelp'-system is feasible for non-ambulatory patients after stroke, spinal cord and brain injury. A feasibility study. *Brain Inj*. 2008 Jul; 22(7-8): 625-632.
- Schmidt H, Sorowka D, Hesse S, Bernhardt R. Development of a robotic walking simulator for gait rehabilitation. *Biomed Tech (Berl)*. 2003 Oct; 48(10): 281-286.
- Taub E, Miller NE, Novak TA, Cook EW, Fleming WC, Nepomuceno CS, Connell JS, Crago JE. Technique to improve chronic motor deficit after stroke. *Arch Phys Med Rehabil*. 1993; 74: 347-354.
- Pohl M, Werner C, Holzgraefe M, et al. Repetitive locomotor training and physiotherapy improve walking and basic activities of daily living after stroke: a single-blind, randomized multicentre trial (DEutsche GAngrainerStudie, DEGAS). *Clin Rehabil*. 2007 Jan; 21(1): 17-27.
- Mehrholz J, Werner C, Kugler J, Pohl M. Electromechanical-assisted training for walking after stroke. *Cochrane Database Syst Rev*. 2007 Oct 17; (4): CD006185.
- Hussein S, Schmidt H, Volkmar M, et al. Muscle coordination in healthy subjects during floor walking and stair climbing in robot assisted gait training.
- Westlake KP, Patten C. Pilot study of Lokomat versus manual-assisted treadmill training for locomotor recovery post-stroke. *J NeurEng Rehabil* 2009, 6-18

Hidler J, Nichols D, Pelliccio M, Brady K, Campbell DD, Kahn JH, Hornby G. Multicenter Randomized Clinical Trial Evaluating the Effectiveness of the Lokomat in Subacute Stroke. *Neurorehabil Neural Repair* 2009; 23; 5-13.
 Hesse S, Welz A, Assmann E, Quentin B, Waldner A. Pedestrians in Berlin after stroke. Recommendations for street and subway transit. *Nervenarzt*. 2009 Aug;80(8):953-8.

Interest of a multidisciplinary consultation of diabetic foot

J. Hamonet¹, C. Verdié-Kessler¹, J.-C. Daviet^{1,2}, E. Denes³, C-L NGuyen-Hoang¹, J-Y. Salle^{1,2}, M. Munoz¹

¹CHU Limoges, Hôpital J Rebeyrol, Pôle médecines aiguës spécialisées, Service de médecine physique et de réadaptation, Limoges, France

²Univ Limoges, Faculté de Médecine, EA 3174, Limoges, France

³CHU Limoges, Hôpital Dupuytren, Pôle médecines aiguës spécialisées, Service de maladies infectieuses, Limoges, France

Objectives. To evaluate the effectiveness of a multidisciplinary consultation of foot with ulcer risk in terms of healing the injury for curative treatment and lack of podologic complications for preventive treatment. **Materials and methods.** Retrospective study conducted on 136 patients seen in consultation between the 1st January 2005 and the 31th December 2006. Follow-up of 18 to 42 months. **Results.** 39,7% of diabetic patients were addressed in primary prevention, 53,8% for a foot ulcer, and 5,1% in secondary prevention. The global healing rate was 76,19%. Healing was achieved in 63,6% of cases with off-loading shoe versus 81,8% of cases with total contact casting. The healing rate with osteitis underlying was 55,55%. No major amputation was performed. Primary prevention was effective in 100% of cases. **Conclusion.** Care and follow-up of diabetic foot in multidisciplinary consultation seem effective not only in curative treatment, but also in primary and secondary prevention. The economic benefits remain to be evaluated.

Physical factors associated with post-stroke fatigue

C.L. Nguyen Hoang¹, F. Macian², J. Hamonet¹, A. Stuit¹, J.Y. Salle¹, J.C. Daviet¹

¹Physical Medicine Ward, J Rebeyrol Hospital, Limoges University Hospital, France

²Neurovascular Unit, Neurologie Ward, Dupuytren Hospital, Limoges University Hospital, France

Backgrounds. Physical post-stroke fatigue is a frequent and disabling symptom, which origin is not determined. The aim of this prospective study was to look for a correlation between post-stroke fatigue and physical factors in patients above 3 months after stroke. **Materials and methods.** We have included 32 patients (mean age 64.6 years), with a mean post-stroke interval of 28 months. Physical fatigue was assessed using the Fatigue Severity Scale (FSS). We assessed correlation between fatigue and age, gender, time since stroke onset, the Motricity Index, the Barthel Index, the New Functional Ambulation Category, the Berg Balance Scale, gait speed on 10 meters walk, 6 minutes walk distance, the Dijon Activity Score, the Montgomery and Asberg Depression Rating Scale, Epworth Scale, pain and posturographic area of center of pressure movements. **Results.** Percentage of patients with a FSS score equal or above 4 was 64.6%. Mean FSS score was 4.3±1.8. We found no correlation between physical post-stroke fatigue and studied physical factors. Post-stroke fatigue was not associated with motor impairment, self-sufficiency, walking abilities, balance, physical activity nor depression. We found a significant association between post-stroke fatigue and pain: 71.4% of patients with post-stroke fatigue described pain, versus 36.4% of patients without post-stroke fatigue (p = 0.04). Correlation between physical fatigue and a longer time since stroke onset was slightly significant (p = 0.05). **Conclusion.** Our study found a significant relation between pain and physical fatigue after stroke. An appropriate management of pain is probably needed to diminish physical fatigue after stroke. Further studies are necessary to determine causes of physical fatigue after stroke.

The prevention of the hip ri-fracture: suggest of a correct therapeutic pathway

M.G. Bartoletti¹, A. Reda²

¹Centro di Riabilitazione "Biolife", Cosenza

²U.O. Fkt Distretto Sanitario Rogliano, ASP, Cosenza

Introduction. The osteoporosis is a prevalent disease characterized by bone fragility and increased fracture risk; the woman are affected by it more than men. The hip fracture is the most dangerous expression of the osteoporosis disease, because it provokes death (30% during the first year) or reduction of ADL. One of the most important problem is the hip ri-fracture. We esteem that in Italy about the 25%, in survival patients one year after the first fracture, will suffer the second hip fracture. This problem is due at the absence of the correct pharmacological therapy and the absence of the correct rehabilitation therapy. We want to suggest, with this study, the correct therapeutic pathway after the first hip fracture. **Materials and methods.** Usually, after orthopaedic ward, the patient goes or own home, or home of relatives, or to rehabilitation ward or to RSA. If the patient goes own or home of relatives or to RSA, he will done an inadequate rehabilitation. The correct pathway is to go to in a hospital of rehabilitation, where he has to stay about three weeks to stabilize his general situation. After this time, the patient has to go in extra-hospital ward of rehabilitation, where he has to stay 4-5 weeks to improve his ability. If the patient can walk, even with the crutches, and he has a good familiar support, he has to go to rehabilitation surgery, where he can improve, even more, his ability. If the patient walks bad and he has a good familiar support, he has to go own or home of relatives, where he continues the rehabilitation therapy. If he will walk well, after a right time, he has to go to rehabilitation surgery, where he can improve even more his ability. If the patient walks bad and he hasn't a good familiar support, he has to go to RSA.

References

L'osteoporosi in Italia – Dimensione del fenomeno, conseguenze e modalità di gestione da una somministrazione giornaliera ad una annuale; The European House-Ambrosetti; Il Sole 24 Ore Sanità, 19 febbraio 2007.
 "Underdiagnosis of vertebral fractures is a worldwide problem" Delmas PD (J Bone Miner Res 2001,16 s : 139).
 Cooper et al. JBMR,1992.
 Gehlbach et al. Osteoporosis Int 2000; 11: 577-582.
 Genant HK, Bone Miner Res 1993; 8: 1137-1148.
 Bartoletti,Reda e al. Studio osservazionale sulle fratture vertebrali in pazienti con fratture del femore da fragilità 2007 Poster SIOMMMMS.
 Black et al., J Bone Miner Res 1999.
 Melton et al, Osteoporosis Int 1999.
 Lindsay et al., JAMA, 2001.
 Wasnich RD, Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism. 4th edition, 1999.

Sacral nerve modulation in the treatment of bladder symptoms due to multiple sclerosis

E. Andretta¹, E. Ostardo², L. Limido³, C. Campo³, C. Simeone⁴, D. Signorello⁵, M. Pastorello⁶

¹U.O. Urologia, Ospedale Civile Dolo (VE)

²U.O. Urologia, Ospedale S. Maria degli Angeli, Pordenone

³Medtronic, Italia

⁴U.O. Urologia, Ospedale Civile Brescia

⁵U.O. Urologia, Ospedale Civile Bolzano

⁶U.O. Urologia, Ospedale di Negrar (VR)

Introduction. Sacral nerve modulation (SNM) has been used in some cases of neurogenic bladder caused by multiple sclerosis (MS) but the few references available usually regard a small number of patients (pts) or with a short follow-up (1, 2). We reviewed data of MS pts treated with SNM in order to evaluate the effectiveness of the therapy. **Materials and methods.** In July 2008 this survey was proposed to all the centres in North-East of Italy. Only 3 centres have been performing SNM in MS pts and a questionnaire has been filled for each included subject. The questionnaire enquired about demographic data, MS features, perceived changes in micturition symptoms and changes coming from micturition-diaries. A visual analogic scale was used to assess the improvement of the Quality of Life (QoL) and the symptom urgency. **Results.** Sixteen pts (12 females and 4 males, mean age 50 ± 11 years) were analysed. MS was mainly the intermittent-remittent type (56%) and had been lasting for 4 to 40 years (mean 13 ± 10) before implant. Indications to SNM were voiding symptoms (VOID) in 4 pts (25%), storage symptoms (STOR) in 7 (44%) and mixed symptoms (MIX) in 5 cases (31%). Six pts reported simultaneous constipation. Twelve subjects (75%) were paraparetic, and 3 (19%) tetraparetic. The mean follow-up was 45 ± 28 months (range 7-84). The electrical parameters have been individually programmed and the number of reprogrammations ranged from an average of 0.9 in STOR to 2.4 in MIX. In 4/5 cases of MIX the stimulation has been interrupted after a mean time of 66 months (range 24-84) for disease progression in 1 patient and for loss of efficacy in 3.

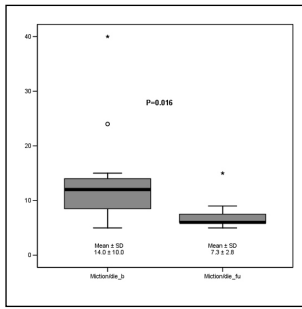


Figure 1. – Number of micturitions/die (from 14.0±10 to 7.3±2.8, p=0.016).

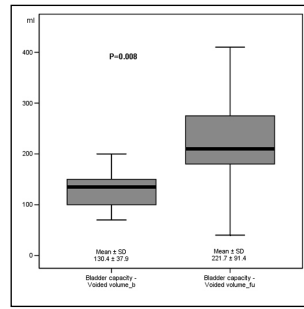


Figure 2. – Voided volumes (ml) (from 130.4±37.9 to 221.7±91.4, p=0.008).

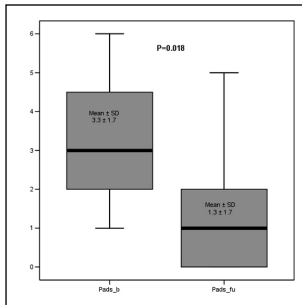


Figure 3. – Number of pads/die (from 3.33±1.66 to 1.33±1.67, p=0.018).

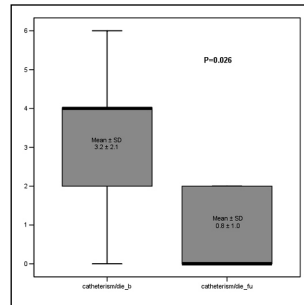


Figure 4. – Number of catheterisations/die (from 3.2±2.1 to 0.8±1.0, p=0.026).

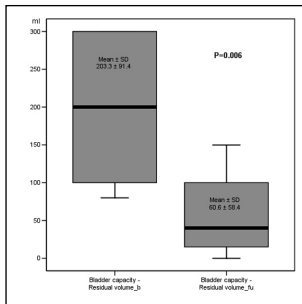


Figure 5. – Residual volumes (ml) (from 203.3±91.4 to 60.6±58.4, p=0.006).

The Expanded Disability Status Scale (EDSS) for all pts doesn't change significantly between the basal evaluation and the last follow-up visit (5.8±1.8 pre-SNM, 6.2±2.1 post-SNM) but pts complaining of MIX presented a quicker progressive MS (from 6.5±0.0 to 8.0±1.0). To the question "After SNM did you detect any significant and lasting change in your bladder symptoms?" totally 80% of pts replied positively (100% of STOR pts, 75% of VOID pts and 50% of MIX pts). Pictures show the changes, all statistically significant, observed between the basal and the last

follow-up evaluation – number of micturitions/die (Fig. 1), voided volumes (Fig. 2), number of pads/die (Fig. 3) and urgency level (Fig. 7) of the STOR and MIX pts; number of catheterisations/die (Fig. 4)

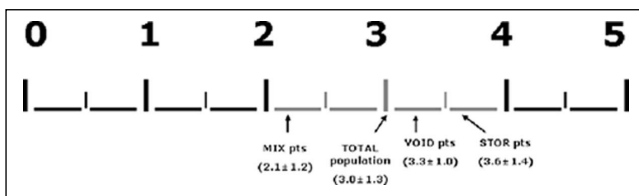


Figure 6. – "How much has changed your quality of life?" The score ranges from 0 (nothing at all) to 5 (very much)

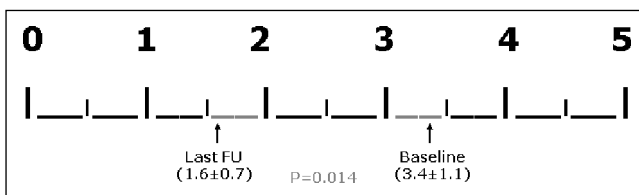


Figure 7. – Urgency level. The score ranges from 0 (no urgency at all) to 5 (severe).

and residual volumes (Fig. 5) of VOID and MIX pts and QoL of all pts (Fig. 6) -. We had also found a relationship between improvement of bladder function and disease status (p= 0.044). **Discussion.** The improvement of bladder symptoms with SNM is significant in MS pts complaining of STOR and VOID and it regards all the items and subsequently the QoL. The best results have been observed in STOR and the worst in MIX, where SNM has obtained the poorer results. It is worthwhile that pts complaining of MIX presented a more aggressive disease and this could explain the decrease of efficacy of SNM with time observed in 4 pts. **Conclusion.** SNM could be a therapeutic option in selected cases of refractory bladder dysfunctions caused by a stable or a slowly progressive MS. Overall we observed objective and subjective improvement both in symptoms and in QoL in STOR and then in VOID. Instead in MIX the results are unsatisfactory and short-lasting; therefore the use of SNM in such symptoms should be avoided.

References

- Wallace P, Lane F, Noblett K. Sacral nerve neuromodulation in patients with underlying neurological disease. *Am J Obstet Gynecol* 2007;197:96e1-96e5.
- Chartier-Kastler E, Bosch J, Perrigot M, Chancellor M, Richard P. Long-term results of sacral nerve stimulation (S3) for the treatment of neurogenic refractory urge-incontinence relates to detrusor hyperreflexia. *J Urol* 2000;164:1476-1480.

Census of the spinal cord injuries in a district of the north-east of italy

E. Andretta¹, F. Laganà¹, C. Zulliani², D. Primon³, S. Buoso⁴, La Colonna, Associazione Lesioni Spinali ONLUS⁵

¹U. O. Urologia, Ospedale Civile Dolo (VE)

²U. O. Neurologia, Ospedale Civile Mirano (VE)

³U. O. di Riabilitazione, Ospedale Civile Camposampiero (PD)

⁴Servizio di Riabilitazione, Ospedale Civile Noale (VE)

⁵Mirano (VE)

Introduction. In Italy the prevalence of spinal cord injury (SCI) is still unknown (1). The aim of our study was to census SCI patients in our district. Hereby we report the data obtained by a questionnaire distributed through the general practitioners (GPs) with particular regards to sphincteric aspects. **Materials and methods.** In 2007/08 all the GPs of the 13 Veneto District were contacted by mail (1-3 times) and when necessary by telephone. They were asked if they had SCI patients, their number and then they were invited to administer to each SCI patient a self-assessment questionnaire consisting of 42 items. The questionnaire enquired about demographic data, features of SCI, bladder and rectal management, sexual aspects, hobbies and sports performed, use of public buildings and the quality of life (QoL). A total of 82 SCI patients (pts) were recruited and 47 (57%) completed the questionnaire. **Results.** In the 47 subjects - 37 males, 10 females, age 18-90 years, average 50 - the SCI occurred at the average age of 33 (min 8 months, max 81 years). The main cause of SCI was a road accident (54%) followed by work accident (11%). 31 patients are paraplegic and 16 tetraplegic; SCI level is cervical in 34%, thoracic in 43% and lombo-sacral in 23%. The injury is complete in 25.5% of cases. Most pts live in family (89%) and 29% are occupied (6% study and 23% work). **BLADDER MANAGEMENT:** 25% of the interviewed people use pads and 35% males need urocondoms. 74% of subjects have undergone at least 1 urological visit per year and 72% of them refer to the urological unit of the district 13, while 15% prefer to refer to a spinal unit. About 11% have never had an urological evaluation carried out since hospital discharge. (Fig. 1) **Rectal management:** 13% of patients report normal defecation and 72% constipation. Fecal incontinence occurs in 6% on a normal basis and occasionally in 36%. (Fig. 2). **Sexuality:** 43 subjects (91%) - 34 males and 9 females - answered: 60% of them have a relationship, 25 pts (58%) have children and children arrived after SCI in 7.56% of males have erections and 23% ejaculate. 2/9 females report vaginal sensibility and 5/9 have an adequate lubrication. **Quality of life (QoL):** Bladder dysfunction is the problem that mostly interferes with QoL for 70% of subjects, followed by neurogenic pain (57%), architectural barriers (47%) and then rectal dysfunction (45%) (Fig. 3). **Discussion and conclusion.** The prevalence of SCI detected is surely underestimated (the population in our district is about 260.000 inhabitants and the prevalence of SCI in Italy is assumed to be of 800/900 cases per 1.000.000 inhabitants): this probably depends on the partial co-operation of GPs and SCI patients. The distribution of causes of SCI presents, as expected, a majority of road accidents in young males. The urinary incontinence is common (detected at least in 25% of the sample) while the fecal incontinence is rare. The majority of the SCI people performs CIC, is used to

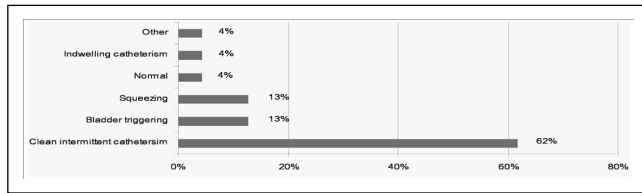


Figure 1. – Bladder management.

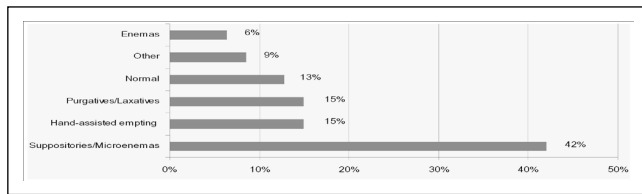


Figure 2. – Rectal management.

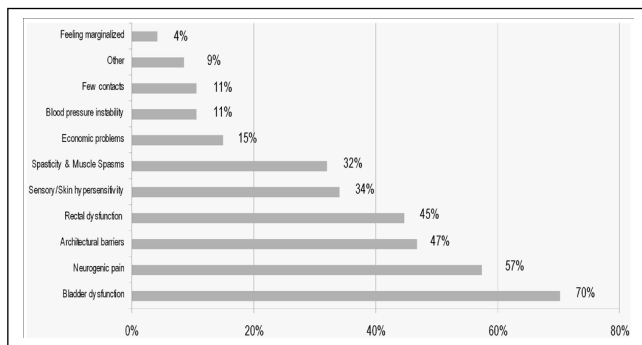


Figure 3. – Problems that mostly interfere with quality of life (with possibility of multiple choice).

undergoing regular urological check-ups, reports constipation and is used to obtain scheduled evacuations by suppositories or microenemas. Sphincteric dysfunctions, and especially the bladder ones, are perceived as the most invalidating aspect of the SCI. These data suggest a high level of information on urological risks and also a mean good compliance to therapies, probably due to the high impact of bladder dysfunctions on QoL and also to the availability in loco of a neuro-urological centre. It is also likely that this survey had selected especially motivated SCI people. This preventive behaviour is more significant when consider that urological problems are the most frequent complications reported in literature (2).

References

1. M. C. Pagliacci, M. G. Celani, M. Zampolini, L.Spizzichino, M. Franceschini, S.Baratta, G. Finali, G. Gatta, L. Perdon, for the Gruppo Italiano Studio Epidemiologico Mielolesioni - An Italian Survey of Traumatic Spinal Cord Injury - Arch Phys Med Rehabil Vol 84, September 2003
2. M. C. Pagliacci, M Franceschini, B Di Clemente, M Agosti, L Spizzichino on behalf of GISEM (Gruppo Italiano Studio Epidemiologico Mielolesioni) - A multicentre follow-up of clinical aspects of traumatic spinal cord injury - Spinal Cord (2007) 45, 404–410

Asymmetry of external rotation-abduction-flexion and of internal rotation-adduction-extension of glenohumeral joint

S. Orzes¹, P. Ranaudo², P. Siragna³, S. Prade⁴, F. Rizzo⁵, M. Ambrosone⁶, A. Sergi Rocco⁷, F. Festa⁸

¹U.O. di R.R.F. Feltre. U.L.S.S. N.2 (BL). Prof. a c. c/o Master in Scienze Osteopatiche e Posturologiche. Università degli Studi “G. D’Annunzio”, Chieti-Pescara.

²Verbania. Prof. a c. c/o Master in Scienze Osteopatiche e Posturologiche. Università degli Studi “G. D’Annunzio”, Chieti-Pescara.

³U.O. di R.R.F. Feltre. U.L.S.S. N.2 (BL)

⁴U.O. di R.R.F. Feltre. U.L.S.S. N.2 (BL)

⁵U.O. di R.R.F. Feltre. U.L.S.S. N.2 (BL)

⁶Istituto di Ortopedia e Traumatologia, Milano-Bicocca

⁷Spec. M. Fis. e Riabilitazione. Istituto Soncin ULSS 16 Padova, Poliambulatorio S. Benedetto Scorzè (VE) ULSS 13 Mirano
⁸Professore Ordinario di Ortognatodonzia e Gnatologia, Università degli Studi “G. D’Annunzio”, Chieti-Pescara

In a previous study, evaluating posterior arm crossing in 397 cases, we found that in 250 cases (62.9%) hands linked better towards the right during flexion-abduction-external rotation and towards the left during extension-adduction-internal rotation. Meanwhile, in 21 cases (5.2%), hands linked better in the opposite position; 126 (31.7) were fairly symmetrical. **Aim.** Confirm asymmetry and verify if it depends mainly on asymmetry in flexion-abduction-external rotation or extension-adduction-internal rotation.

Patients and research methods: Individuals from 3-45 years of age. Exclusions: malformations, congenital diseases, etc; significant orthopaedic or neurological diseases, chronic shoulder pain, previous shoulder or cervical-dorsal rachis operations; whiplash, trauma; scoliosis > 10° Cobb; inferior limb length difference> 1 cm. Patients were examined in standing position, undressed, barefoot. They were helped by examiners to bring their hand towards their back along the spine, as much as possible without straining or causing pain, with the humerus in retroclusion-adduction-internal rotation and later in flexion-abduction-external rotation. Maximum limit reached with the tip of the middle finger or the 3rd metatarsus-phalangeal, was marked with a dermatographic pencil. Later the same procedure was repeated with the other arm. Results were reported regarding the side which presented wider range of movement and the spinouses processes between the two movements. Given the significant margin of error, differences in range of movement less than 1.5cm were considered equal. Gender and age were reported and manual and visual dominance were also evaluated. **Results.** 161 cases were examined (98f, 63m) from ages 3 to 45; average age=24.2; average female age=27.7; average male age=20. 46 cases (27f,19m) were more successful with the right hand during flexion-abduction-external rotation; 24 (12f, 12m) with left hand; 91(59f, 32m) were symmetrical (average about 1 spinouse process both right and left). In retroclusion-adduction-internal rotation 98 (67f, 31m) individuals presented range of movement > left (average 1.8 spinouse process), 16 (6f, 10m) > right (average 1.1 spinouse process) and 47 (26f, 21m) were symmetrical. **Considerations and conclusions.** The right arm generally presents more range of movement than the left during flexion-abduction-external rotation. The left more frequently moves in extension-adduction- internal rotation than the right, but the quantitative and qualitative entity of this second parameter is much more significative than the first and confirms our previous research regarding this asymmetry.

We can conclude that the glenohumeral joint, clavicle, thorax, ribs, cervical and dorsal spine, aboveall D4-D6, jaw, skull etc., are structured and function asymmetrically.

Manual treatment of knee osteoarthritis

S. Orzes¹, M. Calasso², G. De Sena³, A. Sergi Rocco⁴

¹U.O. di Medicina Fisica e Riabilitazione U.L.S.S. N.2 Feltre (BL).Prof. a c. c/o Master in Scienze Osteopatiche e Posturologiche. Università degli Studi “G. D’Annunzio”, Chieti-Pescara.

²Già primario di RRF ad Urbino. Specializzato in Ortopedia e Traumatologia. Prof. a c. c/o Master in Scienze Osteopatiche e Posturologiche. Università degli Studi “G. D’Annunzio”, Chieti-Pescara.

³Specialista Terapia Fisica e Riabilitazione, Napoli

⁴Fisiatra Antalgic Mirano e S. Benedetto Scorzè U.L.S. Mirano (VE)

Knee pain, especially the degenerative type, is particularly common in people after their fifties and sixties. There are several and various remedies that claim to relieve knee pain, but not all of them have been scientifically tested. They range from medical therapy to injections (i.e. with hyaluronic acid) to physical therapy, kinesiology, etc. In this study we will talk exclusively about *manual therapy* as, from our experience, it is the quickest, most effective, and “preventative” therapy available so far. Almost always, the gonartrosis is accompanied by a restriction of the articular range of the greater movements (flexion-extension) and the minor movements (adduction, abduction, external and internal rotation, antero-posterior-medial and lateral sliding, compression, decompression etc.). Generally speaking, inducing greater articular freedom is successful in providing significant relief to the patient and in delaying the acceleration of the degenerative processes (the pressure for unit surface diminishes because it is more evenly distributed; the cartilage is more perfused, etc.). It is important to retain the musculature (stret-

ching, toning up, treatment of the trigger points, of contractures, etc.), especially hamstrings, popliteus, adductors (above all gracilis and magnus), quadriceps, tensor fascia lata, sartorius, gastrocnemius, soleus, peroneus (longus, brevis, tertius), tibialis (posterior, anterior), flexors (allucis longus, digitorum longus), extensors (allucis longus, digitorum longus) etc. Moreover, it is essential to examine and treat the near articulations (lumbar spine, sacro-iliac, coxo-femoral, inferior tibiofibular joint, foot etc.). Various structures are analytically examined (patellofemoral joint, tibiofemoral joint, superior and inferior tibiofibular joints, muscles etc.). The dysfunctions that may be encountered and a number of treatment techniques - citing several authors, for every kind of knee articulation are briefly described. A total posturologic treatment is useful, as is segmenting it (plantari, RPG etc.). Manual therapy is particularly recommended in more premature and less serious cases, but it can also be helpful in more advanced stages and should therefore be seriously considered in the treatment of knee osteoarthritis.

Asymmetric rotation of cervical spine evaluated with cervical measurement system (C.M.S.)

S. Orzes¹, G. Dalla Corte², F. Festa³, G. De Sena⁴, E. Viva⁵

¹U.O di Medicina Fisica e Riabilitazione U.L.S.S. N.2-Feltre (Bl)

²U.O di Medicina Fisica e Riabilitazione U.L.S.S. N.2-Feltre (Bl)

³Titolare Cattedra di Ortopodiatria. Università degli Studi "G. D'Annunzio", Chieti

⁴Specialista Terapia Fisica e Riabilitazione, Napoli

⁵Specialista in ORL. Clinica O.R.L. (Verona)

In 2 previous studies on the cervical spine we have found: 1) in seated position, in 311 cases [202 (64.9%) there was greater range of movement of rotation of the neck towards the right; 50 (16%) towards left; 59 (18.9%) were symmetrical] and 2) in lying position, in 501 cases [288 (57.4%) neck rotation was wider towards right; 80 (15.9%) towards left; 133 (26.5%) had symmetrical torsion. 176 (35.1%) subjects complained of more difficulty and pain rotating the neck to the left; 71 (14.1%) rotating right; 254 (50.6%) reported no side differences. **Aim.** To have instrumental confirmation of this asymmetry using the cervical measurement system and evaluating also with hands crossed behind a chair (Kapandji I.A.). **Materials and methods.** age > 3 years old. Seated patients, with body and shoulders relaxed, were helped to rotate their heads to the right and then to the left to **identify the more limited side**. The movement was repeated using the cervical measurement system in this position and also with hands crossed behind chair. Age and gender were reported. **Results.** 142 patients were examined (95f; 47m), between the ages of 3 to 55. The average age was 31.7 (36.5f; 22.1m). With arms free, 71 (50%) (44f; 27m) rotated their necks better to the right; 25 (17.6%) (13f; 12m) to the left; 46 (32.3%) (38f; 8m) presented fairly symmetrical torsion. With hands behind a chair, 75 (52.8%) (46f; 29m) rotated their necks better to the right; 24 (16.9%) (13f; 11m) to the left; 43 (30.2%) (36f; 7m) presented fairly symmetrical torsion. **Conclusion.** This data reveals a "normal because more frequent" asymmetry which the body has induced and granted (above all fibrous structures, if not stretched, tend to become shorter) and must adapt itself to. It is evident that all the anatomic-physiology of the region (upper thorax, cervical spine, shoulders, skull, above all level C1-C2 etc.) is not symmetric while static and in movement. Many basic functions (chewing, swallowing, phonation, respiration, balance and perhaps hearing, vision, circulation etc.) are influenced by this imbalance.

Rehabilitation patients with acute stroke: walk in a park or jumping over barriers?

K. Lyadov, T. Sapovalenko, I. Sidiyakina, T. Isaeva, N. Lovtzevich, M. Makarova

???????

The importance of medical research of stroke and development of rehabilitation technique is explained by the fact that, currently, stroke is the most common cause of death and disability after the first occurrence. In spite of all the efforts undertaken by Russian medicine, a number of stroke cases continuously grow. Mean incidence is 400,000 strokes in year in Russia. It's hard to overestimate the importance of careful attention to treatment procedures and rehabilitation technique available in intensive care units and standard practices used during rehabilitation treatment starting within 24 hours after stroke. At this time, there is no commonly accepted recommendation with respect to time of activation and intensity of

rehabilitation during acute cerebral ischemia. On the other side, there is an opinion that early rehabilitation may lead to hemodynamic disturbances, intracranial pressure increasing, irregular heart rate and contribute to unsafe assisted ventilation. It seems that all negative effects listed above can be avoided if rehabilitation is done correctly with careful monitoring of patient's vital signs. Currently, there are four criteria (The last and the largest Phase II study of very early mobilization - AVERT (A Very Early Rehabilitation Trial, 2008) for early rehabilitation in stroke patients. However, there is no clear recommendation for early rehabilitation by active physical mobilization and verticalisation for patients with cardioembolic type. At this time, this group of patients is treated empirically using various durations for verticalisation. This *activity* is viewed as an important step towards the development of criteria and duration for early rehabilitation procedures for stroke patients with cardio diseases. **Materials and methods.** A study group of patients consisted of 30 stroke patients, caused by various factors including 9 patients (7 males) suffered from cardioembolic stroke (ages between 48 and 73 years) that occurred from 3 days to 4 months prior to the time of study. The severity of stroke was averaged at 13.6 points by NIHSS. All patients suffered from hypertension combined with atherosclerosis. Seven out nine patients had ciliary arrhythmia in paroxysmal (1 patient) and chronic (6 patients) types. Severity of stroke and level of motor disturbances were evaluated by using NIHSS, Fugl-Meyer Motor Function Assessment, Ashworth Scale, Index Bartel in admission, on the 10th, 20th, 30th day and at a check-out time. Also, all patients were assessed by CT, TCDS of cerebral vessels and Duplex Ultrasound Scan of lower limbs vessels, ECG, and transthoracic ECG. In addition twenty-four-hour monitoring of systolic blood pressure, heart rate, blood saturation, ECG had been analyzed at admission, at 10th, 20th, 30th day and after treatment. All patients received standard hypotensive and metabolic medications. Additionally, all patients were treated by thrombolytic therapy based on age factor and cognitive disturbances. Non-medication based treatment included such methods as physical therapy by changing body positions, massage, pneumocompression of the lower limbs, passive-active kinesiotherapy, electro-stimulation of muscles, robotics therapy using Erigo and Lokomat devices, sessions with a speech specialist and neuropsychologist. **Results.** During the initial days of active rehabilitation therapy four out of nine patients showed signs of cardio-vascular problems, like lack of breath, swelling feet, etc, that resulted in a respective decrease of rehabilitation intensity and increase of treatment duration with average of 45 days. Other five patients didn't show signs of cardio de-compensation during active rehabilitation, but expressed elevated levels of fatigue under physical therapy. The latter led to decrease in duration of procedures of active kinesiotherapy. After rehabilitation, all patient showed positive clinical changes: reduction of stroke severity by 53.3% per NIHSS, reduction of neurological deficit by 36.7% per Fugl-Meyer scale, increase of Bartel Index by 32.7%. Results of testing, including CT- perfusion, TCDS of cerebral vessels, ECG, performed at a check-out confirmed positive effect of rehabilitation program. **Summary.** Results of the study show that patients suffered from a cardioembolic stroke have a lower tolerance to physical activities, especially at the initial phase of rehabilitation. At this time, there are no safe and accurate methods to evaluate patients' tolerance to physical therapy. This fact limits, complicates and effectively delays start of active rehabilitation of patients. It seems reasonable to develop specialized test procedures that would allow evaluate patients' tolerance to physical therapy and, at the same time, closely monitor cerebral blood flow. This would allow to find the criteria and to recommend intensity levels for rehabilitation procedures. Additionally, this would allow to take steps towards development of individual rehabilitation programs.

Physical therapy after anterior arthroscopic bankart repair

D. Mitrovic, I. Diklic, D. Bogdanovic, I. Miljkovic

Institute for Orthopaedic Surgery "Banjica", Belgrade, Serbia

Until now it was considered that the arthroscopic Bankart repair of the anterior shoulder instability was less reliable method of reconstruction than of the open one, causing a longer period of postoperative immobilization to heal repair tissue and delay rehabilitation. The aim of this research was to show clinical results of postoperative immobilization and rehabilitation after Bankart repair anterior to shoulder instability. From March 2005 to January 2006 there were 29 arthroscopic reparations anterior Bankart lesion using bioresorption Anchor. The average clinical monitoring of patients was amounted to 34 months. There were 21 men and 8 women with a mean age of 19.5 year. In this study there were no active athletes. Accelerated post-

operative rehabilitation have started the second postoperative day and consisted of exercises to increase mobility and strength of shoulders divided into phase. The external rotation is greater than 30 degrees and is not allowed until the sixth postoperative week. The protocol was used by the kinesiotherapy "Banjica". Analysis health outcomes related to pain, range of motion, return to activities, recurrent instability and opinions patient. For this purpose a questionnaire was used by the society of American Shoulder and Elbow Surgeons (ASES). In this investigation there was no recurrent instability. Three cases were positive provocation test instability. In one patient until the 14th postoperative day the pain was present with less intensity. All patients achieve the full scope of mobility and all the activities before injury were returned. Short-controlled immobilization and early rehabilitation after arthroscopic Bankart repair are a safe method of renewal postoperative shoulder function at the group of patients.

References

- Wilk KE, Reinold MM, Andrews JR: Postoperative treatment principles in the throwing athlete. *Sports Medicine and Arthroscopic Review*; 2001;9:69-95
enters, T. R., A. K. Franta, et al. Arthroscopic compared with open repairs for recurrent anterior shoulder instability. A systematic review and meta-analysis of the literature. *J Bone Joint Surg Am* 2007;89(2):244-54.
Matsen, F. A., 3rd, C. M. Chebli, et al. Principles for the evaluation and management of shoulder instability. *Instr Course Lect* 2007;56:23-34.
The Journal of Arthroscopic and Related Surgery, Vol 18, No 5 (May-June), 2002; pp 469-482.

Treatment with botulinum toxin in patients with adhesive capsulitis. Preliminary pilot study of the treatment with botulinum toxin in patients with rigidity of shoulder and elbow

G.A. Magagni¹, G. Porcellini², F. Campi², P. Righetti³, T. Di Gregorio³, R. Galassi³, I. Panzini³

¹UO RRF Ospedale Ceccarini Riccione AUSL, Rimini

²UO Chirurgia della Spalla Ospedale Cervesi Cattolica AUSL, Rimini

³Settore Ricerca e Innovazione U.O. Qualità e accreditamento AUSL, Rimini

Introduction. Rigidity between 30th and 60th day after surgery in elevation and external rotation which tends to slow down and stop the progression of recovery is noted in approximately 20% of patients that have undergone surgery for fracture or lesion of the rotator cuff. In 2-5% of cases, the situation evolves towards an adhesive capsulitis and the consequent prolongation of rehabilitation treatment for up to 13 months. The authors propose the use of botulinum toxin in the contracted muscles in order to reduce tension and muscle pain and allow the recovery of joints. It is assumed that the muscle contraction in STSC remain beyond the 90° and so does not, permit as a rigid string, the elevation and external rotation of the humerus. Using a peripheral muscle relaxant such as botulinum toxin one reduces the tension of the STSC and makes a quick recovery of the articular range with a reduction of the pain. We wanted to evaluate and assess the effectiveness of treatment with botulinum toxin on the recovery of joints in patients with shoulder stiffness after surgery, that evolve in adhesive capsulitis. The primary endpoint of the study was the increase in joint range as measured ROM in articular degrees on average up to 80% of normal. Secondary end-points was reducing the time between beginning treatment and articular recovery, the reduction of pain and use of anti-inflammatory drugs and painkillers. **Materials and methods.** 10 patients mean age 55.6 with a diagnosis of adhesive capsulitis, 8 females and 2 males, 6 left shoulders and 4 rights were treated with botulinum toxin. During the first examination, after signing the informed consent, the patient data (date of birth, diagnosis, intercurrent disease, the date of the operation, ROM, Constant score and Dash) were recorded and the patients were rated again on the 30th and 60th day from injection of the drug. The patient is rechecked 6 months after inoculation. All patients were treated with inoculation in the M. STSC of 50 U of botulinum toxin type A diluted in 2 ml of NaCl 0.9% in a single injection and 50 U of M. biceps in 2 places of inoculation. We infiltration the technique described by de Boer in 2004 with the landmark medial border of the scapula with a needle, 9 cm long. In the first two patients have used the EMG control and then gained the safety of the technique, without EMG. In this study all patients were affected by adhesive capsulitis. The program was based on a passive mobilization of the joint with stretching exercises maintaining tension for at least 5-10 seconds and were performed in combination with exercises for modulation of muscle tone and the complete chain of the upper limb muscles. Selective movement was always inserted in the totality of gesture and postural control of trunk and limbs. Parametric and nonparametric statistical tests were used to compare the variables at time 0, 30 days to 60 days and 180 days. Will be considered statisti-

cally significant $p < 0.05$. The study has been approved by the ethics committee Area Vasta Romagna on 09/10/2007. The experimental project was carried out in partnership with the UO for Surgery of the shoulder and elbow of the Cattolica Hospital "Cervesi" AUSL of Rimini, headed by dr. Porcellini. The cost of treatment with botulinum toxin provided was financed by Banca Popolare di Ancona at a branch of Riccione, Viale Ceccarini. **Discussion.** The 10 patients were evaluated 3 months after treatment botulinum and the results after 6 months will soon available. The Constant score provides an overall score and subjective subscales (pain and autonomy) and objective (joints and strength) allow us to analyze in greater detail the results. Overall score showed a shift from 53.2 at T0 to 32.1/100 to T1 (after 30 days) and 68.7 at T2 (after 60 days). The improvement was also evident in the subscale with subjective and objective pain reduction with a recovery of the joints. The evaluation of the results of the questionnaire Dash confirmed the trend of improvement with a halving of base scores: it 23:25 at T0 to 41.95/100 at T1 and to 19:32 at T2. **Conclusion.** The primary endpoint of the study was set in verifying whether the proposed treatment leads to an improvement of articular range up to 80% of the normal range. The results confirmed that at 60 days from the use of t. Botulinum patients on average, reached 158 degrees vertically (corresponding to 80% of the normal range) with only 2 patients with values of 120° at the time. All patients reported reduced pain with consequent reduction of anti-inflammatories drugs and painkillers. The inoculation method required a short apprenticeship, and is of simple execution. The cost of treatment with botulinum toxin (average 100 U per patient) was about 130 euros. The cost must also be compared to the savings achieved by the reduced use of anti-inflammatory drugs and painkillers, reducing the number of rehabilitation sessions, and the earliest possible resumption of work. Rehabilitation treatment was based on 2 months of 2 or 3/weekly sessions (compared to 6 - 12 of treatment described in the literature for adhesive capsulitis).

References

1. Treatment of recurrent posterior dislocation of the shoulder in palsy by injection with botulinum toxin A into the M subscapularis; KS de Boer, PM Rozing, JH Arendzen. *Clin Rehabil* 2004;18(7):764-6.
2. Safety of botulinum toxin type A: a systematic review and meta-analysis; M. Naumann, J. Jankovic; *Curr Med Res Opin* 2004;20(7):981-990.
3. Use of botulinum toxin type A in management of adult spasticity; A.B. Ward et al.; *Eur. Med phys* 2004;40:83-84.
4. Antispasticity drugs: mechanisms of action; *Annals of Neurology* 1994; 44(suppl 9) S1-S11.
5. Fisiologia articolare; Kapandij 1974, ED DEMI Roma.
6. Biomechanics of the shoulder; Bechtol CO, *Clin Orthop* 1980;146:37.

Physical fitness training and mood

S. Petrovic, S. Tosic-Golubovic, D. Gugleta, T. Petrusic

Department for physical Medicine Nis, Psychiatry Clinic Nis, Serbia

There is an extensive scientific literature linking lack of physical exercise with depressed mood, limited coping skills and low levels of psychological well-being. Physical inactivity is also associated with increased risk for many of the medical problems. It is probable that there are reciprocal relationships between physical activity and depression: depressed mood leads to inactivity, while in some circumstances exercise can alleviate depression. The aim of our prospective study was evaluation of levels of anxiety and depression among 30 subjects involved in 3 time weekly fitness program with three months duration, as well as to compare the obtained results with the same among age, sex and sociodemographic matched inactive individuals. Method: Except standard psychometric instruments for anxiety and depression employed: Beck Depression Inventory-BDI and Beck Anxiety Inventory-BAI, all subjects also responded to questionnaire items devised by the authors, focused on sociodemographic characteristics. Two evaluation procedures were realised, one at the beginning of the fitness programme and the second two months later. Within-and between-group comparison were performed using SPSS version 8.0. Results: Inactive subjects showed significantly higher scores for anxiety and depression during first and second evaluation. The levels of anxiety and depression decreased significantly after 3 months of physical exercise. Conclusions: Our prospective study documented more positive moods in active compared with inactive people. Physical exercise had favorable effects on the levels of anxiety and depression.

References

1. Goodwin Ad. Association between physical activity and mental disorders among adults in the United States. *Prev Med* 2003; 36:697-703.
2. Motl RW, Birnbaum AS, Kubik MY, Dishman RK. Naturally occurring changes in physical activity are inversely related to depressive symptoms during early adolescence. *Psychosomatic Medicine* 2004; 66:336-342.

Principles and new technologies of rehabilitation in stroke

L.A. Chernikova

Research Center of Neurology of RAMS, Moscow, Russia

Introduction. Rehabilitation of the patients after stroke is one of the actual problems of modern medicine. It is caused as the prevalence of a stroke all over the world (around 400 000 cases every year in Russia), and discoveries in the field of the fundamental sciences that confirmed a main role of the afferentation for development of plasticity in the CNS. The past fact promoted to rapid development and introduction of new rehabilitation technologies, such as the neuromuscular electrostimulation (NES), the robot-therapy, EMG feedback training etc. The purpose of the present research was to study of the efficiency of some new technologies in the acute and chronic phases after ischemic stroke (IS). **Materials and methods.** The safety and efficiency of the early and intensive NES of the paretic hand extensors have been studied at 29 patients with a first IS in the territory of middle cerebral artery (MCA). NES was made 20 min twice per day from the first 48 hours after stroke onset during 3 weeks. The safety of NES was assessed with diffusion/perfusion MRI control of lesion size, the influence of NES on the upper extremity recovery – with NIHSS, Motor assessment scale (MAS), Fugl-Meyer Scale (FMS), Ashworth Scale (AS) and Barthel Index (BI). Besides the safety and efficiency the early verticalization using tilt-table with integrated robotic stepping function ERIGO (Hocoma, Switzerland) have been studied at others 30 patients with a first stroke of anterior circulation territory, moderate to severe severity according to NIHSS $14 \pm 3,1$. The safety was estimated using of the non-invasive monitoring of blood pressure, heart rate, oxygen saturation, and the efficiency - according to NIHSS, Motoricity index (MI), AS. The effects of the intensive gait training with the Lokomat system on the some clinical and kinematic parameters have been studied at 77 hemiplegic stroke subjects (mean age $53,6 \pm 10,4$ years, mean duration of time from the stroke onset $47,2 \pm 33,4$ days) with mild to moderate lower limb impairments. The effects of the gait training were assessed using the gait analysis system "Videoanalysis - Statokin" (Russia) and the clinical analysis (MI, AS, 10-m timed walking speed). In the chronic stroke period (up to 1 year), the opportunity of the functional reorganization of motor structures of the CNS during the learning of the precision grip by the Electromyographic biofeedback (EMG-BFB) technology has been studied at 32 patients (mean age $54,5 [50; 59]$) with a first IS in the territory of MCA. CNS plasticity was assessed with fMRI, the influence of the EMG-BFB on the upper extremity recovery – with MAS, FMS, AS and BI. **Results.** The data show that in the acute phase of stroke NES of the paretic hand extensor muscles improved motor recovery of the upper limb and have no any harmful effect on to lesion size and cerebral perfusion (the diffusion/perfusion MRI). It has been shown that the early verticalization with tilt-table ERIGO of the patients with IS is safe and feasible. It might be effective in reducing spasticity and decreasing the time of achievement the vertical position of patients after the ischemic stroke. After the gait intensive training with the LOKOMAT system, we noted the increase of MI for paretic leg at 59.8%, MI for body at 16.5%, the decrease of AS for 42.7% and the tendency of the decrease of the expression of the circumduction gait strategy in paretic leg using the gait analysis system. The peculiarity of the functional reorganization of the motor structures of CNS (according to fMRI) and improvement motor recovery of the upper limb had been revealed after the training of the precision grip by the EMG-BFB technology. **Conclusion.** Introduction of new technologies in complex treatment in view of such principles of rehabilitation as the early beginning, a systematic, long and integrated approach, the attraction of active participation in treatment of the patient, the control of adequacy of loadings increases the efficiency of rehabilitation management and improves the recovery of patients both in acute, and in the chronic period after a stroke. At the same time, it is shown, that the degree of restoration of the impairments depends on the size and localization of the lesion, initial severity of neurological defect, a condition of cognitive dysfunctions and affective disorders, the laterality of the lesion, age of the patient, and also adequacy (intensity and volume) rehabilitation.

Effects of the mechanical support stimulation in patients with acute ischemic stroke

I.V. Saenko², L.A. Chernikova¹, I.B. Kozlovskaya², R.N. Kononov¹, M.V. Krotenkova¹, K.A. Melnik²

¹Research Center of Neurology of RAMS, Moscow, Russia

²SSC RF Institute of biomedical problems, Russian Academy of Sciences, Moscow, Russia

Introduction. It is well known that support deprivation plays the main role in the development of disturbers of tonic motor system and pose synergies in conditions of microgravity and prolonged hypokinesia. Mechanisms of sensomotor disorders that develop as a result of various pathologic processes are very close to those evoked by microgravity. Immediate reduction in motor activity limits the possibility of recovery of the lost functions and reduction in motor deficit, as well as the possibility of taking countermeasures against formation of a pathological motor stereotype and stable loss of locomotor's functions. At present, treatment and rehabilitation of patients with motor disturbances, as a rule, are focused on the central nervous system damage, but the importance of changes in the peripheral nervous and muscular systems caused by abrupt immobilization (hypokinesia) against the original pathology of the patients is underestimated. However, a lot of information, confirming the fact that decrease in motor activity and the related changes in the activity of regulatory and metabolic mechanisms worsen the course of pathological processes caused by original disorders in various structures, has been accumulated in recent years. The mechanical support stimulator (MSS) of feet has been created of the State Scientific Center of the Russian Federation the Institute of Medical and Biological Problems of the Russian Academy of Sciences for preventive maintenance of the support afferentation deficiency in space flights. However the role of this device in prevention of the locomotion disturbances at the poststroke patients is unknown. In this study we tried to assess the influence of mechanical support stimulation on the recovery of the motor disturbances and the terms of verticalization. **Materials and methods.** 22 patients (mean age $61,3 \pm 10,4$ years) with moderate to severe ischemic stroke (NIHSS at admission $14 \pm 3,1$) admitted within 72 hours of symptom onset were included into the study. The control group (8 patients) received only standard rehabilitation. The basic group (14 patients) received additionally 6-9 sessions of the mechanical support stimulation (20 min twice a day). Patients were assessed by NIHSS, Rankin Scale, Ashworth Scale, Barthel Index at admission, before and after the course of the mechanical support stimulation, at 1 month after stroke onset. The MSS ensures mechanical stimulation of the support zones of feet in the modes of natural locomotion by activating posture synergies. During MSS there were stimulated the calcaneum and metatarsal support zones of feet at patients. The MSS set includes pneumoinsoles installed in fixing footwear. Active elements of pneumoinsoles are pneumocameras providing pressure in a pulse regime. The slow walking mode has been used 75 steps/min (37,5 cycles/min and pressure $0,5 \pm 0,15$ kg/cm²). The mechanical support stimulation begins in patents with acute ischemic stroke in the first hours of the their admission in the Research Center of Neurology and continues 20 min twice a day during 6-9 days until beginning verticalization using tilt-table with integrated robotic stepping function Erigo (Hocoma, Switzerland). **Results.** The NIHSS score at the admission in the basic group was 14 [11,5-17,25], in the control group was 14 [11,5-17]. After one month of the stroke in patients of the basic group there was the decrease of NIHSS score to 8 [7,5-10,5], in the control group – to 11 [9,25-14] ($p=0,007$). At the admission no patients in both of the groups had the spasticity. After 1 month of the stroke we observed spasticity (2 points and more using modified Ashworth scale) in the paretic leg in 2 patients of the basic group and in 4 patients of the control group. At admission the mRS in basic group was $4,57 \pm 0,51$ and in control group $4,51 \pm 0,47$. At 1 month after stroke in basic group there was the decrease of mRS to $3,42 \pm 0,31$, in the control group – to $3,71 \pm 0,46$ ($p=0,02$). **Experimental research.** We have used the functional MRI (1.5T Symphony, Siemens) to assess the mechanism of action of the support afferent input obtained by mechanical support stimulation at 8 healthy subjects (6 men and 2 women) at the mean age $29 \pm 3,2$ years. The fMRI was made in a block-design, with alteration of task condition (30 sec) and the rest condition (30 sec) during 3 min. As a task conditions were the stimulation of only foot or the mechanical support stimulation in the regimen used for treatment. The data were analyzed with SPM5. **Results.** It was revealed the activation only of left paracentral lobule during stimulation only one right foot. During the mechanical support stimulation in the slow walking mode it was revealed the activation of the brain areas participating in performance complex locomotion action: activation of left and right paracentral lobules, right superior parietal lobule, right supramarginal gyrus, middle and inferior temporal gyri, left supramarginal gyrus. **Conclusion.** It is possible that the beginning of mechanical support stimulation from the first hours after stroke onset prevents the development spasticity in the paretic leg and promotes more considerable restoration of motor functions by the end of 1 month after stroke onset. We speculate that the restoration of such complex physiological act as walking can be improved with the walking ini-

tating stimulator. Apparently, the mechanism of the mechanical support stimulation is the activation of the brain areas participating in performance complex locomotion action with activation of secondary sensory areas.

Neurofeedback and network rehabilitation

R.YU. Guk⁵, O.A. Jafarova^{1,2}, M.M. Sklyar^{1,2}, L.A. Chernikova³, A.F. Tarasevich⁴, M.B. Shtark^{1,2}

¹Research Institute for Molecular Biology and Biophysics, RAMS, Novosibirsk, Russia

²Company "Biofeedback Computer Systems", Novosibirsk, Russia

³Research Center of Neurology of RAMS, Moscow, Russia

⁴Foundation "SM Charity", Krasnoyarsk, Russia

⁵Siberian Clinical Centre FMBA of the Ministry of Health and Social Development, Krasnoyarsk, Russia

Introduction. Rehabilitation period is believed to be the least technologically supported stage of the treatment process. In the "doctor - patient" relations medical treatment is alternated with patient's isolation at home. This is mostly manifested in patients with the consequences of brain injury, cerebral-spinal injury, and cerebrovascular accidents. A wheel-chaired patient is short of permanent medical control that results in poor rehabilitation outcome. The project "Network rehabilitation" (Novosibirsk, Krasnoyarsk, Moscow) is aimed to: maintain an effective connections between a patient and a rehab specialist; provide a patient with a rehab instrument, neurofeedback technology, based on the vital mechanism of the adaptive biological feedback; create a 3-level information system using Internet technologies; apply a virtual reality phenomenon and game-based biofeedback; support user's socialization in the network. Therefore a patient becomes an active participant of the treatment instead of being a passive object of the rehab procedures. The biofeedback is a modern computer technology based on the mechanisms of physiological functions self-regulation that registers and quantifies the organism's (system) resources. The biofeedback technology allows patients learning the ways of controlling involuntary physiological parameters and forming new motor, sensory and behavioral skills that secure the rehab effectiveness, especially when it is difficult or impossible to actualize a potentially recoverable function using convenient methods. **Materials and methods.** Main components of the system: 1) EMG and EEG-biofeedback stationary 2-monitors system involves a home EMG and EEG trainer. During neurofeedback rehabilitation in a hospital a patient learns the new skills that support the forming of the stable skills of self-regulation in the motor, speech and cognitive area based on the main characteristic of the nerve system that is neuroplasticity. At home the patient continues practising rehab procedures, regularly sends out training reports and data, and gets more recommendations from the therapist. It is possible to ask a question if necessary, or share training experience with the therapist/instructor or other patients via Internet. 2) The system involves three levels: a patient's PC with interactive interface for data primary analysis and compression; data storage, local high-speed network including one or more servers; the set of subject-oriented OLAP-applications, data presentation and analysis. Theoretically, the network rehab may involve unlimited number of users, considering the sensible organization of the work of rehabilitation specialists. 3) The game biofeedback based on the EMG and EEG effective control provide self-improvement of recovery algorithms. The following key characteristics are essential: game scenario directly depends on the conditions of motor function; it is limited by the "start" and the "finish" points of the competition; each consequent game trial has the goal of improving the previous one which secures the "spontaneous" mechanism of self-improvement; the background change prevents patient's habituation; competition enhances patient's motivation, actively involving the mechanisms of self-actualization; the game-based biofeedback fits in the modern cultural trend and contributes to the patient's self-expression, being supported with photorealistic (3D) graphics, players' ratings, morphing and other modern media. The wide use of the virtual reality phenomenon, patient's immersion into the virtual environment allows mirroring him/her self and developing actually his/her own motor and sensory stereotype. **Results.** Ranking of prognostic characteristics according to subjective and objective markers based on the data of 19 patients with spinal cord injury of various level of affection. 3.1. A stable increase of the amplitude of raw and integral EMG during first 10-20 training sessions is regarded as positively prognostic. 3.2. The increase of limbs circumference and joint range of motions. 3.3. The improve-

ment (recovery) of the superficial sensitivity at 2-4 segments more, later the change of the deep sensitivity (sense of pressure, muscular sense). 3.4. Cognitive dynamics: the change of patient's attitude to the learning process and self-regulation skills acquisition, participation (individually and/or via network) in the computer game-based competition where one can win only using these effective and stable skills. The research has demonstrated that participating in the project motivated the patients with limited motor functioning to undergo treatment and improved their quality of life. **Conclusion.** The unique "Network Neuro-Rehabilitation project" was implemented for the first time in Russia by the Research Institute for Molecular Biology and Biophysics and Scientific Center for Neurology of the Russian Academy of Medical Science jointly with "Biofeedback Computer Systems Ltd." company and Siberian Clinical Centre FMBA with financial and organizational support of Foundation "SM Charity". The project made it real to rehabilitate the patients with severe motor disorders on everyday basis and secured constant contact between patients and therapists. On the whole, the Network Rehabilitation, as a method of training of the individual's self-regulation skills, is an innovative line of the development of neurofeedback technology in the treatment of patients with motor disorders and limited physiological functioning of various origin.

Rehabilitation following cardiopulmonary transplantation

M. Bowman

Staff Specialist Rehabilitation Medicine, St Vincent's Hospital, Darlinghurst NSW, Australia

Introduction. Organ transplantation is now a mainstream treatment option for end stage cardiopulmonary disease. Worldwide, more than 7000 procedures are performed annually. Improvements in surgical technique and immunosuppression have led to improved longevity and quality of life. However, complications are common due to chronic disease and immunosuppression side effects. The purpose of this paper is to provide an overview of recent advances for this condition, and an update on the causes of disability and the rehabilitation management following cardiopulmonary transplantation. **Materials and methods.** A review of the literature **Results.** Recent advances in transplant management include improved surgical technique, mechanical support, and early aggressive management of graft rejection. Following transplantation, disability may occur due to surgical complications, immunosuppression, infective complications, and medication side effects. The most common complications are neurological, occurring in up to 30% of patients. Immunosuppressive complications include graft rejection and early organ failure. Infective complications include atypical infections. Medication complications include myopathy, neuropathy, and tremor. Reduced exercise tolerance may be exacerbated by organ denervation and neurohumoral factors. Advances in management have led to improved survival, with a survival half life of 10 years for heart and 5 years for lung transplantation. **Conclusion.** Cardiopulmonary transplantation may now be viewed as a chronic disease. Disability is common with this condition, and is multifactorial in nature. The role of rehabilitation in the management of the transplant recipient is increasing.

References

1. Patchell R. Neurological complications of organ transplantation. *Ann Neurol* 1994 Nov; 36(5): 688-703.
2. Taylor DO, Edwards LB, Boucek MM, Trulock EP, Aurora P, Christie J et al. Registry of the International Society for Heart and Lung Transplantation: twenty-fourth official adult heart transplant report-2007. *J Heart Lung Transplant*. 2007; 26(8):769-81.
3. Marconi C, Marzorati M. Exercise after heart transplantation. *Eur J Appl Physiol* (2003) 90 : 250-259.

Anxiety at the patients post-stroke- impediment in rehabilitation program

D. Dimulescu, G. Chiri, I

U.M.F. „Carol Davila” Bucharest National Institute of Rehabilitation, Physical Medicine and Balneoclimatology

Objectives. Showing the influence of anxiety on the results achieved in improving physical dysfunctions and disabilities after a rehabilitation program applied to post-stroke patients. **Materials and methods.** The study has included two groups of post-stroke

patients: 1 – case group and 2 - control group, with 25 patients each, of both sexes (predominantly male), aged between 40 and 70 years. We performed a psychological screening to hospitalized patients using STAI anxiety scale: in group 1 were included patients with scores higher than 49 points (above average and high anxiety), while in group 2 were included patients with scores under 49 points (low and average anxiety). Clinical and functional parameters that we evaluated were physical dysfunctions (that included spasticity, joint mobility of the affected segment) and disabilities (that included balance and gait disorders, addiction). Scales that were used: Ashworth Scale, Tinetti Balance Scale, Tinetti Gait Scale, ADL 24, joint examination. **Results.** After the physical-kinetic treatment was applied to the two groups, we achieved following improvements: spasticity -16.82% (group 1) and 23.50% (group 2), joint mobility -20.25% (group 1) and 26.43% (group 2), balance disorders - 17.45% (group 1) and 24.73% (group 2), gait disorders - 22.81% (group 1) and 29.46% (group 2), ADL 24 - 8.60% (group 1) and 17.85% (group 2), addiction -17.27% (group 1) and 23.73% (group 2). **Conclusion.** The presence of anxiety (more than 49 points on the STAI scale) has negatively influenced recovery treatment outcomes - physical dysfunctions and disabilities - in post-stroke patients. Anxiolytic therapy and psychological counseling is needed in such cases.

References

1. Aström M. Generalized anxiety disorder in stroke patients: A 3-year longitudinal study. *Stroke*, 1996;27(2):270-5.
2. Carod-Artal FJ, Egido JA. Quality of life after stroke: the importance of a good recovery. *Cerebrovasc. Dis.*, 2009;1:204-14.
3. Chemerinski E, Levine SR. Neuropsychiatric disorders following vascular brain injury. *Mt. Sinai J. Med.*, 2006, 73(7):1006-14.
4. De Wit L, Putman K, Baert I et al. Anxiety and depression in the first six months after stroke. A longitudinal multicentre study. *Disabil. Rehabil.*, 2008, 30(24):1858-66.
5. Fure B. Depression, anxiety and other emotional symptoms after cerebral stroke. *Tidsskr. Nor. Laegeforen*, 2007, 127(10):1387-9.
6. Mukherjee D, Levin RL, Heller W. The cognitive, emotional and social sequelae of stroke: psychological and ethical concerns in post-stroke adaptation. *Top Stroke Rehabil.*, 2006, 13(4):26-35.
7. Smith LN, Norrie J, Kerr SM – Impact and influences on caregiver outcomes at one year post-stroke. *Cerebrovasc. Dis.*, 2004;18(2):145-53.
8. Vashadze Gh V, Beridze LA. Anxiety state in patients during post insult period with old cerebral infarction. *Georgian Med. News*, 2009;(171):47-53.

Pain and disabilities improvement in old patients with knee OA – a result of the complex rehabilitation program

Gheorghe Chiri, i, D.M. Dimulescu, G. Mologhianu
 U.M.F. “Carol Davila” Bucharest, National Institute of Rehabilitation, Physical Medicine and Balneoclimatology

Objectives. The purpose of this study was to assess the efficiency of a program of physical and kinetics rehabilitation for elders with knee osteoarthritis in improving the pain, the physical impairments and the disabilities. **Materials and methods.** This study was performed in The National Institute of the Physical Rehabilitation, Bucharest and consisted of two groups: study group 1 and control group 2, each with 45 patients (males and females), of different ages (>60 years) with knee osteoarthritis. Distinction between the two groups was made based on the treatment applied: the control group (group 2) included patients who received drugs treatment and physical treatment, the study group (group 1) included patients who received drugs, physical treatment and kinetherapy. The clinical and functional parameters assessed were: pain, physical impairments (included: muscular strength, static disorders and mobility of knee) and disabilities (included: Tinetti Gait Scale, ADL 24, D’Aubigné Scale and movement capacity). We also used the scales: visual analog scale (VAS), Tinetti Gait Scale, Tinetti Balance Scale, ADL 24. **Results.** After the physical-kinetics program, the scores for functional parameters recorded improvements as follows: pain- 45,7% (group 1) and 41,4% (group 2); physical impairments: muscular strength- 14,6% (group 1), without improving by group 2, static disorders- 25,3% (group 1) and 16,5% (group 2), mobility of knee- 39,4% (group 1) and 29,7% (group 2); disabilities: Tinetti Gait Scale- 37,8% (group 1) and 28,3% (group 2), ADL- 56,5% (group 1) and 45,4% (group 2), movement capacity- 52,9% (group 1) and 43,7 % (group 2). **Conclusion.** Improvement of pain, physical impairments and disabilities for the study group, who received drugs and recovery treatment, certifies the efficacy of the rehabilitation program- physical treatment and kinetherapy- for the older patients suffering from knee osteoarthritis.

References

1. Deyle GD, Henderson NE, Matekel RL et al. Effectiveness of manual physical therapy and exercise in OA of the knee. A randomized, controlled trial. *Ann Intern Med.*, 2000, 132(3):173-81.
2. Iwamoto J, Takedo T, Sato Y. Effect of muscle strengthening exercises on the muscle strength in patients with OA of the knee. *Knee*, 2007;14(3):224-30.
3. Jan MH, Lin JJ, Lian JJ et al. Investigation of clinical effects of high-and low resistance training for patients with knee OA: a randomized controlled trial. *Phys. Ther.*, 2008;88(4):427-36.
4. Kaupilla AM, Kyllonen E, Mikkonen P et al. Disability in end-stage knee OA. *Disabil. Rehabil.*, 2009;31(5):370-80.
5. Mc Carthy CJ, Mills PM, Pullen R et al. Supplementation of a home-based exercise programme with a class-based programme for people with OA of the knee: a randomised controlled trial and health economic analysis. *Health Technol. Assess.*, 2004, 8(46):iii-iv, 1-61.
6. Salaffi F, Carotti M, Stancati A et al. Health-related quality of life in older adults with symptomatic hip and knee OA: a comparison with matched healthy controls. *Aging Clin. Exp. Res.*, 2005;17(4):255-63.
7. Tsai PF, Tak S. Disease-specific pain measures for OA of the knee or hip. *Geriatr. Nurs.*, 2003;24(2):106-9.

Postural therapy in increasing quality of life at the patients with hip OA

D.M. Dimulescu, G. Chiriți
 U.M.F. “Carol Davila” Bucharest, National Institute of Rehabilitation, Physical Medicine and Balneoclimatology

Objectives. The purpose of this study was to assess the efficiency of a rehabilitation program including postural therapy, in increasing the quality of life at the patients with hip OA. **Materials and methods.** This study was performed in The National Institute of the Physical Rehabilitation, Bucharest and consisted of two groups: study group 1 and control group 2, each with 30 patients (males and females), of different ages (40-70 years: middle age- 58,26 years for the study group and 58,93 years for the control group) with hip osteoarthritis. Distinction between the two groups was made based on the treatment applied: the control group (group 2) included patients who received drugs treatment, physical treatment: ET, TT and KT; the study group (group 1) included patients who associated postural therapy as part of kinetherapy. The clinical and functional parameters assessed were: pain, physical impairments (included: muscular strength, static disorders and mobility of hip), depression, disabilities (included: disorders of the gait and movement capacity), decreasing of drugs consumption, self evaluation of the health state. We also used the scales: visual analog scale (VAS), HAM-D Scale, D’Aubigné Scale, ADL 24. **Results.** After the physical-kinetics program, the scores for functional parameters recorded improvements as follows: pain- 52,4% (group 1) and 39,5% (group 2); physical impairments: muscular strength- 16,2% (group 1) and 9,7% (group 2), static disorders- 23,6% (group 1) and 14,9% (group 2), mobility of hip- 41,8% (group 1) and 32,6% (group 2); depression- 31,3% (group 1) and 23,8% (group 2), disabilities: ADL- 56,7% (group 1) and 47,4% (group 2), D’Aubigné Scale- 42,1% (group 1) and 33,7% (group 2), movement capacity- 51,8% (group 1) and 42,5 % (group 2), decreasing of drugs consumption- 41,4% (group 1) and 29,5% (group 2), self evaluation of the health state- 51,5% (group 1) and 37,9% (group 2), quality of life- 41,2% (group 1) and 31,8% (group 2). **Conclusion.** The superior results obtained for patients with hip OA from the study group (emphasizing on postural therapy inside the recovery program), argues the efficiency of this therapy’s application in increasing the quality of life.

References

1. Arnold CM, Faulkner RA. Does falls-eficacy predict balance performance in older adults with hip OA? *J. Gerontol. Nurs.*, 2009;35(1):45-53.
2. Arokovski JP, Leinonen V, Arokoski MH et al. Postural control in male patients with hip OA. *Gait Posture*, 2006;23(1):45-50.
3. Fransen M, Mc Connell S, Bell M. Therapeutic exercise for people with OA of the hip or knee. A systematic review. *J. Rheumatol.*, 2002;29(8):1737-45.
4. Giemsa C, Ostrowska B, Matczak-Giemsa M. The effect of physiotherapy training programme on postural stability in men with hip OA. *Aging Male*, 2007, 10(2):67-70.
5. Hinman RS, Heywood SE, Day AR. Aquatic physical therapy for hip and knee OA: results of a single-blind randomized controlled trial. *Phys. Ther.*, 2007;87(1):32-43.
6. Pisters MF, Veenhof C, van Meeteren NL et al. Long-term effectiveness of exercise therapy in patients with OA of the hip or knee: a systematic review. *Arthritis Rheum.*, 2007, 57(7):1245-53.
7. Tak E, Staats P, van Hespren A et al. The effects of an exercise program for older adults with OA of the hip. *J. Rheumatol.*, 2005, 32(6):1106-13.

Depression- negative factor in improvement the quality of life at the patients post-stroke

G. Chiri, j, D.M. Dimulescu

U.M.F. „Carol Davila” Bucharest National Institute of Rehabilitation, Physical Medicine and Balneoclimatology

Objectives. Studying the impact of depression on quality of life in post-stroke patients hospitalized in the Rehabilitation Clinic. **Materials and methods.** The study, realized at the National Institute of Rehabilitation, Physical Medicine and Balneology, included two groups of post-stroke patients: 1 – case group and 2 – control group, with 30 patients each, of both sexes (predominantly female), aged over 50. We applied to hospitalized patients Beck depression scale: in group 1 were included patients with a score over 29 points (severe depression) and in group 2 were included patients with a score below 29 points (low and average depression). Following clinical and functional parameters were assessed for in and out-patients: pain (VAS scale), physical dysfunctions (joints and muscles examination), disabilities (ADL 24, Tinetti gait scale, Tinetti balance scale), quality of life. **Results.** At the end of the physical-kinetic treatment, patients in the two groups achieved following improvements: 19,53% (group 1) vs.28,46% (group 2)- for the pain; 13,60% (group 1) vs. 19,22% (group 2)- for the physical dysfunction; 16,25% (group 1) and 25,17% (group 2)- for disabilities; 16,46% (group 1) and 24,28% (group 2)- for quality of life. **Conclusion.** The results of this study demonstrated the impact of depression on quality of life in post-stroke patients, advocating for the association to the rehabilitation treatment for the antidepressant medication and psychological evaluation.

References

- Carod-Artal FJ, Trizotto DS, Coral LF, Moreira CM. Determinants of quality of life in Brazilian stroke survivors. *J.Neurol.Sci.*, 2009;284(1-2):63-8.
- Chemersinski E, Robinson RG, Arndt S, Kosier JL. The effect of remission of post stroke depression on activities of daily living in a double-blind randomized treatment study. *J. Nerv. Ment. Dis.*, 2001, 189(7):421-5.
- Gabalton L, Fuentes B, Frank-Garcia A, Diez-Tejedor E. Post-stroke depression: importance of this detection and treatment. *Cerebrovasc. Dis.*, 2007, 24 Suppl. 1:181-8.
- Lenzi GL, Altieri M, Maestrini I. Post-stroke depression. *Rev.Neurol.(Paris)*, 2008, 164(10):837-40.
- Nys Gm, van Zand Voort MJ, van der Worp HB, de Haan EH, de Kort PL, Jansen BP, Kappelle LJ. Early cognitive impairment predicts longterm depressive symptoms and quality of life after stroke. *J. Neurol. Sci.*, 2006, 274(2):149-56.
- Rastenyte D, Kranciukaite D. Poststroke depression and its impact on quality of life. *Medicina (Kaunas)*, 2007, 43(1):1-9.
- Sims j, Galea M, Taylor N, Dodd K, Jespersen S, Joubert L, Joubert J. Regenerate: assessing the feasibility of a strength-training program to enhance the physical and mental health of chronic post stroke patients with depression. *Int. J. Geriatr. Psychiatry*, 2008, 24(1):76-83.

Clinical effects of stimulation using prosthetic insoles in patients with chronic mechanical low back pathologies: Randomly controlled double-blind trials

S. Orzes¹, G. Sensi², M.A. Fusco³, M. Ambrosone⁴

¹Istituto di U.O. Fisioterapia U.S.S.L. 2, Feltrè

²U.S.S. 6 Ospedale San Bortolo, Vicenza

³Responsabile Scientific Factory, Ks International Group, Mercogliano

⁴Istituto di Ortopedia, Clinica universitaria Milano Bicocca, Osp. San Gerardo, Monza

Introduction. Chronic low back pathology is one of the most frequent pathologies, if not the most frequent among doctors who practice general medicine in outpatient clinics as well as specialists of the locomotive apparatus, let alone one of the most wide spread pathologies in modern society. When treating low back pain the purpose of the trials is to evaluate the efficiency of stimulation with the use insoles administered to patients in a standing position while trying to highlight, with the use of an evaluation scale, the significant statistical differences between the results obtained at the beginning and at the end of the trials. **Materials and methods.** The selected patients according to eligibility requirements were 65 people of which 70.8% women (with an average age of 54 ± 14) and 29.9% men (with an average age of 52 ± 8). During the trial 64.4% of the subjects resulted as being employed, 25.6% of the subjects were retired, 6,7% of the subjects were homemakers and 3,3% of subjects were students. The patients were divided into two groups: Group A or control group (made up of 25 female patients and 9 male patients) and Group B or experimental group (made up of 21 female patients and 10 male

patients). Before entering treatment the patients were evaluated through the answers given on a questionnaire for pain evaluation, consequent disability and quality of life. The same questionnaire was then administered in the successive follow up sessions in six month intervals and at the end of the treatment cycle. The statistical analysis was carried out through test t-student both for the match samples as well as the independent samples. **Results.** Among the patients that completed the trials, for the experimental group there were significant differences between the beginning and the end of the treatment both with regards to the evaluation of pain as well as disability. In particular, there were significant statistical reductions in regards to pain evaluation (pre-treatment 6.3, post-treatment 4.5), interference in work related activities (pre-treatment 5.3, post-treatment 3.6) and interference with sleep (pre-treatment 4.37, post-treatment 2.10). For the control group there were improvements but no significant results. From the evaluation of pain which was measured with the Visual Analogical Scale (VAS) a significant reduction of pain was noticed: from pre-treatment to post-treatment with values were from 4.6 to 3.7 (average results in the two follow up sessions were equal to 4.0) The Rolland-Morris Disability Scale (RMDS) that was taken into consideration is made up of 24 phrases that describe typical situations of a subject that suffers from pain. The maximum score, which corresponds to the degree of disability, is 24. The scores were calculated in relation to the maximum scores and were used for a before-after treatment evaluation. From the pre-treatment phase to the post-treatment phase the scores diminished in a significant manner going from 38.8% to 22.4% (average results in the two follow up sessions were equal to 23.6%). **Conclusion.** For patients affected by chronic low back pathologies, the experimentation with insoles Ks Medical used in the trials demonstrated to be efficient in the reduction of pain and disability. In addition there were no collateral effects recorded.

The rehabilitative approach to the muscular recovery of sarcopenic elderly: review

R. Saggini, P. Iodice, L. Di Pancrazio, V. Piscella, R.G. Bellomo

Dept. Basic and Applied Medical Sciences, “G. d’Annunzio” University, Chieti, Italy

Introduction. During aging muscle tissue is gradually lost, resulting in diminished mass and strength, a condition referred to as sarcopenia (1). The consequences of sarcopenia include decreased strength (2), metabolic rate (3), and maximal oxygen consumption (4). These physiologic decrements in maximal strength and fitness probably contribute to weakness and a loss of independence (5) and subsequent increased health care costs. The onset of Sarcopenia occurs at the age of 50 and an important symptom is the atrophy of fibers. The onset and the progression of this disease depends on several agents as genetic factors, life-style, ageing-related pathology, hormonal level decrease (GH, testosterone, IGF-1), oxidative damage of fibers (6), mitochondrial damage, loss of motor units, decreased regenerative capacity of skeletal muscle stem cells (7). This loss of fitness is also observable in highly active older adults, who continue to exercise regularly, yet display rates of decline are similar to their sedentary peers (8). However, fitness remains greater at any age in those who exercise regularly as compared with those who do not. A lot of studies, which have been carried on since 1980, suggest that a regular training programs are a concrete means to prevent and/or reduce functional decline due to aging (9). The prose is that a regular and moderate exercise could make people feel better but today there aren't specific indications for elderly people. The question is: could specific and intensity-graduated training slow down or contrast the Sarcopenia progression? And is there some opportunity for people coerced to bed rest? The aim of our ongoing project was to study the effects of three specific training protocols: sensorimotor and resistance training as active work and energy vibrational training as passive work. **Materials and methods.** 30 male volunteers affected by sarcopenia, aged between 64 and 80 years participated in the study. The volunteers were randomly assigned to one of three training protocols which have always had a period of 12 weeks: 1) Global Sensorimotor Training (Gsm). The subjects performed 20m sessions with a the system I-Moove (I-care, France) multi-sensory-protocol training; 2) Resistance Training (Ret). The subject performed a training for strengthening of the lower limbs using two isotonic machines: Leg-extension and Leg-press. In the 12 weeks the subject carried our a training on both the machines as follows: 3 sets of 12 repetitions at 60 to 85%RM and a rest between sets of 2 minutes; 3) Vibratory high intensity focal therapy (Vif). Patients were subjected to acoustic focal vibratory therapy at a frequency of 300Hz for 15 minutes. The application was made on vastus medialis, vastus

lateralis and rectus femoris muscles. Before and after the training muscle strength was measured by isotonic and isometric strength tests. At the some times, the Analysis of walking and Stabilometric Test at 52 sec, with open and closed eyes, were performed. **Results.** Each training increased the bilateral isometrical strength of inferior limbs. The evaluation of the ability to balance the T1 stabilometric platform showed a significant improvement of the sway area and of the ellipse surface ($p < 0.01$) in the Gsm group. The analysis of walking shows a significant increase in the length of the halfstep in all three groups, by 107% in the Gsm ($p < 0.001$) and 65% in Ret ($p < 0.05$) and 91% in Vif ($p < 0.01$). **Conclusion.** Training, in all three proposed conditions, allows an improvement in muscle strength with a consequent increase in postural stability and, of course, each training load produces specific adaptations. In conclusion we consider the motor and global sensory stimulation, obtained through focal vibration and proprioceptive training, is a new and effective rehabilitative training approach, especially for those aging conditions in which the degeneration of joints and/or neuromuscular difficulties greatly reduces the ability to perform exercises.

References

- Argiles JM, Busquets S, Felipe A, Lopez-Soriano FJ. Muscle wasting in cancer and ageing: cachexia versus sarcopenia. *Adv Gerontol* 2006;18:39-54.
- Hughes VA, Frontera WR, Wood M, et al. Longitudinal muscle strength changes in older adults: influence of muscle mass, physical activity, and health. *J Gerontol Biol Sci.* 2001;56A:B209-B217.
- Piers LS, Soares MJ, McCormack LM, O'Dea K. Is there evidence for an age-related reduction in metabolic rate? *J Appl Physiol.* 1998;85:2196-2204.
- Roubenoff R, Hughes VA. Sarcopenia: current concepts. *J Gerontol Med Sci.* 2000;55A:M716-M724.
- Dutta C. Significance of sarcopenia in the elderly. *J Nutr.* 1997;127:992S-993S.
- Fulle S, Protasi F, Di Tano G, et al. The contribution of reactive oxygen species to sarcopenia and muscle ageing. *Exp Gerontol* 2004;39:17-24.
- Beccafico S, Puglielli C, Pietrangelo T, Bellomo R, Fanò G, Fulle S. Age-dependent effects on functional aspects in human satellite cells. *Ann NY Acad Sci* 2007;1100:345-352.
- Hawkins SA, Marcell TJ, Jaque SV, Wiswell RA. A longitudinal assessment of change in VO2max and maximal heart rate in master athletes. *Med Sci Sports Exerc.* 2001;33:1744-1750.
- ACSM, *Med Sci Sports Exerc.* 1998;30(6):992-1008.

Neurorehabilitation as a part of the physical and rehabilitation medicine: the bulgarian tradition

I.B. Koleva

Clinic of Physical and Rehabilitation Medicine at the University Hospital, Pleven, Bulgaria

Department of Physical Medicine, Rehabilitation, Ergotherapy and Sports at the Medical University, Pleven, Bulgaria

The review presents the Bulgarian neurorehabilitation school: historical tradition, actual state-of-the-art, application of neurological assessment scales and of International Classification of Functioning, disability and health (ICF) in the functional evaluation of patients with neurological conditions, and the modern neurorehabilitation algorithms used in the clinical practice. A special attention is designated to the holistic approach to the neurological patient, application of therapeutic methods of different medical (neurology and PRM) and non-medical specialties (sociology, psychology, occupational /ergo/ therapy). In cases when proper synergetic combination of different types of physical modalities and between physical and drug therapy was provided, there were statistically significant favorable effects on motor weakness, coordination, grip, balance, gait, nociceptive and neuropathic pain, independence in activities of daily living, quality of life of patients. The complex neurorehabilitation stimulates functional recovery of patients with invalidating neurological diseases and ameliorates their autonomy, improving their health related quality of life.

References

American Academy of Physical Medicine and Rehabilitation Task Force on Medical Inpatient Rehabilitation Criteria (JL Melvin Chair). Standards for Assessing Medical Appropriateness Criteria for Admitting Patients to Rehabilitation Hospitals or Units, 2006 March. [Internet, cited 2008, March 6]. Available from: <http://www.aapmr.org/hpl/legislation/mirc.htm>

AOTA Council on Standards. Occupational therapy – its definition and function. *Am J Occup Ther.* 1972;(26):204-205.

DeLisa JA. *Physical Medicine and Rehabilitation – principles and practice.* 4th Edition. Philadelphia: Lippincott, Williams & Wilkins; 2005.

Dobkin B. Mechanisms for training-induced plasticity. In: *Abstracts Book of the 3rd World Congress in Neurological Rehabilitation;* 2002 April; Venice, Italy. Turin: Monduzzi editore; 2002. p.11.

Franchignoni F, Nardone A, Munoz Lasas S, Godi M. Clinical assessment of balance and mobility. In: *Proceedings of the 16th European Congress of*

Physical and Rehabilitation Medicine; 2008 June; Brugge, Belgium. Turin: Edizioni Minerva Medica; 2008. p.38-41.

Óleva I. *Physical analgesia and stimulation (with methods for neurological patients).* – Sofia: SIMEL Print, 2006, 180 p. [In Bulgarian]

Óleva I. – *ontemporary neurorehabilitation methods.* IId Edition. – Sofia: SIMEL Print, 2007, 462 p. [In Bulgarian]

Óleva I. *Medical Rehabilitation and Ergotherapy in neurologic and psychic diseases.* Manual for students of Medical Rehabilitation and Ergotherapy of the Medical University of Pleven and of Sofia University "Climent Ohridski". – Sofia: Publishing house SIMEL, 2009, 165 p. [In Bulgarian]

Óleva I. *Neurorehabilitation algorithms.* – Sofia: Publishing house SIMEL, 2008, 196 p. [In Bulgarian]

Óleva I. *Neurorehabilitation algorithms for functional recovery and amelioration of the quality of life of patients with socially important invalidating neurological diseases.* Thesis for the scientific degree "Doctor of medical sciences". – Sofia – Pleven, 2009, 360 p. [In Bulgarian]

Óleva I. *The Bulgarian Neurorehabilitation School and the International Classification of Functioning, Disability and Health (ICF): Integrating ICF requirements into clinical practice.* *Journal of Biomedical and clinical research.* 2009; 2(1): 8-18.

Stucki G, Cieza A, Melvin J. *The International Classification of Functioning, Disability and Health: a unifying model for the conceptual description of the rehabilitation strategy.* *J Rehabil med.* 2007; (39):279-285.

White Book on Physical and Rehabilitation Medicine in Europe. Produced by the Section of Physical and Rehabilitation Medicine, Union Européenne des Médecins Spécialistes (UEMS), the European Board of Physical and Rehabilitation Medicine and l'Académie Européenne de Médecine de Réadaptation in conjunction with the European Society of Physical and Rehabilitation Medicine (ESPRM). Gutenbrunner C, Ward AB, Chamberlain MA, Editors. *J Rehabil Med.* 2007;1(Suppl 45):S1-48.

Safety of Botulinum Toxin Among Patients Receiving Long-term Warfarin Anticoagulation Therapy.

Y. Jagatsinh, J. Macfarlane

????

Background. Botulinum toxin (BTX) has been a commonly used and effective treatment for spasticity in acquired brain injury since the early 1980s issues concerning technique, dose and long-term side effects remain unresolved¹. For example, whether using BTX safely in warfarinised patients is unclear. There are two data^{1,3}, confirming the risk of intramuscular injections in patients receiving anticoagulant therapy with regard to possible local haematoma formation. There is no advice on this subject in the manufacturers' summary of product characteristics for the original brand of warfarin, Dysport, Botox or in the British National Formulary. **Materials and methods.** 14 patients who were receiving anticoagulant therapy were given regular outline toxin injections with a 27 gauge needle in the upper and lower limbs as indicated in their treatment regime. Patients gave written informed consent before the injections. No extra measures were taken to avoid complications. Patients were assessed for obvious haemorrhage, resulting in swelling, bruising, tenderness or haematoma. Patients were asked for any adverse effect at the next follow up visit.

Results. Table I.

Table I. Patient demographics, INR at the time of injection and the muscles injection sites.

Patient	Age	Sex	INR	Injection sites	Local complications
1.	40	M	2.5	GM, TP	None
2.	74	F	2.8	GM, SL, TP,FDL, EHL	None
3.	66	F	2.6	PM, BC, BR, FDS	None
4.	49	M	1.2	GM, SL, FHL, FHB, TP, BC, BR	None
5.	63	F	2.4	BC, BR, FDS, FCR, FDP	None
6.	82	M	3.1	PM, LD, BC, BR, ADD	None
7.	61	M	2.9	BC, BR, FDS, FCR, FCU, GM, SL, TP	None
8.	82	M	3.1	PM, BC, BR, ADD, HS, EHL	None
9.	62	M	2.5	GM	None
10.	49	F	2.9	BC, BR, FCR, FDS, FDP, FPL, FPB, GM, TP	None
11.	62	M	2.5	BC, BR, FCR, FDP, FDS, FPL	None
12.	49	F	3.5	BC, BR, FDS, FCR, FDP	None
13.	78	M	2.6	BC, FDS, FDP	None
14.	51	F	2.8	ADD, Bil TP, Bil GM	None

Table: Abbreviations for muscles : LD-Lattissimus dorsi,PM-Pectoralis major, BC-Biceps, BR-Brachioradialis, FCR-Flexor carpi radialis, FDP-Flexor digitorum profundus, FDS-Flexor digitorum superficialis, FPL-Flexor pollicis longus,FCU-

Flexor carpi ulnaris, ADD-Hip Adductors, HS-Hamstrings, GM-Gastrocnemius, SL-Soleus, TP-Tibialis posterior, EHL-Extensor hallucis longus, FHL-Flexor hallucis longus, FHB-Flexor hallucis brevis

There was no reported adverse effect in any of these patients. There were no clinically detectable local complications after intramuscular injections and no major or minor bleeding episodes after BTX injections. **Conclusion.** BTX injections can be administered intramuscularly to patients who are receiving anticoagulant therapy without significant risk of local bleeding. However, injections must be used with caution in patients with an INR above the therapeutic range.

References

1. Aitken P, Bolton J. Intramuscular injections in the anticoagulated state. *Br J Psychiatry* 1995; 167:269.
2. British National Formulary. No 50, September 2005. British Medical Association and Royal Pharmaceutical Society of Great Britain, London.
3. Raj G, Kumar R, McKinney WP. Safety of intramuscular influenza immunization among patients receiving long-term warfarin anticoagulation therapy. *Arch Intern Med* 1995; 155:1529-31.

Intrathecal Baclofen: its effect on Symptoms and ADL's in severe spasticity due to Spinal cord injuries. A Pilot study

Yogendrasinh Jagatsinh

MBBS M S (Tr & Orth), MRCS Ed

Introduction. Spasticity is a major problem related to Spinal cord injuries. Use of Intrathecal Baclofen (ITB) with an implanted pump seems a very useful therapy mode in patients in whom oral agents are either not effective or produces intolerable side-effects. **Materials and Methods.** Twenty-four patients in the age range of 32-72 years (mean age of 50 years) had ITB pump implanted for the severe spasticity of spinal origin. The patients were followed up for average 22 months (range one to five years). **Results.** All 24 patients showed improvement in their spasms following the procedure. Improvement was noted in pain (12), sleep disturbance (20) and sphincter control (14). Patients had improvement in Activities of Daily Living like feeding ability (10), self care (10), indoor and outdoor mobility (19), and driving (4). One patient had catheter leakage immediately after the surgery and required change catheter. The radio telemetry allows very good adjustment of the dose according to the individual patients needs.

Table 1

Symptoms	Before ITB	After ITB
Pain	12	10 Improved 2 No change
Strength	16	9 Improved 6 No change 1 Worse
Co-ordination/Dexterity	18	17 Improved 1 Worse
Sleep	20	18 Improved 1 No change 1 Worse

Table 2

Activities of Daily Living	Before ITB	After ITB
Feeding Ability	10 (Rest of them were not able to feed themselves due to Tetraplegia)	8 Improved 2 No change
Hygiene and Self Care	10	9 Improved 1 No change
Dressing/Undressing	16	14 Improved to self dressing 2 No change
Bladder/Bowel Function	14	9 Improved 5 No change
Transfers	16	15 Improved 1 No change
Mobility (Indoors/Outdoors)	19	16 Improved 2 No change 1 Worse

Social/Recreational Activities	17	13 Improved 3 No change 1 Worse
Driving Ability	4	3 Improved 1 Worse

Conclusion. ITB improves the symptoms of spasm and also the quality of life and allows independence. Moreover it is reversible procedure & doses can be adjusted by radiotelemetry.

Medical rehabilitation and occupational (ERGO) therapy – an adjuvant medical specialty under the supervision of prm doctors: the bulgarian way

I.B. Koleva

Department of Physical Medicine, Rehabilitation, Ergotherapy and Sport at the Medical University of Pleven, Bulgaria

The review explores physiological and psychological bases of the human vital need (as an imperative part of Man's nature): the need to work and to be occupied however. Author explains a personal opinion about effective use of neuro-muscular and intellectual capacities, and individual productivity and creativity, like a determinant factor of the satisfaction of the effectuated work. Since the scholar year 2004/2005 in two Bulgarian Medical Universities (Sofia and Pleven) the education in "Medical Rehabilitation and Ergotherapy (MR&ET)" began. Author explains difficulties, obstacles and the atmosphere of controversy in the process of development of the medical specialty MR&ET. We give details about the Plan and Programmes of the specialty MR&ET like an adjuvant medical specialty; the graduates of which must to work in the rehabilitation practice under the supervision of doctors – specialists of Physical and Rehabilitation Medicine (PRM). We give a detailed evaluation of the impact of ergotherapy (occupational therapy) for stimulation of functional recovery and improvement of autonomy, respectively health-related quality of life in more than 1000 patients with invalidating socially important neurological conditions: post-stroke hemiparesis, multiple sclerosis, Parkinsonism; peripheral paresis. On the base of our own experience, some perspectives in the development of the rehabilitation in Bulgaria are strained.

Neurorehabilitation as a part of the physical and rehabilitation medicine: the bulgarian tradition

I.B. Koleva

Clinic of Physical and Rehabilitation Medicine at the University Hospital, Pleven, Bulgaria

Department of Physical Medicine, Rehabilitation, Ergotherapy and Sports at the Medical University, Pleven, Bulgaria

The review presents the Bulgarian neurorehabilitation school: historical tradition, actual state-of-the-art, application of neurological assessment scales and of International Classification of Functioning, disability and health (ICF) in the functional evaluation of patients with neurological conditions, and the modern neurorehabilitation algorithms used in the clinical practice. A special attention is designated to the holistic approach to neurological patient, application of therapeutic methods of different medical (neurology and PRM) and non-medical specialties (sociology, psychology, occupational /ergo/ therapy). In cases when proper synergic combination of different types of physical modalities and between physical and drug therapy was provided, there were statistically significant favorable effects on motor weakness, coordination, grip, balance, gait, nociceptive and neuropathic pain, independence in activities of daily living, quality of life of patients. The complex neurorehabilitation stimulates functional recovery of patients with invalidating neurological diseases and ameliorates their autonomy, improving their health related quality of life.

Valproate-induced lower extremity edema

Nural Albayrak Aydin¹, Tugra Yanik², Kamil Yazicioglu¹

¹Department of Physical Therapy and Rehabilitation, Guven Hospital, Ankara, Turkey

²Department of Neurology, Guven Hospital, Ankara, Turkey

Common causes of bilateral lower extremity edema are venous insufficiency, pulmonary hypertension, heart failure, idiopathic edema, lymphedema, drugs (calcium channel blockers, beta

blockers, clonidine, hormones, prednisone, anti-inflammatory drugs), premenstrual edema, pregnancy and obesity. Among these, valproate-induced lower extremity edema is seen very rare in our daily practice. To our knowledge, there are only three reports of valproate induced edema without hepatotoxicity have been published. We report the case of a 30-year-old woman who presented with severe edema induced by valproate sodium in her lower extremities without hepatotoxicity. In her physical examination there were no pathologic findings apart from severe pitting, non-erythematous mild tender edema of the legs. The circumference data obtained from tape measure measurements of her right ankle was measured 33cm and left ankle was 32cm before the treatment. Pretreatment to post-treatment changes in limb volume were determined using segment length of 4 cm starting from the lateral malleol extending up the leg. Laboratory tests showed normal liver function. Bilateral lower extremity venous doppler examination revealed no abnormalities. Levetiracetam monotherapy has started by neurology department after discontinuation of valproate sodium. Physical therapy treatment was initiated including intermittent pneumatic compression and manual lymph drainage for 15 sessions. In post-treatment evaluation, the circumference of her right ankle decreased to 28.5cm and left ankle was 28cm. In her 6-month follow up clinical examination; the circumference of her right ankle was 27.5cm and left ankle was 27cm. It is important to remember that patients receiving long-term valproate sodium may develop lower extremity edema at any level, and even though edema without hepatotoxicity is unusual, they must always be considered for ideal treatment decision.

Safety of Botulinum Toxin Among Patients Receiving Long-term Warfarin Anticoagulation Therapy.

Y. Jagatsinh, J. Macfarlane

Background. Botulinum toxin (BTX) has been a commonly used and effective treatment for spasticity in acquired brain injury since the early 1980s issues concerning technique, dose and long-term side effects remain unresolved¹. For example, whether using BTX safely in warfarinised patients is unclear. There are two data^{1,3}, confirming the risk of intramuscular injections in patients receiving anticoagulant therapy with regard to possible local haematoma formation. There is no advice on this subject in the manufacturers' summary of product characteristics for the original brand of warfarin, Dysport, Botox or in the British National Formulary. **Materials and methods.** 14 patients who were receiving anticoagulant therapy were given regular outline toxin injections with a 27 gauge needle in the upper and lower limbs as indicated in their treatment regime. Patients gave written informed consent before the injections. No extra measures were taken to avoid complications. Patients were assessed for obvious haemorrhage, resulting in swelling, bruising, tenderness or haematoma. Patients were asked for any adverse effect at the next follow up visit. **Results.** Table I.

Table I. Patient demographics, INR at the time of injection and the muscles injection sites.

Patient	Age	Sex	INR	Injection sites	Local complications
1.	40	M	2.5	GM, TP	None
2.	74	F	2.8	GM, SL, TP,FDL, EHL	None
3.	66	F	2.6	PM, BC, BR, FDS	None
4.	49	M	1.2	GM, SL, FHL, FHB, TP, BC, BR	None
5.	63	F	2.4	BC, BR, FDS, FCR, FDP	None
6.	82	M	3.1	PM, LD, BC, BR, ADD	None
7.	61	M	2.9	BC, BR, FDS, FCR, FCU, GM, SL, TP	None
8.	82	M	3.1	PM, BC, BR, ADD, HS, EHL	None
9.	62	M	2.5	GM	None
10.	49	F	2.9	BC, BR, FCR, FDS, FDP, FPL, FPB, GM, TP	None
11.	62	M	2.5	BC, BR, FCR, FDP, FDS, FPL	None
12.	49	F	3.5	BC, BR, FDS, FCR, FDP	None
13.	78	M	2.6	BC, FDS, FDP	None
14.	51	F	2.8	ADD, Bil TP, Bil GM	None

Table: Abbreviations for muscles: LD-Lattissimus dorsi,PM-Pectoralis major, BC-Biceps, BR-Brachioradialis, FCR-Flexor carpi radialis, FDP-Flexor digitorum profundus, FDS-Flexor digitorum superficialis, FPL-Flexor pollicis longus,FCU-

Flexor carpi ulnaris, ADD-Hip Adductors, HS-Hamstrings, GM-Gastrocnemius, SL-Soleus, TP-Tibialis posterior, EHL-Extensor hallucis longus, FHL-Flexor hallucis longus, FHB-Flexor hallucis brevis

There was no reported adverse effect in any of these patients. There were no clinically detectable local complications after intramuscular injections and no major or minor bleeding episodes after BTX injections. **Conclusion.** BTX injections can be administered intramuscularly to patients who are receiving anticoagulant therapy without significant risk of local bleeding. However, injections must be used with caution in patients with an INR above the therapeutic range.

References

1. Aitken P, Bolton J. Intramuscular injections in the anticoagulated state. Br J Psychiatry 1995; 167:269.
2. British National Formulary. No 50, September 2005. British Medical Association and Royal Pharmaceutical Society of Great Britain, London.
3. Raj G, Kumar R, McKinney WP. Safety of intramuscular influenza immunization among patients receiving long-term warfarin anticoagulation therapy. Arch Intern Med 1995; 155:1529-31.

The factors influencing the functional state recovery in cerebral stroke patients during inpatient rehabilitation

E. Milinavičienė¹, D. Rastenytė^{1,2}, A. Kriščiūnas³

¹Viršūžiglis Rehabilitation Hospital affiliated branch of Kaunas University of Medicine Hospital

²Kaunas University of Medicine, Department of Neurology

³Kaunas University of Medicine, Department of Rehabilitation

Introduction. Stroke is one of the most relevant public health issues due to high mortality and long-lasting disability rates around the world and in Lithuania (1). As a consequence, stroke patients stay with such functional disorders as motoric, self-care, and cognitive dysfunctions, that impair their social activities and life satisfaction (2). According to literature, complex rehabilitation improves functional status in stroke patients and life satisfaction (3). However, the recovery of functional status in stroke patients is different even if stroke diagnosis is the same. **Aim of the study:** to determine the factors influencing the recovery of the motor and cognitive functions and general functional state in cerebral stroke patients during the second rehabilitation stage, and their prognostic value. **Materials and methods.** The study included patients, who suffered the stroke and have undergone second stage rehabilitation at Viršūžiglis Rehabilitation Hospital (a branch institution of Kaunas University of Medicine Hospital). These were 226 subjects (109 men and 117 women), suffering ischemic or hemorrhagic stroke, who had stable health condition and were able to tolerate complex rehabilitation measures at least 3 hours a day. The average of the patients was 67.8±10.4 years. The largest part of the patients (88.5 %) were with cerebral infarction. The mean duration of rehabilitation was 38.8±8.9 days. The individualized rehabilitation programmes for stroke patients were accomplished by rehabilitation team: physical medicine and rehabilitation specialist (physician), physical therapist, occupational therapist, general nurse, psychologist, social worker, and speech therapist. The functional state of the patients was assessed by functional Independence Measure; the cognitive function, by the Mini Mental State Examination, the severity of the stroke, in accordance with the National Institutes of Health Stroke Scale. The effectiveness of rehabilitation was evaluated using FIM data, that describes patients independence in daily activities. The statistical analysis was conducted using statistical software „SPSS for Windows 13.0“ package. The prognostic value of the factors was evaluated by the logistic regression method. A study was performed on the influence of the patient's gender, age, social factors, clinical symptoms and signs, risk factors for stroke, co-morbidities, the character and localization of the stroke, and psychoemotional state on the recovery of capacities related to motor and cognitive functions, and restoration of general functional state. **Results.** During the second stage of rehabilitation, the score of the functional state of the patients assessed by the Functional Independence Measures significantly improved: from 65.9±20.3 to 93.5±20.9 (p<0.0001). At the end of rehabilitation, good efficacy of rehabilitation was determined in 64.2 per cent of rehabilitees; moderate, in 19.4 per cent; insufficient, in 16.4 per cent. In prognosing insufficient recovery of general functional state during the second stage of rehabilitation, a significant influence exerted on the results such factors as hemiplegia (OR=11.15, p<0.001), severe cognitive dysfunction (OR=15.18, p<0.001), urinary incontinence (OR=14.91, p<0.001), joint diseases (OR=5.52, p<0.05), and heart diseases (OR=4.10, p<0.05). On the insufficient recovery of capacities linked with motor function in the

second stage of rehabilitation, a significant influence had exerted unilateral neglect syndrome (OR=21.18, p<0.01), urinary incontinence (OR=10.93, p<0.001), severe cognitive dysfunction (OR=3.57, p<0.05), joint diseases (OR=11.03, p<0.001), and heart diseases (OR=4.19, p<0.05), whereas on the insufficient recovery of capacities related to cognitive functions a significant influence had exerted damage of left brain hemisphere (OR=4.32, p<0.001), dysphagia (OR=3.42, p<0.05), and urinary incontinence (OR=4.05, p<0.05). **Conclusion.** Insufficient efficacy of rehabilitation of rehabilitees with cerebral stroke in the second stage of rehabilitation was influenced by impairment of motor and cognitive functions, urination disturbances and co-morbidities.

References

1. Meairs S, Wahlgren N, Dirnagl U, Lindvall O, Rothwell P, Baron JC, et al. Stroke research priorities for the next decade - A representative view of the European scientific community. *Cerebrovasc Dis* 2006;22:75-82.
2. Paolucci S, Bragoni M, Coiro P, De Angelis D, Fusco FR, Morelli D, Venturiero V, Pratesi L. Is sex a prognostic factor in stroke rehabilitation? A matched comparison. *Stroke* 2006;37:2989-94.
3. Musicco M, Emberti L, Nappi G, Caltagirone C. Early and long-term outcome of rehabilitation in stroke patients: the role of patient characteristics, time of initiation, and duration of interventions. *Arch Phys Med Rehabil* 2003;84:551-8.

Effects of integrated care after primary implantation of hip and knee endoprosthesis

U.C. Smolenski¹, W.-D. Müller², P.Bak¹, S.Heinle¹, U. Irlenbusch³

¹Institut für Physiotherapie, Universitätsklinikum Jena

²m & i Fachklinik Bad Liebenstein

³Marienstift Arnstadt

Background. Multidisciplinary inpatient rehabilitation is usual care in Germany after total arthroplasty. The aim of this study was to assess the effects of integrated care strategy after implantation of hip (THA) or knee (TKA) arthroplasty in terms of their health-related quality of live and functional status. **Materials and methods.** Prospective observational study comparing the outcomes of integrated inpatient and outpatient rehabilitation in 57 patients following total hip and 40 patients following total knee arthroplasty (mean age 65.5 years). The primary outcome measures were SF-36, WOMAC and EQ-5D which were self-administered on admission, at discharge and 3, 12 and 18 months after discharge. Longitudinal changes as well as group differences for every point of assessment were computed. For statistical analyses we computed mean values and means of effective thickness for all different time points, each for the whole group as well as for the subgroups. **RESULTS:** We found considerable deficits in general (SF-36, EQ-5D) and specific health status (WOMAC) before surgery. Positive longitudinal changes with moderate to large effect sizes were observed for all outcome measures in both groups. There were significant differences between patients with hip arthroplasty and patients with knee arthroplasty, whereby patients with osteoarthritis of the hip show performed better especially at the end of the rehabilitation process. In summary, both groups profited from surgery as well as from rehabilitation. **Discussion.** Our study had limitations. The samples were too small to allow generalisation of the results. However, our study shows that integrated care does improve function and participation in these two patient groups. It is an interesting result that patients with osteoarthritis of the knee do not improve as much as patients with osteoarthritis of the hip do. Many other co-variables as BMI, co-morbidities, sex and weight bearing could have confounded results. These seem to be in concordance with the literature showing better outcomes in the THA group at discharge as compared with the TKA group. **Conclusion.** THA and THK represent two different states in terms of functional health. Therefore, flexibility in integrated therapy and rehabilitation is required to achieve comparable functional outcomes. Further research is needed to investigate whether different timing, different intensity or different rehabilitation strategy could further improve the outcomes of rehabilitation after THA and TKA.

The mirror therapy in the rehabilitation of lower limb amputation: is there any contraindication?

????
 ????

Introduction. Mirror box therapy and its development (immersive virtual reality) is used in pain therapy and in rehabilitation of

people with amputation affected by phantom limb-related phenomena. It allows patients to view a reflection of their anatomical limb in the visual space occupied by their phantom limb. There are only limited reports of its possible side effects. **Design.** We retrospectively reviewed the existence of side effects or adverse reactions in a group of 33 non selected patients with phantom limb-related phenomena. **Results.** Nineteen reported confusion and dizziness, 6 reported a not clearly specified sensation of irritation and 4 refused to continue the treatment. Only 4 of the 33 patients did not have any complaints. **Conclusion.** Possible reactions for this large number of side effects could be the lack of selection of patients and the fact that the mirror box therapy was paralleled by a conventional rehabilitation approach targeted to the use of a prosthesis. Warnings on the need to select patients, with regard to their psychology as well as clinical profile (including time from amputation) and possible conflicting mechanisms between box therapy and conventional therapies are presented.

References

1. Ramachandran VS. Plasticity and functional recovery in neurology. *Cl.Med.* 2005;5:368-73.
2. Mac Lachlan M et al. Mirror treatment of lower limb phantom pain. A case study. *Dis Rehabil.* 2004;26:901-4.
3. Murrey CD et al. Immersive virtual reality as a technology for phantom limb experience: a protocol. *Cyberpsychol Behav* 2006;9:167-170 B
4. Chan BI et al. Mirror therapy for phantom limb pain. *N Engl J Med.* 2007;357:2206-7.
5. Mayer A, et al. Body schema and body awareness of amputees. *Prosthet Orthot Int* 2008;1:1-20.
6. Casale R, Damiani C, Rosati V. Mirror therapy in the rehabilitation of lower limb amputation. *Americ J of Phys Med and Rehabil;* October 2009;837-842.

Non-specific Chronic low back pain patients are deconditioned and have an increased body fat percentage.

AP. Hodselsmans¹, PU. Dijkstra², JHB. Geertzen², CP. van der Schans¹

¹Hanze University Groningen Applied science, Research and Innovation Group in Health Care and Nursing

²Department of Rehabilitation Medicine, Centre for Rehabilitation University Medical Centre Groningen, University Groningen

Introduction. As a result of a long-term reduction in levels of activity, a 'deconditioning syndrome' has been proposed to describe non-specific chronic low back pain (CLBP) patients. Despite the deconditioning theory, it is not clear whether non-specific CLBP patients actually suffer from a reduced aerobic capacity. **Aim.** The aim of this cross-sectional study was to compare data on the level of aerobic capacity and body composition of non-specific chronic low back pain (CLBP) patients with normative data matched for gender, age and level of sporting activity. The second aim was to analyse the association between the level of aerobic capacity and the duration of complaints. **Materials and methods.** The study population consisted of 101 outpatients with non-specific CLBP who had entered a rehabilitation program. A lean body mass (LBM)-based Åstrand sub maximal bicycle test was used to estimate maximum oxygen consumption (VO₂ max). Body fat percentage was estimated according to the Durnin and Womersley protocol using a skin fold calliper. **Results.** The mean (sd) aerobic capacity (VO₂ max) of CLBP patients was significantly (P < 0.001) lower 7.3 (5.6) ml/kg LBM * min⁻¹ and the mean (sd) body fat percentage was significantly (P < 0.001) higher 3.9 (5.9) % as compared to the norm data. The effect size (ES) between the observed and the predicted VO₂ max was considerable (ES = 0.88) and between the observed and predicted body fat percentage was moderate (ES = 0.55). No significant relation was found between aerobic capacity and the duration of complaints. **Conclusion.** These results provide evidence of a reduced level of aerobic capacity and an increased body fat percentage in non-specific CLBP patients compared to healthy subjects. Secondary, we could not confirm that chronicity contributes to deconditioning.

Orthosis management in patients with poliomyelitis

B. Bocker, C. Hölig, U.C. Smolenski

Institute for Physiotherapy of the University-Clinicum of Friedrich-Schiller-University

Between 50.000 and 110.000 patients in Germany suffer from the consequences of Poliomyelitis anterior acuta. The clinical presentation after recovery from the acute phase of the disease exhibits neuromuscular stability with potential residual paralysis and can be followed by the state of Post Poliomyelitis with a loss of strength of

approx. 1 % per year up to 15 % in 8 years. Clinical signs typically seen in the lower limb are hyperextension of the knee joints, varus or valgus malalignment, disturbances of growth with shortenings of the leg and limping gait, weakness of the dorsal flexors of the foot and – resulting from this – instability in gait and standing with a higher risk of falls. A femoral orthosis is supposed to improve this impaired function of the lower limb by stabilizing and releasing strain on the muscles, so that the patients' pain should be eased distinctly and mobility and independence in activities of daily life should increase notably. The object of the present study is to examine to what extent an orthosis unburdens the overstrained musculature, improves the functionality of the lower limb and the activities of the daily life. **Materials and methods.** We examined 4 patients with paralysis of the lower limb. If clinically indicated and after having been examined via gait analysis, the patients were treated with a femoral Carbonfaserorthosis. **Inclusion criteria.** Clinical paresis of the lower limb with partial paralysis of the quadriceps muscle and weakness of the dorsal flexors of the foot with muscle strength grade 0-3; shortening of the leg < 3 cm; instability of the knee joint: decentralisation of the patella, hyperextension of the knee joint while standing, varus or valgus misalignment **Exclusion criteria.** Secondary disease with other gait disorder; ankylosis in the leg with orthosis; inability to walk. In a mean of 5 months (3-8) before and 3 month (1-4) after getting the orthosis and being rehabilitated with gait training the efficiency of the treatment was assessed by surface EMG the following muscles: vastus medialis and lateralis, rectus femoris, biceps femoris, gluteus medius, external and internal abdominal oblique and the multifidus muscle while standing and walking as well as the kinematic gait analysis with the duration of the stance phase and the knee joint angle during walking **Results.** On that side of the body, which has got no orthosis, the Friedman-test detected significant statistical changes of the EMG values of the mean amplitudes of the trunk muscles (external and internal abdominal oblique and gluteus medius muscle) during standing. While walking we observed changes in the mean values of the amplitude of three of the thigh muscles (vastus medialis and lateralis, biceps femoris muscle) and the external abdominal oblique muscle. The same tendency was seen at that side of the body which was treated with orthosis. On the opposite side we found changes of the multifidus muscle. In the kinematic gait analysis. The knee joint angles showed differences in the leg with the orthosis of 20°, but there were no significant changes in the duration of the stance phase. **Conclusion.** The decisive factor should be the recovery of stability in standing and therefore prophylaxis of falls as well as a neuromuscular economisation of the activity of trunk and lower extremity.

The impact of body image disturbance on rehabilitation program in lower limb amputees: a pilot study

????
?????

Introduction. Amputee gait training with prosthesis seems to be greatly correlated to a disturb of the self body image because of limb loss and phantom pain syndrome .In the literature this correlation is still undetected. The aim of this monocentric pilot study is to verify and quantify the self body image disturbance.It's important also to verify the impact of self body image disturbance on rehabilitation program in these patients, such as adaptament to the prosthesis, anxiety and depression. **Materials and methods.** 33 inpatients were enrolled in this experimental study.All group participated in a conventional amputee rehabilitation program. Inclusion criteria:lower limb amputation Exclusion criteria: non-collaborative patient;serious cognitive impairment;central nervous system disorders; severe comorbidities. Main outcome measures: FIM, MMSE, ABIS,TAPES ,MPQ,CES-D,STAI-Y performed at the beginning and at the end of the rehabilitation program. **Results.** All patients have a grat functional improvement.There is a strong negative correlation between the self body image disturbance and general and social adaptament to the prosthesis.There is a strong positive correlation between body image disturbance and state and trait anxiety and depression. **Conclusion.** This study shows the importance of a specific rehabilitation program.In particular we can observe the need of an earl and appropriate prosthization for reconstruction of the correct self body image .

References

H. Flor; Phantom-limb pain: characteristics, causes, and treatment; da Lancet Neurology 2002;1:182-189.
G. N. Davidoff, R. Lampman, L. Westbury; Exercise Testing and Trainig of Persons with Dysvascular Amputation: Safety and Efficacy of Arm Ergometry; Arch Phys Med Rehabil 1992;73.

M.MacLachlan, D. McDonald, J. Waloch; Mirror tratment of lower limb phantom pain:a case study; Disability and Rehabilitation, 2004; vol.26
A. Alesi, C. Damiani, D. Pernice; Europa TAPES (Trinity Amputation and Prothesis Experience Scales): traduzione e adattamento italiani-fase preliminare Medicophysica Vol. 40 Suppl.1 to N. 3 pag. 653-654
Ramachandran VS, Stewart M, Rogers-Ramachandran DC. The presence of ineffective Synapses and the circumstances which unmask them. Phil R Soc Lond B 1992;278; 361-372
Sherman RA, Sherman CJ, Bruno GM. Psychological factors influencing chronic phantom limb pain: an analysis of the literature. Pain 1987;28(3):285-95.
Fredericks JAM. Phantom limb and phantom limb pain. In: Frederiks JAM (Ed.). Handbook of Clinical Neurology. Vol. 45. Amsterdam: Elsevier Science Publishers, 1985. p. 395-404.
C.D. Murray, J. Fox, Body image and prosthesis satisfaction in the lower limb amputee, Disability and Rehabilitation – 2002, Vol.24, N. 17, pp. 925-931
Makoto, T. Obayashi, T. Toyonaga, Association of Pain With Employment Status and Satisfaction Among Amputees in Japan, Arch Phys Med Rehabil – Ottobre 2003, Vol. 83, pp. 1394-1398.

Isokinetic measurement of distal leg muscle strength and endurance,before and after a rehabilitation programme for patients with chronic arterial occlusive disease

????
???

Introduction. Rehabilitation and exercise training are known to constitute an effective treatment for chronic arterial occlusive disease at the intermittent claudication (IC) stage (1,2). Improved functional capacity and quality of life have been reported (2). We decided to assess the effect of hospital-based exercise training on the strength and endurance of the ankle plantar and dorsal flexors in this patient population.**Materials and methods.** In a prospective study, 31 subjects with chronic arterial disease and IC were included in a 4-week, prospective rehabilitation programme featuring walking sessions, selective muscle strengthening, general physical activity and patient education. An isokinetic assessment of the ankle plantar and dorsal flexor strength was performed on the first and the last days of the programme. We chose to study concentric contractions at 30°/s and 120°/s for the strength measurement and at 180°/sec for the fatigue test. We also measured the walking distance. **Results.** Walking distance improved by 246%. The pre-rehabilitation isokinetic assessment revealed severe weakness (mainly of the plantar flexors). The only isokinetic parameter which improved during the programme was the peak plantar flexor torque at 120°/s. **Conclusion.** All patients presented with severe weakness and fatigability of the ankle plantar and dorsal flexors. Our programme dramatically improved walking distance, but not muscle strength and endurance (at least as assessed in a concentric mode with an isokinetic dynamometer).

References

1. HAS Recommendations pour la pratique clinique : Prise en charge de l'artériopathie chronique oblitérante athéroscléreuse des membres inférieurs (indications médicamenteuses, de revascularisation et de rééducation). 2006.
2. Spronk S, Bosch JL, den Hoed PT, Veen HF, Pattynama PM, Hunink MG. Intermittent claudication: clinical effectiveness of endovascular revascularization versus supervised hospital-based exercise training—randomized controlled trial. Radiology. 2009 Feb;250(2):586-95.

Effectiveness of Hallux Valgus Strap; a prospective, randomized single-blinded controlled trial

C. Chueluecha¹, N. Chadchavalpanichay²,
¹Department of Rehabilitation Medicine, Faculty of Medicine Thammasat Hospital, Thammasat University, Thailand
²Department of Rehabilitation Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Thailand

Introduction. Hallux valgus is a common disorder of the forefoot and the most common pathologic condition involving the great toe. One of the leading problems that brought the patient to the physician was the need to correct their hallux valgus deformity. To solve this problem, surgical correction was the best choice. For the one who did not want to get surgery and expected only stop or decrease the progression of hallux valgus deformity, conservative treatment were suggested such as using a proper shoe with wide and depth toe box or a shoe that modified for the deformity. Many types of orthotic devices were prescribed such as toe separators, total contact insoles and hallux valgus straps. Night time commercial hallux valgus strap was one of orthotic devices that commonly prescribed.

Many literatures reported the good results of orthotic devices in decreasing foot pain and prevent recurrent hallux valgus deformity after surgical correction. But no one reported the effectiveness of night time commercial hallux valgus strap in decrease the progression of hallux valgus deformity. **Objectives.** *Primary objective.* To study the effect of night time hallux valgus strap usage in decreasing the progression of hallux valgus angle. *Secondary objective.* To study the effect of night time hallux valgus strap usage in decreasing forefoot pain. **Designs.** A prospective, randomized single-blinded controlled trial. **Setting.** Out patient Rehabilitation clinic, Siriraj Hospital, Mahidol University, Thailand. **Population.** The patient who was more than eighteen years old with moderate to severe degree of hallux valgus. **Materials and methods.** Patients were random into 2 groups, the intervention group (using night time hallux valgus strap for 8 hours per night) and the control group. Patients in both groups were given a conventional treatment including proper foot care and proper shoe. **Results.** There were 25 patients in intervention group and 22 patients in control group. No statistical difference was found in demographic data between both groups. The hallux valgus angle between the 0, 6, 9 and 12 months in both intervention and control groups were decreased but no statistic difference significant. Pain intensity on a numeric rating scale at 0, 3, 6, 9 and 12 months were decreased in both intervention and control groups but no statistic difference significant between both groups. **Conclusion.** No statistically significant difference in decreasing of hallux valgus angle and pain intensity between the intervention group and the control group.

Dietary intakes in people with chronic spinal cord injury: An analysis by obesity and injury related variables

Hadis Sabour¹, Abbas Norouzia Javidan¹, Mohammad Reza Vafa², Farzad Shidfar⁰, Hooshang Saberi¹, Abbas Rahimi¹, Hasan Emami Razavi¹

¹Nutrition Research Group, Brain and Spinal Injury Repair Research Center, Imam Hospital, Tebran University of Medical Sciences, Tebran, Iran

²Health and Nutrition Department, Iran University of Medical Science, Tebran, Iran

Introduction. Despite an elevated obesity and CHD risk in people with spinal cord injury (SCI), a detailed investigation of calorie intakes and dietary composition that also examines the effects of age, obesity predictors, completeness and level of injury is yet to be unknown within the SCI population. **Material and methods.** The objectives of this study were to assess dietary intakes in people with SCI according to anthropometric and injury related variables and to compare their dietary intakes with national guidelines. **Results.** In this cross-sectional study 162 people with chronic (SCI) and the mean age of 34.17±0.69 years participated. Dietary intakes were assessed by means of a semi quantitative food frequency questionnaire. Men (n=131) had higher total energy and carbohydrate intake (p<0.05) compared to women (n=31). Men with paraplegia had higher BMI than women (p=0.009). Significant correlations were found between both BMI and Waist circumference with age (r = 0.2 and r 0.17, respectively; p<0.05). Age, education and gender were more important significant predictors for total calorie intake. Marriage was the only significant predictor for dietary fat and poly unsaturated fatty acid, whether expressed as grams or as a percent of total calories. **Conclusion.** Macronutrient balance is shifted towards saturated fat intake in a substantial percentage of the participants. Significant positive relationship was found between level and completeness of injury and obesity. The elderly and individuals with longer time since injury tended to maintain healthier diets. The majority of the population was at the risk of obesity like the general population in our country, especially in women.

Sympathetic Skin Response in Rheumatoid Arthritis

M.J. Hadianfard, A.R. Ashraf, M.F. Emad, A. Tajziehchi, M.A. Nazarinia
Physical Medicine & Rehabilitation Department, Research Bone and Joint Disease Center, Shiraz University of Medical Sciences (SUMS), Shiraz, Iran.

Introduction. Peripheral neuropathy (PN) occurs in 1% to 10% of patients with Rheumatoid arthritis (RA). Autonomic neuropathy in RA may lead to increased morbidity and mortality but few reports exist in this subject. **Materials and methods.** Sixty adult patients

who fulfilled the American Rheumatism criteria for RA were evaluated in this study. Exclusion criteria were diabetes mellitus, thyroid disease, drug consumption affecting the autonomic nervous system and any type of peripheral neuropathy. Sixty healthy apparent subjects matched for age and sex were selected as control group. Sympathetic Skin Response (SSR) of the median and the tibial nerves were taken with standard method. Latency of SSR was measured from the stimulation artifact to the first deflection from the baseline. Three recordings were performed for each nerve and average responses were used for analysis. **Results.** The youngest patient was 30Y/O and the oldest was 73Y/O. The mean duration of disease was 8(±6.2) years. We considered a response as abnormal when it was absent or its latency was more than mean +2SD of the control group. In the case group, SSR was abnormal in 98(81%) of 120 tested median nerves compared to 21(17.5%) of 120 in the control group and it showed a statistically significant difference between the two groups (p<0.001). In the case group, SSR was abnormal in 112 (93.3%) of 120 tested tibial nerves compared to 24(20%) in the control group and it showed a statistically significant difference between the two groups (p<0.001). Seven patients had clinical dysautonomia (Two males had impotence, 3 had hypohydrosis and 2 had positional vertigo due to orthostatic hypotension). Two of them had normal SSR responses and only one of them had absent SSR response. We did not find any correlation between clinical dysautonomic syndrome and abnormal SSR in RA patients. **Conclusion.** Autonomic neuropathy must be remembered and investigated as a risk factor causing morbidity and mortality in patients with RA.

Diagnostic and Therapeutic Concepts in CMD from the aspect of manual medicine

U.C. Smolenski, B. Bocker, R. Bocker

Institute for Physiotherapy, University Hospital Jena

Background. Craniomandibular dysfunction (CMD) stands for several musculoskeletal disorders involving the masticatory system. Concerning classification, a subdivision is useful according to the "Research Diagnostic Criteria for Mandibular Disorders": somatic diagnoses – pain related psychosocial diagnoses – generalization. With a valence of 75% in lifetime, a morbidity of 8% of the population, and an age of onset in an employed age period, diagnostics and therapy are important for the patient as well as for the therapeutic strategy. Diagnostics is complicated by the variety of causes and symptoms. **METHODS:** Starting from the triad: temporomandibular joint - occlusion – muscles, connected via neurophysiologic control, the issues anatomy, muscular apparatus, sensorimotor function and neurophysiologic connections are addressed in the paper. The craniomandibular system is presented to be more than just a masticatory system. As a system in the sense of an oral-spatial function, it requires an interdisciplinary approach. A diagnostic and therapeutic approach is offered by the concept of manual medicine: case history, clinical and manual medical examination, device-based function tests and assessments. These are presented at their status quo. Results of studies of the reliability and validity of several clinical as well as of device-based methods are addressed. Correlations between different ICF oriented levels are demonstrated: structure/function, activity, participation. For clinical daily routine, an examination programme is presented, which has stood the test in the lecturer's institution. Starting from the results of clinical examination and the assessment of instrumental procedures, the different therapeutic levels are discussed and their possibilities are presented: manual therapy, physical therapy, relaxation therapy, drug therapy, dental therapy and psychotherapy.

Muscular Backgrounds of Motion Control

U.C. Smolenski, B. Bocker, A. Reuter, N. Schwarz

Institute for Physiotherapy, University Hospital Jena

Background. In the present study evaluation methods, their results and reliabilities in the examination of muscular functions in motion control/stereotype motions according to JANDA (arm abduction, hip abduction, hip hypertension, trunk mobility) are checked. **Materials and methods.** Two methods are compared: visual examination and measurement of muscular function using an 18-channel-surface-EMG (OEMG) with innovative/latest evaluation software. A random sample of n=20 test persons were examined. To assess the reliability of the measuring procedure, we tested the intrasession reliability of the OEMG, the intersession reliability of the OEMG by

test – retest, and the validity of the OEMG by comparison with visual assessment. Main attention is focussed on the succession of activation of different muscle groups, within the chain of the respective motion control. **Conclusion.** Aim is a clinical presentation of the succession of activation and a determination, which method is more appropriate for a reliable examination under everyday conditions and how reliably stereotype is assessed.

Static stabilometry in the evaluation of the correlation and significance of different variables: length of the track, area subtended, age, height, weight and foot length.

R. Schiffer¹, F. Scoppa²

¹Professor, Master degree course in Posturology

²Ph.D. in Neuroscience, Scientific Coordinator and Professor, Master degree course in Posturology, Department of Neurology and ORL, First Faculty of Medicine and Surgery, Sapienza University of Rome Laboratory of Biometry and Digitalised Posturology, Optoelectronic Hospital, Cuneo

Department of Neurology and ORL, First Faculty of Medicine and Surgery, Master degree course in Posturology, Director: Prof. Amabile, Giuseppe A., Sapienza University of Rome, Italy

Objective and design. This study has been conducted to evaluate the association rate (Pearson's r) and the significance (p-value) between two instrumental variables detected by static stabilometry. These variables are: the length of the track (Lt) and the area subtended (As), and other four anthropometric variables such as age, height, weight and foot length. **Setting.** To reach this objective we have evaluated 268 patients, 112 of whom were men and 156 were women; the maximum age was 87, the minimum was 14, and the average was 60.1. **Results and conclusions.** The results pointed out that the positive association rate was very strong and significant, i.e. not linked to chance, only between the area subtended and the length of the track, both with open and closed eyes, with r values ranging between 0.95 and 0.99. On the contrary, the other tested variables such as age, height, weight and foot length, always in relation to Lt and As, showed very weak association rates, linked to chance or not. Further studies are necessary to confirm this outcome.

References

1. Hu XY, Yao HF, Lin JH., Fa Yi Xue Za Zhi. Comprehensively analysis: the correlation between the height of a person and the length of his/her handprint. 2004; 20(4):208-11. Chinese.
2. Bauer C, Gröger I, Rupperecht R, Gassmann KG. Intrasession reliability of force platform parameters in community-dwelling older adults. Arch Phys Med Rehabil. 2008 Oct; 89(10):1977-82.
3. Błaszczyk JW. Sway ratio - a new measure for quantifying postural stability. Acta Neurobiol Exp (Wars). 2008; 68(1):51-7.

Investigation of the relationship between osteoporosis and sexual satisfaction in women

Alireza Ashraf¹, Behrouz Kazemi¹, Masuod Musavinasab², Parisa Sedaghat¹, Somayeh Dayaghi¹

¹Department of Physical Medicine and Rehabilitation, Shiraz University of Medical Sciences, Shiraz, Iran

²Department of Psychiatry, Shiraz University of Medical Sciences, Shiraz, Iran

Introduction. Previous studies indicated that women with sexual dissatisfaction are more prone to depression. Some other investigations also showed there is a relation between depression and osteoporosis, but there is not any research which directly investigated the relation of these two factors. Hence we decided to find any direct relation between these two factors. **Materials and methods.** The case group consisted of 53 menopausal women (21 with osteoporosis and 32 with osteopenia) and 53 premenopausal women (37 osteoporotic, and 16 osteopenic). In control group there were 53 menopausal women, and 53 premenopausal women who had normal bone density. Sexual satisfaction in both groups was assessed by standard Larson's sexual satisfaction questionnaire and bone density was investigated by Dual-energy x-ray absorptiometry (DEXA). **Results.** Menopausal women significantly had less sexual satisfaction in comparison with whom that were not menopausal, $F = 74.62 - P < 0.001$ (variance analysis). Osteoporotic women significantly showed less sexual satisfaction, $F = 17.20 P < 0.001$ (variance analysis). It means that the main effect of 2 variables (osteoporosis and

menopause) is significant. Osteoporotic women significantly reported less sexual satisfaction in comparison with the two groups of healthy women ($D = 12.84 P < 0.001$) and osteopenic women ($D = 7.93 P < 0.002$) (Scheffe test). Osteopenic women also had less sexual satisfaction in comparison with healthy women ($D = 4.90 P < 0.016$). **Conclusion.** This study suggests that there is a relation between bone loss and sexual satisfaction in women. Therefore, this correlation, suggests the importance of quick diagnostic investigation and the management of osteoporosis in women with sexual dissatisfaction.

Behavioural deficits following traumatic brain injury.

M. Lippert-Grüner

Medizinische Fakultät der Universität zu Köln, Köln; Germany

Introduction. Debilitating neurobehavioural sequelae often complicate traumatic brain injury (TBI). Cognitive deficits, particularly of attention, memory, information processing speed and problems in self-perception, are very common following severe TBI. **Materials and methods.** The Neurobehavioural Rating Scale (NRS) is a multi-dimensional clinical-based assessment instruments designed and validated to measure neurobehavioural disturbances following TBI. This study examined 41 patients after severe TBI. All 27 items of the NRS were assessed 6 and 12 months post-injury. **Results.** Subjects after severe TBI as reflected in the initial GCS had higher overall scores on the NRS, reflecting the higher overall neurobehavioural dysfunction. NRS items did not change significantly between 6 and 12 months post-trauma for anxiety, expressive deficit, emotional withdrawal, depressive mood, hostility, suspiciousness, fatigability, hallucinatory behaviour, motor retardation, unusual thought content, liability of mood and comprehension deficit. There was a tendency of improvement for inattention, somatic concern, disorientation, guilt feelings, excitement, poor planning and articulation deficits. For conceptual disorganization, disinhibition, memory deficit, agitation, inaccurate self-appraisal, decreased initiative, blunted affect and tension even a tendency for further deterioration in the post-traumatic follow-up was detected. Changes between 6 and 12 months post-TBI were statistically significant for disorientation (improvement), inattention/reduced alertness (improvement) and excitement (deterioration). **Conclusion.** The data shows that neurobehavioural deficits after TBI do not show a general tendency to disappear over time but even get worse in the time course. Some aspects related to self-appraisal, conceptual disorganization and affect may even deteriorate, thereby presenting a challenging problem for both the patients and relatives. This is in contrast to the parallel improvement of post-traumatic sensorimotor deficits.

Acute rehabilitation in the neurosurgical intensive care (Pilot study)

M. Lippert-Grüner

Medizinische Fakultät der Universität zu Köln, Köln; Germany

Introduction. Immediate and systematic applications of adequate rehabilitation are the most important factors for restitution of impaired brain function. Integration of these applications in the intensive care makes it possible to start rehabilitation therapy directly, without any interruption. The aim of the study was to investigate the efficiency of early rehabilitation program beginning at the neurosurgical intensive care unit. **Materials and methods.** In the prospective study, 29 patients (age 55.8, range 43-89 years, m : f = 1 : 1) surviving the brain injury were investigated. Early rehabilitation program started if the patients have no need of sedation, after stabilisation of cardiopulmonary functions and normalization of ICP. Early rehabilitative treatment lasted mean 19.8 (7-48) days. Therapy was adapted to the individual capability and was performed for 300 minutes each day. For the income and outcome evaluation we used the Early Reha Barthel Index (ERI). Here have been introduced aspects of functional deficits relevant in early rehabilitation patients to the Barthel Index in a separate section: state requiring temporary intensive medical monitoring, tracheostoma requiring special treatment (suctioning), intermittent artificial respiration, confusional state requiring special care, behavioural disturbances requiring special care, swallowing disorders requiring special care, and severe communication deficits. **Results.** At the time of income to the rehabilitation program, the ERI was at mean -136.2 points (range -225 - +20 points), 18 of the patients had ERI of -175 points or less. At the time of discharge, the ERI reached at mean +0,34 points (range -225 -

+100 points), 10 patients (one third) reached +80 points or more and were in the activities of daily living nearly independent. Only 6 patients reached only the ERI of -175 points or less. **Conclusion.** The results of this project show, that already during intensive care treatment an efficient early onset rehabilitative therapy is possible. In summary we conclude that by integration into the acute clinic, complications can be treated more adequately and delays with negative consequences for the patients can be avoided. If early rehabilitation therapy can practically be established in the most of the acute units is widely depending on the future development in health-politics.

Comparison of Padua Inventory score between the patients with carpal tunnel syndrome and general population

Somayeh Dayaghi¹, Alireza Ashraf¹, Ahmad Ghanizadeh², Mohammad hossein Ashraf¹

¹Department of Physical Medicine and Rehabilitation, Shiraz University of Medical Sciences, Shiraz, Iran

²Department of Psychiatry, Shiraz University of Medical Sciences, Shiraz, Iran

Introduction. Carpal tunnel syndrome (CTS) is the most common type of peripheral nerve entrapment. The risk of CTS is high in occupations involving exposure to high pressure, high force, and repetitive works of hand. As the patients with obsessive-compulsive disorder (OCD), have repetition in their habits, it has been suggested that OCD patients may be more involved with CTS, and in CTS patients obsession may have considerable prevalence. This study was performed in order to compare the score of Padua Inventory between the patients with CTS and non-CTS persons and also to determine the score between various grades of CTS. **Materials and methods.** One hundred and three definite CTS-patients and 105 participants without any signs and symptoms of CTS with similar age and sex from general population were selected. Padua Inventory questionnaire was filled out between these two groups. **Results.** The mean of Padua Inventory score in CTS-patients was 44.75 (SD=14.69) and in non-CTS participants was 44.86 (SD=13.46). There was no significant statistical difference between these two groups. **Conclusion.** In this study the mean of the Padua Inventory score is 44.75 in CTS-patients and is within the range of general population. Therefore, it has been suggested that OCD may be not more common in the CTS patients.

Evaluation of the bone density of the femur in the patients with unilateral knee osteoarthritis

Alireza Ashraf, Nosratollah Azhdarnia, Mohammad Javad Hadianfard, Mohammad Reza Emad, Sharareh Roshanzamir

Department of Physical Medicine and Rehabilitation, Shiraz University of Medical Sciences, Shiraz, Iran

Introduction. Nowadays, osteoporosis and osteoarthritis have been recognized as two prevalent diseases in the world. This study was designed for evaluating the relation between these two diseases in patients with unilateral knee osteoarthritis. **Materials and methods.** Forty three patients with unilateral knee osteoarthritis were selected. The demographic data and the result of Dual X-Ray Absorptiometry (DXA) were recorded. **Results.** Thirty two patients (74.4%) were female and 11 patients (25.6%) were male. Twenty patients (46.5%) were suffering from osteoarthritis of the right knee and 23 patients (53.5%) were suffering from osteoarthritis of the left knee. In paired t-test, the total T score, Z score and T score in the neck of right femur in comparison with the left femur in patients with the right knee osteoarthritis were: $t=-7.05, p<0.001$; $t=-7.78, p<0.001$ and $t=-2.58, p<0.02$ respectively. Also, the total T score, Z score and T score in the neck of the left femur in comparison with the right femur in patients with the left knee osteoarthritis were: $t=-7.59, p<0.001$; $t=-5.2, p<0.001$ and $t=-5.2, p<0.001$ respectively. **Conclusion.** Patients with unilateral osteoarthritis usually have a relatively lower femoral bone density in the same side. Therefore, we suggest that the hip of the side with symptomatic unilateral knee osteoarthritis should be measured in DXA test.

Life quality related management possibilities of metastatic bone fractures diagnosis and therapy

D. Nemes^{1,2}, D.V. Poenaru^{1,3}, O. Drira³, M. Dragoi^{1,2}, E. Amaricai¹, D. Popa¹, L. Catan¹, D. Surducan¹, H. Vermesan^{1,3}, D. Vermesan^{1,3}, R. Prejbeanu^{1,3}, O. Suci¹, R. Onofrei¹, C. Milicin¹, G. Puenea¹, C. Galai², C. Mateas², C. Gruin²

¹Victor Babes University of Medicine and Pharmacy, Timisoara, Romania

²Rehabilitation and rheumatology department-City University and Emergency Hospital, Timisoara, Romania

³Orthopaedic and traumatology department-County University and Emergency Hospital, Timisoara, Romania

Introduction. Bone metastases are frequent and serious complications in cancer disease and represents a real challenge of nowadays medicine. **Materials and methods.** In a 2 year period, 52 bone metastatic patients had a pathologic fracture that needed a surgical orthopaedic treatment. For all these patients there has been a follow-up of two years. At the end, only 42 patients were present. 30 patients (group 1) followed a surgical treatment. 12 patients (group 2) followed both a surgical and a rehabilitation treatment. The studied 42 patients were analysed, by using the EORTC QLQ-C30 scale (European Organization for Research and Treatment of Cancer: Quality of Life Questionnaire C30), in successive assessments (during early in-patient phase, at 30 days, at 6 month, at 1 year, at 1 1/2 year and at 2 years postoperatively). Specimen from the rehabilitation patients bone marrow metastases were used in order to achieve an experimental study of bone metastases on embryonated egg chorioallantois membrane. **Results.** There were no significant differences between the two groups in the early postoperative phase in what concerns functional scales, symptom items and general health status ($P>0.05$). Group 2 patients had significantly better scores ($P<0.05$) in all the above mentioned areas at the great majority of assessments. Regarding the experimental study, the metastases behaviour is different from that of the primary tumours, changing their malignant and angiogenic phenotype according to the metastatic site. **Conclusion.** It is important not only to increase patients' survival, but also to improve their quality of life. Thus, the treatment of a pathologic metastatic fracture should include both an appropriate surgical procedure and an adapted rehabilitation program.

References

1. Mundy GR. Metastasis to bone: causes, consequences and therapeutic opportunities. *Nature Reviews Cancer* 2002;2:584-93.
2. Cole RP, Scialla SJ, Bednarz L. Functional recovery in cancer rehabilitation. *Archives of Physical Medicine and Rehabilitation* 2000;81:623-27.

Research regarding the quality of life in patients with surgically treated osteoarthritis

D. Nemes^{1,2}, D.V. Poenaru^{1,3}, Ouassim Drira³, M. Dragoi^{1,2}, E. Amaricai¹, D. Popa¹, L. Catan¹, D. Surducan¹, H. Vermesan^{1,3}, D. Vermesan^{1,3}, R. Prejbeanu^{1,3}, O. Suci¹, R. Onofrei¹, C. Milicin¹, G. Puenea¹, C. Galai², C. Mateas², C. Gruin²

¹Victor Babes University of Medicine and Pharmacy, Timisoara, Romania

²Rehabilitation and rheumatology department-City University and Emergency Hospital, Timisoara, Romania

³Orthopaedic and traumatology department-County University and Emergency Hospital, Timisoara, Romania

Introduction. Quality of life in patients with osteoarthritis has become a very important subject in nowadays medicine. The complex treatment of severe disabling osteoarthritis includes specific surgical procedures followed by an adapted rehabilitation therapy. **Materials and methods.** The study included 125 patients who undertook both a surgical and a rehabilitation treatment. 60 patients needed a total hip replacement and 29 patients needed a total knee replacement. 5 patients with cervical degenerative spinal stenosis and 31 patients with lumbar degenerative spinal stenosis required decompression with or without a spinal instrumental fusion. The ICF scale was used to analyse patients' quality of life. Successive assessments were accomplished as follows: preoperatively, in the early postoperative phase, at 3 month postoperatively and late postoperatively at 1 year. **Results.** The main categories for osteoarthritis were taken into account for each of the ICF parts. Pain relief, improvement in mobility of the involved joints and in muscle power were noticed in all the study patients at the final one year assessment. All of the patients had postoperative improvements in the activities rela-

ted to movement (walking, lifting, carrying objects), self care activities (dressing), domestic life activities (doing housework, acquisition of goods and services), community, social and civic life activities (recreation and leisure). The most important facilitator and barrier environmental factors for osteoarthritic patients have been also detected. **Conclusion.** Surgically treated osteoarthritic patients have an increased quality of life. That implies a better body functioning, as well as a higher rate of activity and participation, all of these related to specific environmental factors.

References

1. Dreinhofer K, Stucki G, Ewert T. ICF Core for osteoarthritis. *Journal of Rehabilitation Medicine* 2004;36(44):75-80.
2. Weigl M, Cieza A, Harder M. Linking osteoarthritis-specific health-status measures to the International Classification of Functioning, Disability and Health. *Osteoarthritis and Cartilage* 2003;11:519-23.

Complex assessment and therapies of the secondary scoliosis in inflammatory rheumatic diseases

D. Nemes^{1,2}, D.V. Poenaru^{1,3}, M. Dragoi^{1,2}, D. Popa¹, E.Amaricai¹, L. Catan¹, D. Surducun¹, O. Suci¹, R. Onofrei¹, D. Andrei¹, G. Puenea¹, C. Mateas², C. Galai², C. Gruin², O. Cretu⁴

¹Victor Babes University of Medicine and Pharmacy, Timisoara, Romania

²Rehabilitation and rheumatology department-City University and Emergency Hospital, Timisoara, Romania

³Orthopaedic and traumatology department-County University and Emergency Hospital, Timisoara, Romania

⁴Surgical department-City University and Emergency Hospital, Timisoara, Romania

Introduction. The quantification of the scoliosis complex therapy in patients with secondary scoliosis occurred in inflammatory rheumatic disorders and the assessment of the different methods' sensibility. **Materials and methods.** In a 2 year period 40 patients were evaluated by scanning the vertebral spine geometry using Zebris system. Patients were split in 2 groups according to their therapy agreement. Group 1-25 patients benefited from disease specific drug therapy (according to international guidelines) and also from a special rehabilitation program, two sessions of rehabilitation therapy per week, during one year. Group 2-15 patients underwent only disease specific drug therapy. The patients' assessments were performed initially, at 6 and 12 months. Therapy general efficiency was determined by vertebral spine geometry scanning, using Zebris system, based on ultrasounds, measuring the major curvature angle. Group 1 patients were also assessed by using pro-inflammatory sera parameters, initially and at the end of the study period. **Results.** All group 1 patients had significant improvement of the major curvature angle regardless the underlying pathology. In the absence of the rehabilitation therapy, all group 2 patients had a low, but constant increase of the major curvature angle. The pro-inflammatory sera parameters have significantly improved in group 1 patients after one year period. **Conclusion.** Controlling the joints swelling and stiffness in inflammatory rheumatic diseases, with a specific medical treatment of the underlying disease and applying a complex rehabilitation program we increase patients compliance. By geometrical analysis of the vertebral spine using the Zebris system can be obtained dates regarding all the angles and movements of the vertebral spine, more complex and more sensitive assessment than the classic radiology.

References

1. Pearsall DJ, Reid JG, Hedden DM. Comparison of the three noninvasive methods for measuring scoliosis. *Physical Therapy* 1992;72:648-56.
2. Zebris GmbH, Spine Analysis, Germany, 2006 (<http://www.zebris.de>).

Sexuality rehabilitation on a spinal cord injury Portuguese population

A. Garrett¹, F. Martins², Z. Teixeira²

¹Ph.D. Fellow; Hospital Rovisco Pais; Universidade Fernando Pessoa;

²Universidade Fernando Pessoa

Introduction. The trajectory of sexual activity after a spinal cord injury includes an initial period of apparent asexuality, followed by a period of rediscovery that usually occurs during the time of rehabilitation. The aim of this paper is to present the preliminary results of an ongoing Ph.D. research on sexual rehabilitation following an acquired spinal cord injury and propose an appropriate experimental intervention. **Materials and methods.** We evaluated a spinal cord injured population from a Portuguese hospital (n=35), from

January to December 2009, composed of individuals aged between 20 and 55 years old, of both genders. The recruitment was done through purposeful sampling, snowball type. We used semi-structured interviews to study 5 sexuality dimensions: sexual mourning after injury; last sexual contact up to the questionnaire; importance of sexuality; ability to achieve orgasm; and erogenous zones mapping. The statistical treatment was performed using the SPSS[®]. **Results.** 80% reported having thought about sexual issues in the first 3 months. 34.3% admitted having their first sexual contact during the first 3 months. 44% reported having had sexual contact in the week preceding the interview and 49% indicate that sexual activity is a very important factor for the well-being. On the erogenous zones map participants pointed mouth and neck, followed by the scalp. **Conclusion.** Our sample is close to the population mentioned in the literature, except the sexual mourning. It is mandatory an early intervention in spinal cord injured patients, integrated into a systematic plan. The assessment should focus on the subject's narratives, to find a pleasant sexuality and a satisfying sex life, compatible with their new situation.

References

1. Garrett, A, Teixeira, Z. (2006). A utilização do modelo PLISSIT na abordagem da sexualidade do lesionado vértebro-medular por trauma. In: Revista da FCHS – UFP, Vol. 3, pp. 237-244.
2. Ostrander, N. (2009) sexual pursuits of pleasure among men and women with spinal cord injuries. In: Sex Disabil, Vol.27, pp. 11-19.

The weight bearing paraplegic arm

Y. Dionyssiotis^{1,2*}, G. Lyritis², M. Georganas³, D. Stavrianakis³, P. Papaioannou²

¹Rehabilitation Department, 3ct & Mri Department, Rhodes General Hospital, Rhodes,

²Laboratory For Research of the Musculoskeletal System, University of Athens, Kifissia, Greece

Introduction. Subjects with spinal cord injury lose muscle and bone mass, but increase body fat in areas below the level of neurological injury. On the other hand, paraplegia is associated with continued use of upper extremities. The purpose of this study was to investigate the changes of composition of paraplegic upper limb according to the neurological level of injury. **Materials and methods.** The study included thirty paraplegics in chronic phase (> 1.5 years) with complete paraplegia (AIS A) who were divided according to the neurological level of injury in group A (n = 16, high paraplegia: above thoracic (T) 7 neurological level of injury (NLoI) with age: 33 ± 16 years, duration of paralysis (DoP): 6 ± 6 years, and group B (n = 15, low paraplegia, T8-T12 NLoI with age: 39 ± 14 years, DoP: 5.6 ± 6 years, which were compared with 33 healthy controls (group C) of similar anthropometric characteristics. All were examined by whole body DEXA (Norland XR 36, Norland Corp., USA) regarding the local (arm) bone density, muscle mass and fat. **Results.** Bone density was found statistically significant between groups (p = 0.008) and pair-wise comparisons revealed statistically significant differences between high vs. low paraplegia group and controls (p = 0.028, p = 0.01, respectively). A negative correlation was found in the high paraplegia group of muscle to fat mass (p = 0.009, r = -0.67). Muscle mass was increased by 2% and fat mass decreased 26% in high paraplegics compared with low paraplegics. **Conclusion.** These results suggest the occurrence of significant changes in the composition of weight bearing paraplegic arm.

References

1. Dionyssiotis Y, Lyritis G, Papaioannou N, Papagelopoulos P, Thomaidis T. The influence of the neurological level of injury muscles and fat in paraplegia *Journal of Rehabilitation Research & Development* 2009;46(8):1037 - 1044.
2. Dionyssiotis Y, Petropoulou K, Raptidi CA, Papagelopoulos P, Papaioannou N, Galanos A, Papadaki P, Lyritis GP Body composition in paraplegic men *J Clin Densitom.* 2008 Jul-Sep; 11(3):437-43.

The association of physical activity and calcium intake with bone parameters

Y. Dionyssiotis^{1,2*}, I. Paspati², G. Trovas², P. Papaioannou², G. Lyritis²

¹Rehabilitation Department, Rhodes General Hospital, Rhodes, Greece

²Laboratory For Research of the Musculoskeletal System, University of Athens, Kifissia, Greece

Introduction. To investigate the association between physical activity and calcium intake on bone parameters. **Materials and**

methods. To measure T-score and stiffness index in 1890 pre- and postmenopausal women we used an Achilles Express QUS device (GE Lunar Corp.) in the ankle and assessed physical activity and dietary calcium intake with a questionnaire designed for this study (modification of MEDOS questionnaire). Participants were divided according to: 1) weekly physical activity in women who have reduced activity (have not or occasionally exercised), moderate and regular activity and 2) daily consumption of calcium in women with intake of less or more than 800 mg. **Results.** The comparison of stiffness index was statistically significant among premenopausal women and women with reduced ($p = 0.016$) and regular physical activity ($p = 0.039$). In premenopausal women who exercised regularly and received calcium above 800 mg QUS T -score values were significantly higher ($p < 0.05$) compared to the other regardless of consumption of calcium. **Conclusion.** Regular physical activity and adequate calcium intake is appropriate for women to get the greatest benefits for bone health.

References

1. Trovas G, Tsekoura M, Galanos A, Dionyssiotis Y, Dontas I, Lyritis G, Papaioanou N. Quantitative ultrasound of the calcaneus in Greek women: normative data are different from the manufacturer's normal range. *J Clin Densitom* 2009 Jul-Sep;12(3):353-9.
2. Khan K, McKay H, Kannus P, Bailey D, Wark J, Bennell K. Physical activity and bone health. *Human Kinetics*. IL, 2001:103.
3. Pfeifer M, Sinaki M, Geusens P, Boonen S, Preisinger E, Minne HW. Musculoskeletal rehabilitation in osteoporosis: a review. *J Bone Miner Res* 2004; 19:1208-1214

Sympathetic Skin Response in Reynaud's phenomenon

Mohammad Reza Emad¹, Masoumeh Gerami Tayebi², Mohammad Ali Nazarinia³, Mohammad Javad Hadianfard³, Ali Reza Ashraf¹

¹Associate professor of Physical Medicine and Rehabilitation, Department of Physical Medicine and Rehabilitation, Shiraz University of Medical Sciences, Iran

²Resident of Physical Medicine and Rehabilitation, Shiraz University of Medical Sciences, Iran

³Associate professor of Rheumatology, Department Of Rheumatology, Shiraz University of Medical Sciences, Iran

Introduction. Autonomic nervous system (ANS) dysfunction seems is an important cause that leads to Raynaud's phenomenon (RP). Diagnosis of autonomic system disorders is therefore difficult .One method for assessment of sympathetic fibers impairment in peripheral neuropathies as well as disorders of sympathetic system in other disease is the evaluation of Sympathetic skin Response(SSR).

Materials and methods. Twenty patients with primary and secondary Raynaud's phenomenon and 20 healthy subjects for control group were studied. All the patients and controls were examined at first and the SSR was measured in all of the patients and control group by standard protocol . In both groups , subjects with diabetic mellitus , thyroid disease , signs or symptoms of peripheral neuropathy and drugs consumption that had effect on ANS, were excluded. **Results.** The patients had a mean age of 43.1±9 years .The SSR to the electrical stimulus was absent in 3 patients . Right and left median nerves latencies lasted 1.86±0.55 and 1.79±0.5 seconds respectively. Comparison these findings with control group revealed significant differences for SSR latencies (P. Value < 0.001). The mean amplitude had not significant differences in both groups (p. value > 0.001). **Conclusion.** Overall in our study 80% individuals with Raynaud's phenomenon presented abnormal SSR (P . value < 0.001) . It has been suggested that the absence or prolonged latency of SSR were associated with the disorders of unmyelinated axons in RP

Treatment of spasticity and functional Outcome after botulinum toxin a (botox®) injection in patients with neurologic lesions

Y. Dionyssiotis^{1*}, D. Kiourtidis², A. Karvouni², A. Kaliontzoglou², I. Kliafas²

¹Rehabilitation Department

²Neurologic Department, Rhodes General Hospital, Rhodes, Greece

Introduction. To observe the functional outcome of Botox injection in patients with neurologic lesions and to correlate it to the units injected, the regions of muscles selected the reduction of spasticity's degree. **Materials and methods.** We examined records for all in- and out- patients (pts) with neurologic lesions (stroke, multiple sclerosis, spinal cord injury, traumatic brain injury etc.) referred

to our departments during an 18 month period who received BoNT-A (Botox®, Allergan Inc, Irvine, CA, USA), (25 male / 18 female) for spasticity. We studied data on examinations of the injected muscles' regions, BoNT-A dosage, number of sessions, the reduction of spasticity and functional targets and parameters who interfere in rehabilitation process: 1) effect on the pain, 2) clonus, 3) Barthel index, 4) use of orthotics, 5) percentage of pts referred for baclofen pump implantation. **Results.** Seven pts repeated 2nd, 8 pts 3rd, 2 pts 4th and 1 pt 5th Botox sessions. An improvement on spasticity degree ($p < 0.0005$) was seen but did not differ significantly between sessions. No difference in improvement between patients with a traumatic or non-traumatic pathology was found. To maintain the functional benefits, sessions had to be repeated (mean interval 4 months). There was improvement of pain in all pts. Clonus was reduced and Barthel index was significantly increased between sessions ($p = 0.048$). No significance between groups for baclofen pump referencing was found. We found a correlation between spasticity degree difference between sessions and units injected in the upper limbs ($r = 0.5$) but no correlation with number of injections administered, and between the degree of improvement with Botox and baseline ASIA score. **Conclusion.** The main limitation of this study was the small participants' number underpowering the study. Also, different patients received different BoNT-A doses and number of injections. In a clinical setting this reflects every day practice.

References

1. Esquenazi A: Improvements in healthcare and cost benefits associated with botulinum toxin treatment of spasticity and muscle overactivity. *Eur J Neurol* 2006;13 Suppl 4:27-34
2. Bhakta BB, Cozens JA, Bamford JM, Chamberlain MA. Use of botulinum toxin in stroke patients with severe upper limb spasticity *J Neurol Neurosurg Psychiatry*.1996;61:30-35.
3. Simpson DM, Alexander DN, O'Brien CF, Tagliati M, Aswad AS, Leon JM, Gibson J, Mordaunt JM, Monaghaw EP. Botulinum toxin type A in the treatment of upper limb extremity spasticity: a randomised double blind, placebo controlled trial. *Neurology*. 1996;46:1306-1310.
4. Pathak MS, Nguyen HT, Graham HK, et al: Management of spasticity in adults: practical application of botulinum toxin. *Eur J Neurol* 2006;13 Suppl 1:42-50.

Massotherapy in active first stage of labour

P. Tessari, A. Scognamillo

?????

Introduction. The aims of this study are to discussed massage therapy and its use in obstetric practice, check the reproducibility of studies in the literature and investigate the effectiveness and potential benefits from the use of massage during labour, in particular, regarding the control of pain. **Materials and methods.** The objective is obtained through a review of available literature and through a pilot study case-control. The study, carried out in collaboration with University of Turin – Course of Degree in Obstetrics, involves 30 patients in the first stage of labour; 15 patients are subjected to massotherapy. The applied massage consists in superficial and circular movements, performed by mid-wife with the palm of the hands, in lumbar area of the patient for 2-3 continuative minutes, if possible extending for an hour, with a 5-10 minutes break. **Results.** The group of patients, subjected to massage, achieves a reduction of pain (Student's t-test: p-value < 0,01) and a reduction in time of dilation period (Student's t-test: p-value < 0,05). In this study, in accordance with short current literature, massotherapy demonstrates to control pain and to prevent the use of further methods of containment of pain. **Conclusion.** All the patients accepted massotherapy, with enthusiasm and curiosity, describing it as a pleasant and relaxing experience. Simple technique helps to create a protective atmosphere and a particular positive relationship with the patient during the active first stage of labour. Additional study is required before using massotherapy in usual clinical settings.

References

1. Clay J H, Pounds D M. Fondamenti clinici della massoterapia. Piccin: Padova; 2009.
2. Shmid V. Il dolore del parto. Centro studi il marsupio: Firenze; 1998
3. Hedstrom LW, Newton N. Touch in labor: a comparison of cultures and eras. *Birth*. 1986 Set ;13(3):181-186.
4. NICE. Intapartum care: care of healthy women and their babies during childbirth – Clinical guideline. 2007.
5. Huntley AL, Coon JT, Ernst E. Complementary and alternative medicine for labor pain: a systematic review. *Am. J. Obstet. Gynecol*. 2004 June ;191(1): 36-44.
6. Field T, Hernandez-Reif M, Taylor S, Quintino O, Burman I. Labor pain is reduced by massage therapy. *J Psychosom Obstet Gynaecol*. 1997 Dic ;18(4):286-291.

7. Chang M, Wang S, Chen C. Effects of massage on pain and anxiety during labour: a randomized controlled trial in Taiwan. *J Adv Nurs*. 2002 Apr ;38(1):68-73.
8. Kimber L, McNabb M, Mc Court C, Haines A, Brocklehurst P. Massage or music for pain relief in labour: A pilot randomised placebo controlled trial. *European Journal of Pain*. 2008 ;12(8):961-969.

Spasticity Management “the latest developments in specific disorders

Z.P. Dalivigka, Specialist, Fellow of European Board of PRM
*Physiatrist of the Cerebral Palsy Greece Society, Athens, Greece
 Research Fellow, Cerebral Palsy and Paediatric Movement Disorders
 Clinic, Paediatric Department, Attikon University Hospital, Athens,
 Greece*

Cerebral palsy (CP) is a term that refers to a cluster of neurological conditions resulting from an insult in the developing brain early in life and is as common as 1.5 to 3 over 1000 live births. Spasticity can be a severe, disabling symptom in children and adults with CP, along with dystonia and other extrapyramidal or ataxic disorders. Managing spasticity is an important task of specialists of the rehabilitation team and is nowadays, done with several pharmaceutical, surgical and physical interventions: oral medications, botulinum toxin (BTX) intramuscular injections or alcohol/phenol nerve blockades, continuous baclofen administration by intrathecal catheter, neurosurgical procedures, physical therapy, splinting, serial casting, stretching, positioning etc. In the recent years the challenge of evidence-based rehabilitation has been to prove whether the methods used to treat spasticity can also contribute to quality of life and participation apart from altering the impairment. In this perspective, BTX injection is a valuable tool in the hands of rehabilitation teams, in order to address short and long-term impairment and activity issues, since it has been shown that, apart from producing a reversible, focal, selective muscle weakness and thus reducing spasticity, it can also reduce the need for multilevel orthopaedic surgery in children with CP. One can also find in the literature that botulinum toxin can be used to ameliorate the parameters of gait, reduce drooling and improve hand function. BTX therapy has its limitations, is not to be considered as a single intervention, and is mainly used to reduce spasticity in order to allow or ease other rehabilitation procedures. It can also be combined with other pharmacological methods of reducing spasticity. Managing spasticity in children with CP is a task that requires reliable evaluation and outcome methods, careful goal-setting involving the patient and family and a multidisciplinary, efficient and committed rehabilitation team.

Virtual reality and motor rehabilitation of the upper extremity in the first year after stroke

P. Kiper, A. Turolla, L. Piron, M. Agostini, L. Cocco, A. Vendramin, S. Rossi, A. Baba, P. Tonin
*Department of Neurorehabilitation IRCCS San Camillo Hospital,
 Alberoni 70, 30126 Venice, Italy*

Introduction. The purposes of the study were: to investigate the effectiveness of Reinforced Feedback in Virtual Environment (RFVE) compared to the Traditional Neuromotor Rehabilitation (TNR), for the recovery of the upper extremity function after stroke and to observe if the effect size changed related to the kind of stroke (hemorrhagic or ischemic). **Materials and methods.** Patients affected by a stroke, occurring at last 1 year before the enrollment were recruited. 44 patients (24 ischemic and 20 hemorrhagic) were randomized into 2 groups (RFVE and TNR). Both treatments lasted 1 hour daily. The upper extremity performance was evaluated at baseline and 1 month thereafter. Clinical and kinematic assessments included respectively the Fugl-Meyer Upper Extremity scale (F-M UE), the Ashworth scale, the Functional Independence Measure (FIM) and the mean linear velocity (Speed), the duration of movements (Time), the number of submovements (Peak). **Results.** In the RFVE and TNR groups outcomes changed respectively: F-M UE (13,7%) – (2,1%); FIM (15,1%) – (4,3%); Ashworth (35,0%) – (-30,4%); Time (39,9%) – (14,7%); Speed (23,8%) – (15,1%) and Peak (21,5%) – (9,7%). The differences between groups were statistically significant (U Mann-Whitney test $p \leq 0.05$), in all the variables except Speed. In the RFVE and TNR hemorrhagic groups the outcomes changed respectively: F-M UE (19,0%) – (2,6%); FIM (15,0%) – (5,2%); Ashworth (22,0%) – (0,9%); Time (39,3%) – (21,1%); Speed (21,6%) – (20,0%) and Peak (21,7%) – (12,0%). The differences between groups were statistically

significant in all the variables except Speed and Ashworth scale. In the RFVE and TNR ischemic groups the outcomes changed respectively: F-M UE (10,1%) – (1,6%); FIM (9,6%) – (3,6%); Ashworth (50,0%) – (-61,0%); Time (40,5%) – (40,0%); Speed (26,4%) – (26,5%) and Peak (21,6%) – (21,6%). The difference between groups was significant in Ashworth ($p=0.002$). **Conclusion.** These results indicated that some post-stroke patients may benefit from a RFVE program to improve their upper extremity function. We observed that the upper limbs mobility improved regardless of the kind of stroke.

References

1. Todorov E., Shadmehr R., Bizzi E. Augmented feedback presented in a virtual environment accelerates learning of a difficult motor task. *J Mot Behav*. 1997;29(2):147-158.
2. Piron L., Tonin P., Piccione F., et al. Virtual environment training therapy for arm motor rehabilitation. *Presence* 2005;14(6):732-740.
3. Krakauer J.W. Motor learning: its relevance to stroke recovery and neuro-rehabilitation. *Curr Opin Neurol*. 2006;19(1):84-90.

Audit of Medical Record Keeping

N. Memon, R. Hanspal
Musgrove Park Hospital, Taunton, Somerset, UK

Introduction. Complete and accurate medical records are essential for effective patient care and improves patient safety and quality of care. They are also the most important focus of any patient complaint and litigation. The aim of the audit is to establish if records are meeting the recommended standards. **Materials and methods.** The standards chosen from the Royal College of Physicians Standards on medical record keeping (1) were: 1) Every page should include the patient’s name, identification number and location in hospital. 2) Every entry should be dated, timed and signed by the person making the entry. The name and designation of the person making the entry should be printed against their signature. A retrospective review was conducted of the medical records of patients admitted to the rehabilitation ward over a 8 month period using a standards proforma. **Results.** Number of patients admitted 32. Notes available for audit 30. None of the records had the patients’ location in hospital recorded on all pages. Only 10% patients had their identification number written on all pages of the notes. Ninety percent had their name written on all pages. The name of the staff member writing in the notes was documented in 80% ,the date in 92%, time in 80% and the signature in 83% of patients records. Recording of staff designation varied from 11 % to 100 % of all entries. **Conclusion.** The Audit demonstrated poor record keeping in recording patient location, patient identification number, and designation of staff writing in the records. This can have significant medico-legal implications in cases of litigation . Incomplete record keeping also influences patient safety and quality of care. The Audit highlights the need for improving staff awareness through appropriate training.

References

1. Generic Medical Record Keeping Standards, Royal College of Physicians, London, 2007.

Survey on the sexuality of para-tetraplegic women

E. Andretta¹, C. Zuliani², E. Cossaro¹, L. Spolaore¹, S. Buoso³
¹*Urology Unit, General Hospital DOLO (Venice)*
²*Neurology Unit, General Hospital MIRANO (Venice),*
³*Physical and Rehabilitation Department, General Hospital DOLO (Venice)*

Introduction. We evaluated sexuality in para-tetraplegic women on a wheelchair (PaTe) who accessed our department in 2009. **Materials and methods.** A self-made questionnaire was used and 31 PaTe, mainly spinal cord injury (SCI), were enrolled. **Results.** The age ranged between 23 and 63 years (mean 43). The mean age of para-tetraplegia onset was 28.8 years. Ten women were unmarried, 17 married and 4 divorced; 81% have or have had a partner post-paraplegia, 17 had children (6 conceived post-paraplegia). *Sexually active:* 71% PaTe reported to have been sexually active post-paraplegia with suitable vaginal lubrication. Genital sensitivity was preserved in 11 and absent in 11. The 64% of PaTe had orgasm (even if at a reduced intensity or obtained with difficulties in 8); in 4 the orgasm was reached notwithstanding the genital anesthesia (GA). GA was present in 7/8 anorgasmic patients but 91% of GA was sexually satisfied. Sex was satisfactory for 77.3% women and 95.4% PaTe used contraceptive methods. *Sexually inactive:* In 8 patients (3 cervical SCI) the onset of paraplegia dated to a mean lower age compared to

the Sex active PaTes (25.7 vs. 28.8 years) and this age further decreased to 20 in the 6 unmarried women. **Discussion.** The PaTe in whom the para-tetraplegia happened at a young age, especially if they were unmarried and tetraplegic, resulted the most affected in Sex. The majority of the PaTe has an affair with sex intercourses and reports sexual satisfaction. Four GA were able to reach the orgasm, probably thanks to extragenital stimulation or to fantasies. **Conclusion.** Many PaTe preserve a satisfactory sexual life.

References

1. Sipski ML, Alexander CJ, Rosen R. Sexual arousal and orgasm in women: effects of spinal cord injury. *Ann Neurol.* 2001; 49(1): 35-44.
2. Del Popolo G. Donne. Vademecum alla sessualità femminile per persone con lesione midollare o sclerosi multipla Bologna 2004.

The protective role of endurance exercise training against oxidative damage in the brain of rats with induced diabetes

Muhammed Al-Jarrah¹, Mohammed Jamous², Yousef Al Hamadi³, Ahed Al-Khateeb²

¹From The Department of Physiotherapy. Faculty of Applied Medical Sciences. Jordan University of Science and Technology (JUST). 22110 Irbid-Jordan.

²From The Department of Neurosurgery. Faculty of Medicine, (JUST). Irbid-Jordan

³From The Department of Toxicology and Forensic Sciences. Faculty of Medicine. JUST. Irbid-Jordan.

Introduction. Diabetes is not viewed as a single disease but it is rather a group of metabolic disorders include alterations in the carbohydrate, fat, and protein metabolism associated with absolute and/or relative deficiencies in insulin secretion. It has been reported that the pathophysiology of diabetes includes increased oxidative stress and impaired expression of endogenous antioxidants in different tissues and organs in the body. **Goals and objectives.** The main goal of this study is to evaluate the expression of heat shock protein (HSP), and inducible nitric oxide (iNO) in the brain of rats with induced diabetes, and to study the effect of endurance exercise training on the expression of these markers. **Materials and methods:** Forty male Sprague-Dawley rats were randomized into 4 groups, sedentary control (SC, n=10), exercise control (EC, n=10), sedentary diabetic (SD, n=10), and exercise diabetic (ED, n=10). Diabetes was induced by alloxan injection (120 mg/kg). Treadmill exercise training was carried out for 4 weeks starting as soon as the animals developed diabetes. Animals were sacrificed, and brain tissues were evaluated by immunohistochemistry for the expression of HSP and iNO. **Results and discussion.** Diabetes leads to decrease level of HSP, There was also significant increased level of iNO in diabetic rats. Exercised reversed the trend in diabetic rats and significantly increased the level of HSP and decreased the level of iNO. **Conclusion.** Exercise, in part protects the brain from oxidative stress damage that accompanied diabetes.

Assessment of disability in obese patients

CapP. odaglio, A. Brunani, G. Spera, L.M. Donini
Istituto Auxologico Italiano IRCCS

Introduction. Obesity is a chronic disease associated with an increased risk of disability. The aim of the study was to validate a new assessment test proposed in 2009 by the Italian Society for Obesity to measure disability. **Materials and methods.** A multicentric study involving 16 Centres in Italy was performed. The assessment test (TSD-OC) is composed by 7 sections (pain; stiffness; activities of daily living and indoor mobility; housework; outdoor activities; occupational activities; social life) and 36 items. The patient assesses subjectively disability for each item by means of a visual analogue scale. TSD-OC was validated against different functional (6-minute walking test, 6MWT) and quality of life parameters (SF-36). The following assessments were also administered: Roland-Morris Disability Questionnaire (RMDQ), Disabilities of the Arm, Shoulder and Hand (DASH), the Western Ontario and McMaster Universities index (WOMAC), SF-12 questionnaire and Short Physical Performance Battery (SPPB). **Results.** 449 obese subjects (30.5% M, 69.5% F; mean age 51.1 ± 14 years) were enrolled in the study. A statistical significant correlation was found between TSD-OC, SF-36 and 6MWT. No significant correlations between BMI and RMDQ, DASH, WOMAC, SF-12. Results showed a high correlation between BMI and TSD.OC, both for the global score and for some items:

“pain while carrying loads” (rho= 0.47), “difficulty at work” (rho= 0.51), “need to be often absent from work” (rho= 0.46). **Conclusion.** Disability correlated to obesity is peculiar: our study suggests that TSD.OC can be considered a general assessment tool and, given the lack of disease-specific scales, it can be proposed as a valid assessment of the obesity-related disability.

References

- Ells LJ, Lang R, Shield JP, Wilkinson JR, Lidstone JS, Coulton S, et al. Obesity and disability - a short review. *Obes Rev* 2006;7(4):341-5.

A complex case of pituitary apoplexy

N. Memon, R. Hanspal

Musgrove Park Hospital, Taunton, Somerset, TA1 5DA, UK

Introduction. We present a complex case of pituitary apoplexy with total blindness, behavioural problems and suicidal intent. Incidence of apoplexy in pituitary adenoma is 2-7%. Pituitary apoplexy causing visual loss is seen in 62% of cases. Combination of pituitary apoplexy with total blindness, over anticoagulation, severe behavioural and physical problems makes this case complex, highlighting the need for provision of specialist rehabilitation in an acute setting. **Clinical Details.** A 71 year old gentleman with a known pituitary adenoma was admitted with total blindness secondary to haemorrhage in the pituitary adenoma due to over warfarinization. He required reversal with fresh frozen plasma but was deemed unsuitable for surgery. He was on warfarin for atrial fibrillation. He was bed bound and totally dependent. He had a past history of left sided hemiparesis, type 2 diabetes mellitus and heart failure. His behaviour problems consisted of screaming episodes causing major disruption to the smooth functioning of the ward. He was clinically depressed, threatened suicide and was assessed psychiatrically as being a high suicide risk. **Management.** The rehabilitation team managed his physical, sensory and behaviour problems. Acute speciality input was required from endocrinology for his unstable electrolytes, from cardiology for acute heart failure management and from psychiatry for his suicide risk. He was not considered appropriate for transfer to a psychiatric facility or community hospital and his care could only be provided in the acute hospital. **Conclusion.** This case demonstrates the importance of close monitoring of anticoagulation. The case also raises service delivery issues. Currently rehabilitation services in the UK seem to be moving into the community. This case demonstrates the need for future service planning to ensure that complex cases can receive rehabilitation in an acute hospital setting where access is available to all the acute specialities.

Treatment of patients with fibromyalgia syndrome with vibration massage by deep oscillations

K. Kraft, S. Kanter, H. Janik

Chair of Complementary Medicine of the University of Rostock, Germany

Introduction. The effective treatment of fibromyalgia syndrome (FMS) is still under discussion, however, some patients seem to profit from light massage (1). The aim of the present pilot study was the evaluation of the tolerability of treatment with vibration massage (deep oscillation) and of the effects on symptom severity, pain, and quality of life in patients with FMS. **Materials and methods.** In a prospective observational study patients (n = 70, age: 57.3 ± 10.5 years) were assigned to receive 10 treatments with deep oscillation massage with an electrical device within 5 weeks. Outcome parameters were adverse events, the fibromyalgia impact score (German version (FIQ-D)), the subjective pain (VAS), the quality of life (SF-36) and the McGill Pain Questionnaire (MPQ). Data was collected at baseline (I1), after completion of treatment (I2) and additionally 2 months after I2 (I3). **Results.** Sixty-three patients finished the study per protocol. At I2 and I3, the FIQ-D and all measures of pain and quality of life were improved clinically relevant (p<0.001). At I2, patients reported that the adverse events related to treatment (n=56, mainly pain and fatigue) were mild and short lasting, they did not result in drop-outs. Twenty-nine patients did not report any adverse events. Patients rated the tolerability of the treatment as 1.8 (95% CI 1.53;2.07) (5 point Likert scale). **Conclusion.** The results of the study suggest that a treatment series with deep oscillation massage has a long-lasting effect on symptoms of fibromyalgia, pain and quality of life. As it was well tolerated, it may be a useful and safe tool for the symptomatic treatment of FMS.

References

1. Asplund, R. Manual lymph drainage therapy using light massage for fibromyalgia sufferers: a pilot study. *Orthopaedic Nursing* 2003;7:192-196.

Superimposed neuromuscular electrical stimulation to recover range of motion at the hand

M. Boisgontier, V. Nougier

?????

Introduction. Proximal interphalangeal joint (PIP) injuries can reduce the functional capacity of the entire hand. To prevent such a physical impairment, range of motion (ROM) must be recovered as soon as possible after injury. The present study intends to compare the effects of voluntary muscular contraction (VOL) and superimposed electrical stimulation (ES+VOL)¹ on the ranges of flexion and extension recovery at the finger PIP following sprain. **Materials and methods.** Eight subjects (25.9±4.7 years) participated voluntarily in this study. Participants were seated with their right hand placed on a hand rehabilitation pegboard.² Two conditions of VOL and ST were performed in flexion and extension motions of the PIP. During twenty min sessions, the task was to bend (or to stretch) fingers when they were feeling current at the non-tested arm. Train characteristics were 30 Hz frequency, 200 µs pulse duration, and 40% duty cycle (4 s on, 6 s off). Stimulation was delivered at the maximal tolerated intensity (mean intensity used was 28.2 ± 7.1mA) to the tested arm in ST conditions and at a sensitive intensity to the non-tested arm in both conditions. Immediately before and after each condition, active range of motion was measured using a finger goniometer. **Results.** Analyses of the data showed that (1) in all conditions, ranges of motion were significantly greater post-session than pre-session ($P < 0.05$). Analyses of ranges of motion showed (2) that ROM was significantly greater in the ST condition ($P < 0.05$) in flexion. **Conclusion.** The present findings suggest that ST allows muscle contraction features that are more efficient to reduce adhesions and joint stiffness. They also evidence that this technique could ensure better mobility of the finger PIP joint following sprain.

References

1. Paillard T, Noé F, Passelergue P, Dupui P. Electrical stimulation superimposed onto voluntary muscular contraction. *Sports Med.* 2005;35:951-66.

Superimposed Neuromuscular Electrical Stimulation Effects on Maximal Voluntary Contraction

M. Boisgontier, M. Emprin, N. Vuillerme, M.D. Iversen

?????

Introduction. There is conflicting evidence regarding the effectiveness of protocols using the superimposed electrical stimulation technique (SES) on improving maximal voluntary contraction (MVC) in real time.

The purpose of this study was to examine maximal grip strength in three conditions of contraction – MVC; SES at pre-motor intensities and SES at maximal intensities – in order to better understand effectiveness and limitations of superimposed neuromuscular electrical stimulation in rehabilitation. **Material and methods.** Twelve right-handed males (mean age: 35±11 years) participated in this study. They were seated and were instructed to perform three grip determinations with maximal strength in the three testing conditions that were randomly performed. Isometric strength measures in kilograms were assessed using a Jamar dynamometer. Electrical stimulation were delivered at a premotor intensity (14.8±1.5 mA) in the SESpremot condition and at the maximal tolerated intensity (29.5 ± 6.8 mA) in the SESmax condition. Two electrodes were placed on the participant's forearm. Joint blocking was required at the wrist and was set up using a hand therapy pegboard. The results obtained in the three testing conditions (MVC, STpremot and STmax) were averaged across the 3 trials. **Results.** The ANOVA showed decreasing maximal force production from MVC to STpremot and from STpremot to STmax ($F_{2,22}=24.67$, $P<.0001$). The post-hoc analysis revealed significant differences between all these conditions ($P<.01$). **Conclusion.** The primary outcome of this trial is a statistical ($p<.05$) and clinical decrease in maximal grip strength in SES. Interestingly, this decrease is related to the electrical stimulation intensity: the higher the intensity, the weaker the grip strength (MVC>SESpremot>SESmax). These data suggest that ST unbalanced muscular synergies that are essential to produce maximal grip strength at the hand.¹

References

1. Valero-Cuevas FJ, Zajac FE, Burgar CG. Large index-fingertip forces are produced by subject-independent patterns of muscle excitation. *J Biomech.* 1998;31(8): 693-703.

Effects of Electrical Stimulation Superimposed to Voluntary Muscular Contraction on Muscular Endurance

M. Boisgontier, B. Moineau, R. Cuisinier, N. Pinsault, V. Nougier

Introduction. The effects of superimposed electrical stimulation on maximal voluntary contraction have been studied in the context of muscle strengthening. However, none of the concerned studies has investigated the possible effects of this technique on muscular endurance. Therefore, the purpose of the present study was to assess in real-time effects of superimposed electrical stimulation on voluntary maximal contraction over time. **Materials and methods.** 17 right-handed adults participated in the experiment. They were seated in front of a force platform (AMTI®, model OR6-5-1) vertically positioned. Two electrodes were placed onto the left forearm and two other electrodes onto the right triceps brachii muscular body. Participants were instructed to produce maximal force against the force platform when they were feeling stimulation in their left forearm. They performed 50 repetitions in two conditions of voluntary muscle contraction alone (VOL) and with superimposed electrical stimulation (SES). For electrical stimulation, a portable stimulator (Elpha 2000, Danmeter) was used to deliver stimulation at a sensitive intensity to the forearm in both conditions and at the maximal tolerated intensity to the right arm in the SES condition.

Force production was analyzed during 500 sec. Data forces were sampled at 100 Hz (12-bit A/D conversion) and low pass filtered with a second-order Butterworth (10 Hz). **Results.** The ANOVA showed a significant main effect of condition of contraction ($F_{1,800}=64.21$, $P<.0001$). The interaction of Condition of contraction (VOL vs ST) x Number of trials (from 1 to 50) was also significant ($F_{49,800}=2.66$, $P<.0001$). Fisher post-hoc test revealed that force production significantly decreased in the VOL condition as compared to the ST condition from the 31st trial ($P<.05$). **Conclusion.** The present findings suggested that SES enables to maintain a high level of force during a longer period of time than the voluntary muscular contraction alone.

Audit of discharge reports following Traumatic Brain Injury

R. Hanspal, T. Abdul-Wahab

Musgrove Park Hospital, Taunton, Somerset, TA1 5DA, UK

Introduction. Discharge reports form an important part of communicating relevant information about a patient's in-patient hospital care to the General Practitioner. The aim of the audit was to establish if appropriate information was included in the discharge reports of patients with traumatic brain injury (TBI) discharged from specialist rehabilitation beds in hospital back to the community. **Materials and methods.** The Standards set specified that the Glasgow Coma Score (GCS), duration of loss of consciousness (LOC), duration of Post Traumatic Amnesia (PTA), seizures, imaging results, cognitive impairments and follow up plans must be included in all discharge reports. A retrospective review was undertaken of discharge reports of all patients discharged from the neurorehabilitation beds over a year with a diagnosis of TBI. A proforma was completed for all patients and the data analysed. **Results.** The total number of discharge reports was 18. GCS was recorded in 5 (27.78 %), LOC in 15 (55.55 %), PTA duration in 0, imaging results in 13 (72.2 %), the presence or absence of seizures in 8 (44.44 %), cognitive impairments in 8 (44.44 %) and follow up plans were documented in 17 (94.44 %) of the 18 discharge reports. **Conclusion.** The Audit showed significant omissions in the discharge reports. Inclusion of appropriate information assists the General Practitioner in planning the patient's future rehabilitation in order to optimise their recovery and participation in the community. The discharge reports are written by junior doctors and training was identified as a key factor in improving the content of the reports. Since conducting the audit, this training has been incorporated into the junior doctors training and induction in Rehabilitation Medicine. In order to assess if improvements have been made it is recommended that the audit is repeated.

Audit on the use of antiepileptic drugs following traumatic brain injury

I. Hai, R. Hanspal

Musgrove Park Hospital, Taunton, Somerset, TA1 5DA, UK

Introduction. Seizures risk is increased after traumatic brain injury (TBI). Following TBI, seizures are classified as 'early' (within 7 days) or 'late' (after 7 days). There is evidence that prophylactic antiepileptic drugs (AEDs) reduce the incidence of early seizures, but there is no evidence on reduction of late seizures. The aims of the audit were: 1) To identify current practice in prescribing AEDs following TBI in patients transferred to the Neurological Rehabilitation Service. 2) To establish if guidelines were being followed. **Materials and methods.** Standards were derived from the UK National Clinical Guidelines following Acquired Brain Injury (1). The Standards recommend: 1) AEDs should be discontinued after 7 days if prescribed in patients with no seizures or with seizures within 48 hours following TBI. 2) If late seizures occur, AEDs should be prescribed, monitored and long term AED treatment plans documented. Retrospective review of medical notes of randomly selected patients admitted to our service following TBI over a 3 year period was undertaken. **Results.** Total number of patients – 17. Early seizures – nil patients. Late seizures – 3 patients. No seizures – 14 patients. Three patients were prescribed prophylactic AEDs. In only one of these patients AEDs were discontinued after 7 days. All patients with late seizures were prescribed AEDs. In only 2 of the 6 patients prescribed AEDs, the treatment was monitored and long term plans documented. **Conclusion.** No consistent pattern of prescribing AEDs following TBI was identified. The key areas that need to improve are the appropriate use of prophylactic AEDs and documentation of a monitoring and follow up plan. This audit indicates that the recommended standards are currently not being followed and a repeat audit is planned.

References

1. Rehabilitation following acquired brain injury. National Clinical Guidelines. Royal College of Physicians; British Society of Rehabilitation Medicine 2003.

The International Classification of Functioning, Disability and Health (ICF) in Vocational Rehabilitation and Disability Assessment in Slovenia

P. Ptyushkin, G. Vidmar, H. Burger, Č. Marinček

Multidisciplinary Research Network on Health and Disability in Europe (Murinet), University Rehabilitation Institute, Republic of Slovenia, Ljubljana, Slovenia

Introduction. ICF is a new framework to be used in different health-related areas, including vocational rehabilitation. In 2004, the Vocational Rehabilitation and Employment of Persons with Disabilities Act made the use of ICF obligatory for the assessment of persons with disabilities and development of rehabilitation programs for work reintegration in Slovenia. The study illustrates the use of the ICF in vocational rehabilitation in Slovenia. **Materials and methods.** A survey was developed, and group and individual interviews were conducted with professionals involved in vocational rehabilitation in order to collect their opinion about ICF. The majority of ICF users in vocational rehabilitation in Slovenia were covered. **Results.** The vast majority of the respondents believed that ICF helps to create a common language for the multidisciplinary communication. The main advantages of the ICF identified by the respondents were that it provides a holistic view of the person, assesses complexities of functioning, provides a unified language, and offers quick and easy insight into functioning. The exposed disadvantages of ICF were complicated terminology and subjective influence of the assessor. Additional qualitative analysis of the users' understanding of ICF and its purpose revealed heterogeneity. Significant differences between public and private organisations were found. **Conclusion.** ICF is a promising tool for use in vocational rehabilitation and disability assessment in Slovenia. A major challenge is the lack of interface between ICF and policies regarding vocational rehabilitation in Slovenia.

References

1. Fatur-Videtič A., Hibar I. First experiences with introducing ICF in vocational rehabilitation in Slovenia. Presentation for MHADIE conference, Ljubljana, November, 22-25, 2006.
2. Kvale S. Interviews. An Introduction to Qualitative Research Interviewing. Thousand Oaks, CA: Sage Publications Inc; 1996
3. Zakon o zaposlitveni rehabilitaciji in zaposlovanju invalidov (Vocational Rehabilitation and Employment of Persons with Disabilities Act). Official Gazette of the Republic of Slovenia No. 16/2007, available from <http://www.uradni-list.si/1/objava.jsp?urlid=200716&stevilka=720>

Evaluation of the effects of Selective Rehabilitation on the Patients with Chronic Low Back Pain

M.A. Shakoor, A.K.M. Salek, M. Tariqul Islam, Md. Moyeenuzzaman
Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Introduction. Chronic low back pain (LBP) is the most common cause of long term disability in middle age in many countries. Back symptom is the most common disability in patients under the age of 45 years. Abnormalities in the lumbar spine are common and degenerative changes virtually be found in all older people. There are many methods of management of LBP. Chronic LBP is resistant to treatment, and patients are often referred for multidisciplinary treatment. Current multidisciplinary bio-psychosocial rehabilitation regards disabling chronic pain as the result of multiple interrelating physical, psychological, and social or occupational factors. To find out the effects of selective rehabilitation on chronic LBP an effort was made to make the disabled patients into working one. **Materials and methods.** A total of 139 patients were selected and divided randomly into two groups. Group-A was treated with NSAID and selective rehabilitation and Group-B was treated with NSAID only. NSAID in the form of tablet Naproxen (250mg) twice daily orally after meal was given in both the groups. Selective rehabilitation treatments in the form of activities of daily living instructions, assistive devices and exercise were given in group-A only. Assessment of the patients was done by Visual Analogue Scale, Schober's test, Oswastry Disability Index and Modified Zung Index. Student's 't' test and Chi-squared test was done as required to see the level of significance. **Results.** Improvement was found in both the group of patients having chronic LBP after treatment (P = 0.001). But in comparison, more improvement was found in the patients receiving selective rehabilitation treatment (p = 0.001). **Conclusion.** Rehabilitation treatment may play an important role to reduce the disability of the patients with chronic LBP.

Rehabilitation after anterior cruciate ligament reconstruction related to graft choice

M. Bacchini, C. Rovacchi, M. Rossi

"Don Carlo Gnocchi" Foundation, ONLUS, "S. Maria ai Servi" Center, Parma, Italy

Introduction. There are various surgical procedures for ACL reconstruction and various rehabilitation protocols. As both patellar tendon (PT) and hamstring (HS) grafts are used for ACL reconstruction, it is clinically relevant to understand the biomechanical differences in knee function associated with each graft (1). **Materials and methods.** Eight patients with ACL injury, who underwent ligament reconstruction surgery with patellar tendon grafting (PT) (mean age, 28 ± 3 years), and eight ACL-reconstructed patients with an semitendinosus and gracilis tendon autograft (HS) (mean age, 29 ± 3 years) volunteered to participate in the present study. These patients were assessed between the 5th and 7th month postsurgery with clinical-anamnestic investigation, including the Hughston Clinic subjective knee questionnaire, and by gait analysis with EL.I.Te. optoelectronic system, two dynamometric platforms and dynamic electromyography. **Results.** The patellar tendon patients (PT) presented a reduced knee flexion angle. These patients demonstrated a reduced external knee flexion moment at mid-stance whilst patients with hamstring grafts (HS) had a reduced external extension moment at terminal-stance. **Conclusion.** The patients who had undergone patellar tendon (PT) anterior cruciate ligament reconstruction to 6 months from the intervention must avoid chain exercises open kinetics, while produce incrementally augment graft tension in proportion to greater angle flexion (2). These results suggest that there are graft-specific differences in knee biomechanics after ACL reconstruction that appear to relate to the donor site.

References

1. Synder-Mackler L., Delitto A., Bailey S.L., Stralka S.W. Strength of the quadriceps femoris muscle and functional recovery after reconstruction of the anterior cruciate ligament. J. Bone Joint Surg. (Am) 1995;77-A:1166-73.
2. Li G, Del Frate L.E., San H., Gill T.J. In vivo elongation of the anterior cruciate ligament and posterior cruciate ligament during knee flexion. Am. J. Sports Med. 2004;32:1415-20.

Nerve block in the management of the upper motoneuron syndrome. Result of musculocutaneous Neurolysis with Phenol

F. Medina Estévez, J. Sanchez Enriquez, M. E. Santandreu Jimenez, L. Méndez Suarez, G. Miranda Calderín.

Servicio de Rehabilitación, Complejo Hospitalario Universitario Insular Materno-Infantil, Las Palmas de Gran Canaria, Spain

Introduction. The aim of this study is to determine if the nerve block with phenol is useful in the treatment of spasticity following a upper motoneuron injury in flex elbow spasticity. **Materials and methods.** We have conducted a prospective study including 16 patients who had flex elbow overactivity, secondary to upper motor neuron injury. The population is distributed in stroke, traumatic brain injury and multiple sclerosis etiology. The parameters that were evaluated were: modified Ashworth Scale; frequency spasms by the scale of Penn. **Results.** The results were as follows with respect to the tone, find significant differences between the initial measurement and after 3 and 6 months of treatment, respect to the frequency of spasms significant differences were found. **Conclusion.** Therefore, the musculocutaneous nerve block with phenol, could be considered a useful technique for the treatment of spasticity in patients who require large doses of botulinum toxin, that exceed the amount described as a maximum.

References

1. Young RR. Treatment of spastic paresis. *N Engl J Med* 1989;320:1553-5.
2. Souza R. Oliveira. Motor hemiplegia and the cerebral organization of movement in man: I. The pyramidal concept: a restatement. *Arq Neuropsiquiatr* 1989;47(1):8-15.
3. Fonecca ST, Holt KG, Saltzman E, Fetters L. A dynamical model of locomotion in spastic hemiplegic cerebral palsy: influence of walking speed. *Clin Biomech (Bristol, Avon)* 2001;16(9):793-805.
4. Meythaler JM. Spastic hypertonia. Appendix. *Phys Med Rehabil Clin N Am* 2001;12(4):953-6.
5. Milia PJ, Jackson ADM. A controlled trial of baclofen in children with cerebral palsy. *J Int Med Res* 1977;5:398-404.
6. Ofluoglu D, Esquenazi A, Hirai B. Temporospacial parameters of gait after obturator neurolysis in patients with spasticity. *Am J Phys Med Rehabil* 2003;82:000-000.

Responsive technology in rehabilitation of children with cochlear implant

A. Rega, M. Caretti

Department of Relational Science "G. Iacono", University Federico II, Natural and Artificial Cognition Laboratory, Naples, Italy

Introduction. The last decades have seen considerable changes in cognitive rehabilitation. New kinds of equipments and rehabilitation tools such as computer software, intelligent toys and robots seems to be corner the market of tool for rehabilitation. Our goal is obtain a cognitive rehabilitation system that train a basic instrumental cognitive function embedded in a complex behavioural skills, by interaction with real objects in real world. **Materials and methods.** We created a prototype system, called "Anima". it allow to "give life" to daily use's objects (toys, utensils, carpets, furniture, walls, etc.). When humans come into contact with an object, through a tool like glove or wand, the environment react emitting sounds, words, phrases, movies or activating some devices (lighting of lamps, opening / closing doors, etc.). A first case study of the system will involve the rehabilitation of children with cochlear implant or auditory prosthesis, allowing therapist (or parents) to animate easily objects and distribute them in any enclosed space (a room of games, a gymnasium, therapeutic setting, etc.), to perform exercises of vocabulary acquisition and object based story telling. The goal is try to maintain high motivation to rehabilitation, allowing the humans to come into contact with many stimuli in a playful and autonomous way. Thanks to interaction, human becomes an active part that explores and manipulates objects of a live environment, the surround respond with changes which stimulates human's sensory level (visual, auditory, etc.). **Results.** In the light of our preliminary observations the training became more attractive for child, but to assert if the prototype improve the vocabulary acquisition and catalyze trainer's attention on the tasks we will analyze data coming out from the future experiment. **Conclusion.** During this year, the responsive technology served a lot of halt care application, but all was interactive and supportive for specific handicap, in our case we have to create a prototype to rehabilitate and not to support cognitive dysfunctions. So we will assess the power of this technology in rehabilitation actions.

References

- Crawford J. (1998). Assessment of attention and executive functions. Neuropsychological rehabilitation, 8.
- Lund HH, Marti P. Designing Manipulative Technologies for Children with Different Abilities, *Journal Artificial Life and Robotics*, 2005;9:175-187, Publisher Springer Japan.

Detrusorial injections of Botulinum Toxin in overactive bladder due to multiple sclerosis: 10 year experience

E. Andretta¹, C. Zuliani², E. Cossaro¹, C. Fattorello², G. Artuso¹

¹*Urology Unit, General Hospital Dolo (Venice)*

²*Neurology Unit, General Hospital Mirano (Venice)*

Introduction. We report our experience with detrusorial injections of botulinum toxin (ITox) in overactive bladder (OB) due to multiple sclerosis (MS). **Materials and methods.** From 2000 to 2009 15 subjects (12 females; age 30-72, mean 46 years) underwent ITox. Twelve patients used clean intermittent catheterisation (CIC). Videourodynamics confirmed OB in all. All subjects kept voiding diaries; urgency and quality of life (QoL) were evaluated by visual analogical scales (1-5 no urgency-serious urgency; 1-5 QoL very poor-QoL excellent). Botox 300 IU were used despite of 5 cases (100-200 IU to maintain micturitions). **Results.** Patients were evaluated at 15 days and subsequently as needed (average follow-up 47 months, range 2-121). In all cases we observed significant reduction of urgency (mean from 4.4 to 1.4) and in pads used (from 3.2 to 0.5/day) while QoL improved (from 1.3 to 4.2). 5/8 subjects, in whom the post-void residual (PVR) pre-treatment was superior to the voided volume (VV), became unable to void. In 3/8 cases, with PVR inferior to VV, the number of micturitions/day decreased by 50% with an average increase of 30% in VV and an average reduction of CICs from 2.6 to 1.6/day. Three women - with OB at high pressures - maintained spontaneous micturitions without PVR, with decrease in frequency (from 12 to 6.7/day) and increase of 100% of bladder capacity. ITox effects lasted on average 8.4 months (range 4-14), and 9/12 patients repeated them successfully (average 3.9 times, range 1-9). **Discussion.** ITox is effective in OB, also if due to MS. Furthermore ITox transformes incomplete urinary retention into complete whenever pre-treatment PVR was superior to VV. In women able to void ITox can resolve OB without compromising complete voiding. **Conclusion.** ITox is a mini-invasive therapy which dramatically improves the QoL of patients with MS by suppressing urgency and urinary incontinence. The urologist can foresee its results considering voiding modalities.

References

1. Schulte-Bauklok H, Schobert J, Stolze T, Sturzebecher B, Weiss C, Knispel HH. Efficacy of botulinum-A toxin bladder injections for the treatment of neurogenic detrusor overactivity in multiple sclerosis patients: an objective and subjective analysis - *Neurourol Urodyn* 2006;25(2):110-115.
2. Fowler CJ, Panicker JN, Drake M, Harris C, Harrison SCW, Kirby M et al A UK consensus of the management of the bladder in multiple sclerosis - *J Neurol Neurosurg Psychiatry* 2009 80; 470-477.

Osteoporosis in patients with multiple sclerosis: proposed therapeutic and diagnostic protocol

Y. Dionysiotis^{1,3*}, P. Papaioannou³, G. Lyritis³, D. Kiourtidis², A. Karvouni², I. Kliafas²

¹*Rehabilitation Department*

²*Neurologic Department, Rhodes General Hospital, Rhodes, Greece*

³*Laboratory For Research Of The Musculoskeletal System, University of Athens, Kifissia, Greece*

Introduction. Despite the increased number of risk factors in patients with multiple sclerosis (MS) there are no guidelines on the measurement of bone density and also there is no real ranking system similar to that for postmenopausal women. Therefore we think would be more appropriate to use the term low bone mass instead of osteoporosis or osteopenia and also take into account the Z-score obtained from the measurement of bone densitometry. Although in the international literature the term osteoporosis is used and patients are classified according to criteria by WHO for postmenopausal women. **Materials and methods.**

The diagnostic evaluation for osteoporosis should include: the patient's history (disease-attendant complications, drug-using corticosteroids, alcohol, smoking and information about the duration of the disease, the mobilization, the use of devices); anthropometric para-

meters (age, body mass index); clinical examination (clinical assessment of mobility-functionality and spasticity); imaging control (measured by DXA bone density in the spine, hip and / or the tibia p QCT); hormone control, biochemical control (markers of bone turnover blood and urine). **Results.** Treatment is focused at osteoporosis treatment and prevention of future fractures and may include the following: 1) Pharmaceutical treatment with bisphosphonates that have been studied in patients with brain and spinal cord lesions and had positive effects on bone parameters; 2) use of calcium supplements (under monitoring of kidney function) and vitamin D; 3) Advisory regarding the disease, the particularities of this population group and recognition of fractures; 4) Education to prevent falls; 5) Physical therapy program that includes: a) range of motion exercises to avoid restriction of mobility, b) loading exercises to reduce bone loss, c) retraining standing and therapeutic walking with orthoses, d) use of passive – active mobilization bicycle; 6) Dietary interventions to improve the dietary intake of calcium and nutrition indicators. **Conclusion.** Based on the literature regarding osteoporosis in MS we suggested a diagnostic and therapeutic protocol assessment and treatment of osteoporosis in patients with multiple sclerosis

Greek guidelines of hellenic institution of osteoporosis with respect to the exercise of osteoporosis and falls

Y. Dionyssiotis on behalf of Hellenic Institution of Osteoporosis (HELIOS)

Rehabilitation Department, Rhodes General Hospital, Rhodes, Greece

Introduction. Although exercise is used on a widespread basis, in postmenopausal osteoporosis has not yet significant evidence-based data. These Greek guidelines with respect to the exercise of osteoporosis and falls emerged from an extensive review of the literature of the subject. Where specialized studies lacking we preferred to refer to the opinion of experts. **Materials and methods.** The effect of exercise on bone mineral density is side specific. For this reason, the exercises should be selected to focus in clinical points of interest. (A) Aerobic exercise is effective in reducing the loss of bone density in the spine and wrist. (A) The exercise should be intensive (i.e. capable of producing significant ground reaction forces, repetitive and in short time). (C) The muscle strengthening exercises are effective in reducing bone loss while the increase in muscle strength is associated with regional increase in bone density and is maintained for a short to moderate time duration. (A). **Results.** Although the exercise has proven benefits, the ideal type of exercise, duration and intensity to prevent falls is an area not yet fully clear. (B). **Conclusion.** Exercises that improve balance, including Tai Chi, are effective in population groups at highest risk of falling. (A)

Study of spinal orthoses in postmenopausal women

Y. Dionyssiotis^{1,2}, G. Michas¹, A. Galanos¹, G. Trovas¹, G.P. Lyrinis¹

¹Laboratory for Research of the Musculoskeletal System, University of Athens, Kifissia, Greece

²Rehabilitation Department, Rhodes General Hospital, Rhodes, Greece

Introduction. We investigated the efficacy and the compliance of spinal orthoses in postmenopausal women. **Materials and methods.** We planned a 2 year perspective study including 50 community dwelling postmenopausal women above 50 years, with established osteoporosis and/or an angle of kyphosis more than 55 degrees. Women were separated in group A (n=20, using rigid orthosis Spinomed / Spine-x), group B (n= 20, using elastic multifunctional orthosis Osteomed, Spinomed active) and group C (n=10, women who denied the use of orthosis). Women of groups A and B were asked to wear the orthosis for at least 2 hours/day for 12 months. All women receive pharmacotherapy. We measured anthropometric values (age, height, weight, body mass index) and calculated isometric maximum strength of trunk muscles (Force(F)/Weight(W)_{abdominals}, F/W_{extensors}) with ISO-RACK device (Digimax, AechaTronic, Germany) and we assessed back pain with visual analogue scale (VAS). In addition women completed a compliance questionnaire. **Results.** Women of group A were significant older and felt more pain (72.3±8 vs.61±10.5 and 65±16.5 vs.45±16.5, p=0.015 and p=0.014, respectively, at the beginning of the study but had similar strength (ns) compared with group C. The compliance of wearing orthosis for 6 months was 66%. Spinomed decreased significantly pain (41±17.3 vs. 65±16.5, p=0.001) and increased trunk muscle

strength (F/W_{abdominals} 197.8±82.7 vs. 131.2±53.7, p=0.005 and F/W_{extensors} 246.3±59.5 vs.197.6±48, p=0.003). **Conclusion.** These preliminary results suggest that orthoses could be an effective intervention for back pain and muscle strengthening in osteoporotic women.

References

1. Pfeifer M, Begerow B, Minne HW. Effects of a new spinal orthosis on posture, trunk strength, and quality of life in women with postmenopausal osteoporosis: a randomized trial. *Am J Phys Med Rehabil* 2004;83:177-86.
2. Vogt L, Hübscher M, Brettmann K, Banzer W, Fink M. Postural correction by osteoporosis orthosis (Osteo-med): a randomized, placebo-controlled trial. *Prosthet Orthot Int.* 2008 Mar;32(1):103-10.
3. Hildebrandt HD, Vogt L (2002) Der "Osteoporosebody" – eine multifunktionale Orthese. *Orthopädie-Technik* 2, Februar 53.

Review of rehabilitation practice in a specialist in-patient setting

R. Hanspal, I. Hai

Musgrove park Hospital, Taunton, Somerset,TA1 5DA, UK

Introduction. The British Society of Rehabilitation Medicine (BSRM) standards (1) are currently the recommended standards for in-patient rehabilitation practice in the UK. The aim of the review was to establish if the our service meets these standards. **Materials and methods.** The standards chosen were: 1. Rehabilitation should be provided by a multidisciplinary (MDT) team. 2. There should be defined and publicised referral criteria. 3. Patients should have appropriate induction and their care plans completed within 24 hours. 4. Patients should be actively involved in goal setting. 5. Patients should have a keyworker. 6. Goals should be reviewed at least fortnightly. 7. Outcome measures should be documented at discharge and audited. 8. Long term outcomes should be recorded using validated measures. Data regarding our current practice was collected and compared with the above standards using a Standards Proforma. **Results.** Rehabilitation is provided by a MDT. The service has an operational policy in place including referral criteria. All patients receive induction and care plans are completed within 24 hours. Goals are set regularly but patients are not actively involved in goal setting. Goals are reviewed weekly by the MDT. A key worker is allocated for all patients. Outcome measures are documented and audited. Long term goals are recorded but validated measures are not used. **Conclusion.** This review identifies areas of good practice and other areas that require improvement. The service needs to be better publicised enabling effective use of resources. Patients should be actively involved in goal setting and long term outcomes should be documented using validated measures. We plan to repeat the review after implementing the above changes.

References

1. British Society of Rehabilitation Medicine. Standards for in-patient rehabilitation. May 2002

The use of serum biomarkers to predict outcome following mild traumatic brain injury

A. Michalak, J. Topolovec-Vranic, M.A. Pollmann-Mudryj, D. Ouchterlony, A. Romaschin*, C. Masanic, D. Klein, J. Spence, A. Baker**

St. Michael's Hospital, Trauma & Neurosurgery Program, Head Injury Clinic, Division of Clinical Chemistry, Department of Critical Care, Toronto, Ontario, Canada

Introduction. The purpose of this study was to examine whether the use of a simple screening tool, the Galveston Orientation and Amnesia Test (GOAT) in conjunction with the measurement of S100 calcium binding protein B (S-100B) and Neuron-Specific Enolase (NSE) proteins in patients with mild traumatic brain injury (mTBI), would reliably and accurately predict patients who could be discharged from ongoing medical care related to brain injury at 6 week post-injury^{1,2}. **Materials and methods.** In this prospective cohort study patients arriving to the ED with a suspected mTBI were screened for: non-penetrating mTBI; ED arrival within 4 hours of the injury; 18-65 years of age. Patients were administered the GOAT and a blood sample was collected for biomarker testing. Participants returned for further assessments at 1 week, 6 weeks and 12 weeks post-enrollment. **Results.** A total of 135 patients were enrolled into the study (mean age, 39.9 years), 62% male. At the time of enrollment the mean Glasgow Coma Score was 14.9 and the mean GOAT score was 91.2. Elevated levels of S100B and NSE were observed for 53% and 58% of the cases, respectively. These data have been used

to develop a prediction model of outcome following mTBI at 1-, 6-, and 12-weeks post-injury. **Conclusion.** Preliminary results indicate that a simple screening tool in conjunction with the measurement of serum biomarker levels could be used as an adjunct tool in an ED setting to assist in predicting outcome following mTBI.

References

1. Guzel A., Serum neuron-specific enolase as a predictor of short-term outcome and its correlation with Glasgow Coma Scale in traumatic brain injury, *Neurosurgical Review*. 31(4):439-44; discussion 444-5, 2008 Oct.
2. Naeimi ZS, Predictive value of S-100B protein and neuron specific-enolase as markers of traumatic brain damage in clinical use, *Brain Injury* 2006 May; 20(5):463-8.

Quality of life and physical activity after total knee replacement

F. Januário^{1,2}, J.P. Pinheiro^{1,2}, F. Fonseca^{2,3}

¹Department of Physical Medicine and Rehabilitation, Coimbra University Hospital, Portugal

²Faculty of Medicine of Coimbra University

³Department of Orthopaedics, Coimbra University Hospital, Portugal

Introduction. In patients with severe knee osteoarthritis, the total knee arthroplasty (TKR) is an effective treatment by reducing pain and improving function. The study purpose is to assess the function, quality of life and physical activity of patients with a TKR. **Materials and methods.** Transversal, non-randomized clinical study with 32 patients with unilateral total knee prosthesis for more than one year, 22 women and 10 men, mean age 65.66 ± 2.85. It was used the validated Portuguese versions of the Short-Form (SF)-36, Knee injury and Osteoarthritis Outcome Score (KOOS) and short-form of International Physical Activity Questionnaire (IPAQ). **Results.** Around 46.9% of the patients have a high physical activity and 34.4% have a moderate physical activity from IPAQ. Comparing SF-36's scores of the sample with the Portuguese population, there were significant differences between them in the physical dimension. The KOOS pain and activities of daily living function had a significant correlation with the physical dimension of SF-36; KOOS other disease-specific symptoms, KOOS knee-related quality of life and IPAQ vigorous-intensity activities correlated with the physical and mental dimensions; KOOS sports and recreation function depended on physical dimension and social functioning; IPAQ walking and IPAQ total only correlated with physical function. **Conclusion.** These patients' perceptions of quality of life are decreased, mostly due to the status of physical health, in spite of maintain a good physical activity.

References

- Nilsdotter AK, Toksvig-Larsen S, Roos EM A 5 year prospective study of patient-relevant outcomes after total knee replacement. *Osteoarthritis Cartilage* 2009;17:601-606.

The effect of botulinum toxin on cervical dystonia

I. Stankovic, J. Stamenovic, L. Dimitrijevic, H. Colovic

Clinic for Physical Therapy and Rehabilitation, Clinical Center, Nis, Serbia

Introduction. The aim of this work was to analyze the effect and duration of effect of botulinum toxin in cervical dystonia (CD). **Materials and methods.** Prospective study comprised 14 patients with CD that were divided in two groups. The first, control group had five patients treated with physical therapy. The second group had nine patients treated with single dose of 500 units of botulinum toxin A (BTA), with subsequent physical therapy. The effect of therapy was evaluated after one, three, and six months using Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS) and Torticollis Rating Scale (TSUI). **Results.** Application of BTA resulted in highly significant improvement of all analyzed parameters in TWSTRS scale after one month. After three months the values of investigated parameters were lower, but also highly significant. After six months significant improvement was verified, with longer duration and higher significance for disability and pain subscales. TSUI scale confirmed the most important improvement after one month, with retained of results after three months. After six months the most of analysed parameters were better, except for duration of sustained movements and head tremor. No important side effects of treatment were noticed. **Conclusion.** TWSTRS and TSUI scale have confirmed highly significant improvement of all the parameters of cervical dystonia treated with botulinum toxin A after one and three months, and significant improvement after six months.

References

1. Kaji R, Osawa M, Yanagisawa N. Inter-rater reliability while using the Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS) in patients with cervical dystonia. *Brain Nerve*. 2009;61:65-71.
2. Cano SJ, Hobart JC, Fitzpatrick R, et al: Patient Based Outcomes of Cervical Dystonia: A Review of Rating Scales. *Mov Disord*. 2004;19:1054-1059.

The Effect of Calf Stretching Box in Stretching Calf Muscle Compliance: a Prospective, Randomized Single-Blinded Controlled Trial

N. Chadchavalpanichaya¹, G. Srisawasdi², A. Suwannakin³

¹Clinical instructor, Department of Rehabilitation Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

²Clinical instructor, Department of Rehabilitation Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

³Foot clinic Nurse, Department of Rehabilitation Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Introduction. The conventional calf muscle stretching method (leaning into the wall with the affected leg placed behind the contralateral leg, bending the front knee, keeping the back knee straight) can cause some complications in the elderly such as knee pain result in decreasing patient's compliance. "Calf stretching box" is new innovation. Patients step forefoot on and lean forward. We hypothesized that using calf stretching box can increase compliance, decrease muscle tightness and decrease complications when compared with the conventional method. **Materials and methods.** Between April and August, 2009, 80 patients who were more than 45 years old with calf muscles tightness were enrolled in the study. Patients were randomized into 2 groups, the study group (using calf stretching box) and the control group (stretching by the conventional method). Patients in both groups were asked to hold the stretch for at least 1 minute and to perform the program at least 2 times per day, everyday for two weeks. They were asked to record the real frequency and duration of their performing exercise and the complications in a log book everyday. **Results.** Thirty-eight patients in each group completed the study. The baseline characteristics were similar. The study group had higher frequency and longer duration of performing exercise than the control group. They also reported more decrease of calf muscle tightness with less pain complication (p<0.05). **Conclusion.** Stretching calf muscle with calf stretching box can increase compliance, decrease calf muscle tightness and decrease complications when compared with the conventional exercise method.

References

- Chadchavalpanichaya N, Srisawasdi G, Suwannakin A. The Effect of Calf Stretching Box in Stretching Calf Muscle Compliance: A Prospective, Randomized Single-Blinded Controlled Trial. (Plan to be published in *J Med Assoc Thai*).

Tenderness of the neck muscles predicts future pain of young adults – a 6-year follow-up of adolescents with and without headache

K. Laimi^{1,2}, J. Pitkänen¹, T. Vahlberg³, L. Metsähonkala^{4,5}, J.J. Salminen¹

¹Department of Physical and Rehabilitation Medicine, Turku University Hospital, Finland

²Department of Public Health, University of Turku, Finland

³Department of Biostatistics, University of Turku, Finland

⁴Department of Child Neurology, Helsinki University Hospital, Finland

⁵Department of Child Neurology, Turku University Hospital, Finland

Objective. The objective of the study was to determine whether headache (HA) or co-occurrent neck pain (NP) in the adolescence predicts future HA or NP of young adults. **Materials and methods.** As a part of a follow-up of schoolchildren with and without HA, 16-year-old adolescents went through a thorough clinical examination. Of these adolescents, those with HA at least three times a month (N=40/47) and those with no HA (N=20/22) were interviewed by phone 6 years later at the age of 22 years. **Results.** Frequent HA remained frequent in 19 of 40 HA sufferers and weekly NP remained weekly in 12 of 14 NP sufferers. Palpation pain of the neck muscles (the sternocleidomastoid, masseter, upper trapezius and posterior neck muscles), self-reported HA and NP at the age of 16 years were associated with the frequency and the intensity of HA and NP at the age of 22 years. **Conclusion.** As co-occurrent NP in adolescent HA sufferers was predicting NP and HA later in young adulthood, pre-

venting and treating adolescent NP can offer an important tool in the prevention of chronic adult pains.

Spinal Cord Injuries: a new motor rehabilitation approach

R. Albertazzi¹, C.A. Arcangeli², M. Morandi¹, G. Lazzeri²

¹U.O. Medicina Fisica e Riabilitazione Ospedale di Rovereto, Ala

²Istituto privato di Medicina Fisica e Riabilitazione Centro Giusti, Firenze

Introduction. Authors propose a new motor rehabilitation approach for the motor rehabilitation treatment of spinal cord injured Patients, both in the post – acute and chronic phase : the intense and continuative R.I.C. created in 1994 by Centro Giusti of Florence, Italy. **Materials and methods.** R.I.C. motor rehabilitation consists in an organized and constant rehabilitation work defined by: an intense daily commitment (4/6 hours per day) shared by specialized Physiotherapists; a personalized programme including active work up and under the injury and a therapeutic (and/or functional) walking, performed with the weight on the lower limbs (not in suspension) and small, under knees braces and a walker ; a rehabilitation continuity expressed by the therapy periods at Centro Giusti alternated to a rehabilitation programme to perform at home. **Results.** Some videos are presented that show the functional motor performances achieved by spinal cord injured Patients suffering different levels and types of injury: It is also examined the case of a quadriplegic subject (A.S.I.A. A) treated at Centro Giusti and at U.O. di Riabilitazione Ospedale di Ala. **Conclusion.** According to the experience with about 400 spinal cord injured Patients an organized, intense and continuative motor rehabilitation work leads to motor and functional results and, therefore, to psychological ones as well, that allow spinal cord injured subjects to improve the quality of life, and to get more possibility of reintegration in the social/economical life.

References

- Harnes ET, Yozbatiran N et al. ;Effects of intense exercise in chronic spinal injury. *Spinal Cord* – Novembre 2008-46, 733-737.
Harvey LA, Lin C, Glinsky JV, De Wolf A. The effectiveness of physical interventions for people with spinal cord injuries: a systematic review. *Spinal Cord*, 2009;47(3):184-95.

Assessment of the effects of application of radiofrequency 0.485 MHz by using capacitive - resistive system in the muscle tissues through crossover double blind study

M. Tofanicchio¹, C. Tranquilli², G. Annino³, M. Hawamdeh¹, G. Della Bella¹, B. Contini¹, P. Broccoli², S. Ceccarelli², E. Fanucci², S. D'Ontavio⁴, Bernardini³, Calogero Foti¹

¹Department of the School of Specialization in Physical Medicine and Rehabilitation, University of Rome "Tor Vergata", Italy

²Department of Diagnostic Imaging University of Rome "Tor Vergata", Italy

³Department of Clinical Biochemistry University of Rome "Tor Vergata", Italy

⁴Human Performance Lab "Bosco C.", Degree in Kinesiology, University of Rome "Tor Vergata", Italy.

⁵Department of Traumatology and Sports Rehabilitation - Institute of Medicine and Science in Sport "A Venerable" - CONI - Rome, Italy

Introduction. The purpose of this study is to assess the possible effects on muscle performance after application of a 0.485 MHz radio frequency through the use of a system to transfer energy capacitive-resistive on healthy muscle tissue, according to a standardized protocol. **Materials and methods.** The apparatus TECAR[®], which uses the physical principle of the condenser, TECAR[®] can work in two methods, capacitive, resistive. Ten persons were included aged 20-30 years. The 10 subjects were divided randomly into 2 groups according to treatment modalities: 1. Group A) cases group: evaluation of blood parameters, power-Doppler examination and assessment of muscle parameters of muscle performance on a footboard. (Ergojump, BoscoSystem, RI), protocol TECAR[®] on is applied on quadriceps muscle bilaterally. 2. Group B) control group: Evaluation of blood parameters, power-Doppler examination and assessment of muscle parameters of muscle performance on a footboard (Ergojump, BoscoSystem, RI), protocol TECAR[®] off (placebo). The

Protocol (TECAR[®] on) used for this study consists of three phases: 10 min capacitive; 10 min resistive; 5 min capacitive. **Results.** By measuring of ultrasound spot which was observed in subjects that treated by the protocol has been observed an average increase (A.I) of statistically significant spots. The data obtained can be seen also as there was an average increase (A.I), statistically significant, the parameters of CPK, Myoglobin and lactate in both treatment groups but that we have detected a minor increase in subjects treated by the protocol. **Conclusion.** an increase of Intramuscular capillary blood flow and allowing a minor impact on myofibrils structures subjected to mechanical stress generated intensive eccentric work of the tests.

Gait pattern in patients with central cord syndrome

A. Gil-Agudo¹, A. Forner-Cordero², E. Pérez-Rizo¹, S. Pérez-Nombela¹, B. Crespo-Ruiz¹, A. del Ama-Espinosa¹, C. de Miguel-Benadiba³

¹Biomechanics and Technical Aids Department. National Hospital for Spinal Cord Injury. SESCAM. Toledo. Spain.

²Bioengineering Group. Consejo Superior de Investigaciones Científicas (CSIC). Madrid. Spain

³Physical Medicine and Rehabilitation Department. Hospital Ramón y Cajal. Madrid. Spain

Introduction. One of the most frequent and clearly defined clinical syndromes of incomplete SCI is central cord syndrome (CCS) (1). Ambulation is a realistic goal in many of these patients. Very few studies have reported gait kinematics analyses conducted on subjects with CCS (2). The aim of this study was to analyze the gait kinematics characteristics of subjects with central cord syndrome (CCS) and to compare findings with a healthy age, sex and anthropomorphically matched control group (CG). **Materials and methods.** Twelve CCS patients and a CG with twenty subjects were analyzed. Kinematic data were obtained using a three-dimensional motion analysis system. Temporal, spatial variables and kinematic variables (maximum and minimum lower limb joint angles throughout the gait cycle in each plane, along with the gait cycle instants of occurrence and the joint range of motion, ROM) were compared between the two groups walking at similar speeds. **Results.** Hip abduction and knee flexion at initial contact as well as minimal knee flexion during stance were larger in the CCS group (p<0.05). However, knee and ankle ranges of motion (ROM) in the sagittal plane were greater in the CG group (p<0.05). The maximal ankle plantar-flexion values in stance phase and at toe off were larger in CG (p<0.05). **Conclusion.** The gait pattern of CCS patients showed a decrease of knee and ankle sagittal ROM during level walking and an increase of hip abduction to increase base of support. The findings of this study help to improve the understanding how CCS affects gait changes in the lower limbs.

References

- McKinley W, Santos K, Meade M, Brooke K. Incidence and outcomes of spinal cord injury clinical syndromes. *J Spinal Cord Med* 2007;30(3):215-24.
- Krawetz P, Nance P. Gait analysis of spinal cord injured subjects: Effects of injury level and spasticity. *Arch Phys Med Rehabil* 1996;77:635-8.

Effects of Selective Rehabilitation in Cervical Spondylosis- a Clinical Trial.

A. Shakoor, S. Rahman,

Bangabandhu Sheikh Mujib Medical University

Introduction. Cervical spondylosis is a clinical syndrome characterised by osteophytosis, narrowing of intervertebral joint spaces and foramina and compression of the nerve roots and spinal cord. The use of physical therapies exercises and aids & appliances are widely used to treat this conditions. The objective of this comparative study was to see the superiority of selective techniques over nonsteroidal anti inflammatory drugs (NSAID) in the management of cervical spondylosis. **Materials and methods.** A total of 173 patients were included in the study and were randomly divided into two equal groups. *In group A* 85 patients were treated with selective rehabilitation program in the form of exercise, neck support, cervical traction, warm moist compression and instruction in posture. *In group B* 88 patients were treated with NSAIDs only. Before admission into the trial, verbal consent of the patients were taken. The findings were recorded at first attendance and followed up weekly for six weeks. Statistical analyses were done by using SPSS package for Windows. Student's 't' tests were done to test the hypothesis. **Results.** Only 72 patients in group A and 78 patients in group B completed the treat-

ment. Rest 23 patients were dropped during the treatment. In group A, the numerical data of pretreatment and after treatment assessment scores were compared statistically and found highly significant ($p=0$). In group B, $p = 0.001$. This result indicates that improvement in group A was slightly better than in group B at the end of six weeks. **Conclusion.** Selective rehabilitation techniques using physical therapies, exercises and activity modification were found to have better outcome in the management of cervical spondylosis than use of NSAIDs drugs which have potential side effects.

Toward the development of new rehabilitation strategies: Bilateral Transfer of motor skill learning in stroke patients

C.D. Ausenda¹; M. Carnovali².

¹Department of Rehabilitation, A.O. Ospedale San Carlo Borromeo, Milano, Italy

²Department of Rehabilitation, Ospedale di Passirana, A.O. Garbagnate, Milano, Italy

Introduction. Bilateral transfer of a motor skill is a phenomenon based on the observation that the performance of a skill with one hand can “teach” the same skill to the other hand. In this study we tested the ability of bilateral transfer to facilitate the motor skill of the paretic hand in patients that suffered a stroke. **Materials and methods.** In a randomized trial we studied 20 patients, who had their first stroke episode characterized by a brain lesion to a single hemisphere. The criteria used for the selection were based on a physical examination, the time elapsed from the stroke and cognitive requirements. The experiment consisted in training the healthy hand of each patient from the test group to execute the nine hole peg test 10 times a day, for 3 consecutive days, and then test the paretic hand with the same test and bimanual tasks. The control group was not trained but went through the same test. **Results.** The homogeneity of the two groups has been proven. In the test group we found that the execution speed of the nine hole peg test with the paretic hand, after training the healthy hand, was on average 22.6 % faster than the value recorded at baseline. The training had a positive effect on the execution of bimanual tasks. Meanwhile, no significant difference was found in the control group. **Conclusion** This is the first evidence that bilateral transfer of motor skills is present in patients that suffered a stroke, and that it improves the ability of the affected hand. This observation could open the way to the development of a new approach for the rehabilitation of stroke patients.

References

Bray, CW. Transfer of learning. *J. Exp. Psychol.* 1928;11:443-467.
Iacoboni M, Mazziotta JC. Mirror neuron system: basic findings and clinical applications. *Ann Neurol* 2007;62:213-218.

Prevention of synkinesis by biofeedback therapy

Abbasali Pourmomeny¹, Hassan Zadmeher², Maryam Meirshamsi³

¹Department of physical therapy, Isfahan University of Medical Science, Isfahan University, Isfahan, Iran

²Neurology ward of shariati hospital, Isfahan, Iran

³Kashani Hospital, Isfahan University, Isfahan, Iran

Introduction. Synkinesis is a sequel of facial nerve palsy. It usually begins 3-4 months after axonal regeneration and progressed up to two years afterward (1;2). Treatment of synkinesis is very difficult and sometimes impossible. Most of treatment such as surgery, physiotherapy and botulinum toxin injection are not usually successful(3). The aim of our study is find a better procedure to treat facial nerve palsy and prevent synkinesis. **Materials and Methods.** In clinical trial, Twenty nine patients with facial nerve palsy were selected by electrodiagnosis tests(4). They were allocated in two groups. The experimental group was treated by biofeedback electromyography. The control group was treated by routine physiotherapy. **Outcome Measures.** The evaluation of all patients was performed by Photoshop assessment and facial grading scale(5) before and after treatment. By Photoshop assessment the affected side was compared with the normal side by using image and analysis computer during four different state of facial expression. **Results.** Comparing results, there was significant difference between both groups after treatment ($P<0.05$). Also, Photoshop software analysis after treatment showed significant general improvement in both groups ($p<0.05$), but experimental group showed a better result than the control group. Thirty

one percent of patients in experimental group did not show synkinesis, however, in control group 16% of patient did not demonstrate synkinesis. The number of patients with synkinesis as well as the severity of their synkinesis in experimental group were lesser than the other one. **Conclusion.** Biofeedback therapy is more efficient than common physiotherapy in facial nerve palsy. By using this approach, control and reducing synkinesis is more feasible. Assessment by Photoshop procedure is more objective than facial grading scale. So, during rehabilitation, the accuracy of Photoshop assessment is better than facial grading system.

References

1. May Mark. management of facial hyperkinesis,overview of hyperkinesis. In: May M SB, editor. the facial nerve. 2th ed. New york: Thieme; 2000. p. 431-9.
2. Cronin GW, Steenerson RL. The effectiveness of neuromuscular facial retraining combined with electromyography in facial paralysis rehabilitation. *Otolaryngology - Head & Neck Surgery* 128(4):534-8, 2003 Apr.
3. Nakamura K. etal. Biofeedback rehabilitation for prevention of synkinesis afre facial palsy. *Otolaryngology Head & Neck surgery* 2003;128(4):539-43.
4. Sittel C, Stennert E. Prognostic value of electromyography in acute peripheral facial nerve palsy. *Otol Neurotol* 2001 Jan ;22(1):100-4 2001 Jan;22:100-4.
5. Kanerva M. Sunnybrook and house - brackmann grading systems: intrarater repeatability and interrater agreement. *Otolaryngology - Head & Neck Surgery* 2006;865-71.

Comparison between magnetotherapy and diclofenac sodium in chronic low back pain

B. Marjanovic

Primary Health Care Center “Dr Simo Milosevic”,Belgrade,Serbia

Objective. The aim of this study was to asses the efficacy of using magnetotherapy in comparison with oral intake of diclofenac sodium(100mg)in treating chronic low back pain. **Materials and methods.** The study was conducted from September 2009, to January 2010.160 patients with cronic non specific low back pain were randomly assigned into two group with 80 patients in each.First group received magnetotherapy(50hz,30 minutes),on lumbar region,while patients in the second group received oral diclofenac sodium (100mg) once daily.The variable assessed were pain relief depending on VAS,and disability over ten treatment days. **Results.** After ten days of treatment we found:the pain relief was higher in magnetotherapy group ,than diclofenac sodium group,lateral trunk flexibility improved more in magnetotherapy group.After ten follow up days,pain relief extended more in magnetotherapy group,while the disability was more reduce in magnetotherapy group.

Conclusion. Magnetotherapy in management of chronic non specific low back pain found to be superior to diclofenac sodium.

Evaluation of the coefficient of correlation and of meaningfulness between dipendent and independent variables in the analisis of step through electronic baropodometry. Confrontation between sports practitioners and neurological patients suffering from podalgia

R. Schiffer¹, F. Scoppa²

¹Professor, Master degree course in Posturology

²Neuroscience, Scientific Coordinator and Professor, Master degree course in Posturology, Department of Neurology and ORL, First Faculty of Medicine and Surgery, Sapienza University of Rome Laboratory of Biometry and Digitalised Posturology, Optoelectronic Hospital, Cuneo.

Department of Neurology and ORL, First Faculty of Medicine and Surgery, Master degree course in Posturology, Director: Prof. Amabile, Giuseppe A., Sapienza University of Rome, Italy

Objective and design. The aim of this study is to evaluate the difference in the length of stride between subjects suffering from podalgia who practice sports and parkinsonians, and the static correlation between the length of step with shoes (Sws), height and age of subjects **Setting.** Work has been carried out on 40 patients, selected according to accurate criteria, patients have been divided into two groups of 20 subjects each, sports practitioners and parkinsonians. All people included in the study show plantar pain, diagnosed as: navicular-cuneiform peri-arthritis and metatarsalgia. For all of them Morton’s neuroma has been excluded through ultrasound scan examination and MRI where in doubt. The instrumental evaluation of gait has been conducted with the aid of a baropodometric board (© Milletrix). **Results and conclusions.** Results have shown a bet-

ter average value of Sws in subjects practicing sports. No significant degree of association has been detected between: height and length of stride between the two groups; age and length of semi-step in parkinsonians. On the contrary, a moderate and non casual association with age relating to length of stride, has been detected in subjects practicing sports. There doesn't seem to be any significant statistical correlation between height and length of stride either in subjects practicing sports or in parkinsonians, nor between age and length of Sws in parkinsonians. A moderate and non casual association has been found, on the contrary, for age and length of stride, in subjects practicing sports.

References

1. Static and dynamic baropodometry to evaluate patients treated by total knee replacement with a mobile meniscus. Bergami E, Gildone A, Zanoli G, Massari L, Traina GC. *Chir Organi Mov.* 2005 Oct-Dec;90(4):387-96. English, Italian.
2. Interpretation of the quantitative data of the computerized baropodometry in normal subjects . De Oliveira GS, Greve JM, Imamura M, Bolliger Neto R. *Rev Hosp Clin Fac Med Sao Paulo.* 1998 Jan-Feb;53(1):16-20. Portuguese.
3. Trattato di Medicina Fisica e Riabilitazione. Vol. 1°, Cap.6 .Boccardi S. "Fisiologia del cammino " UTET Torino 2000.

Comparison between Chin tuck exercise and stabilizer exercises on the Forward head posture correction

A.H. Bakhtiary, R. Mohammadi, B. Panahande, S. Fatemeh Mir-Hojati *Physiotherapy Group, Rehabilitation Faculty, Semnan University of Medical Sciences, Semnan, Iran.*

Introduction. Forward head posture (FHP) is one of the most common faulty postures which is the head will be positioned anteriorly related to the shoulders. It may cause several complications such as temporomandibular joint dysfunction, headache, reduced vital capacity and malfunction in upper limb circulation. In chronic situation, it may induce, muscle strain, disc herniation and cervical vertebra column instability. As the neck stabilization reduced in the FHP patients, this study has been designed to examine the effect of added stabilizing exercise to the chin tuck exercise to find any benefit effect from this new exercise protocol for FHP correction. **Materials and methods.** 47 female students with FHP were randomly assigned in one of the two experimental groups, stabilizer group (performing stabilizer plus chin tuck exercise, n=24) or control group (performing only chin tuck exercise, n=23). Volunteers in each group fulfilled their exercises protocol twice daily for 4 weeks. The amount of forward head was measure before, immediately after 4 weeks intervention and after 3 months follow-up. **Results.** The results showed significant reduced FHP in both stabilizing (P<0.0001) and control (P=0.03) groups. After 3 month follow-up, the results normal head posture in the stabilizer group (P=0.005), while the amount of FHP in control group return to its initial values (P=0.09). The comparison of the FHP mean changes between both experimental groups indicated more beneficiary effect of stabilization exercise protocol after intervention (P=0.001) and also after 3 months follow-up (P<0.0001). **Conclusion.** The results from this study show the added stabilizing exercise to the chin tuck exercise not only provide better correction effect for FHP patient, but also it may provide more effective and stable corrected posture. More study may be needed to investigate the effect of single stabilizing exercise protocol on the forward head posture correction.

Dynamic splinting of the non-functional spastic upper limb in stroke; a case report.

J.W.G. Meijer

Revant Rehabilitation Centers, Rehabilitation Center Breda, Breda, the Netherlands.

Introduction. Half of all hemiplegic stroke patients are left with a non-functional arm. In these patients, secondary complications, such as pain, hygienic problems and even a clenched fist are frequent and influencing quality of life. Treatment of spasticity is necessary to prevent this. In this case report, treatment of spasticity will be discussed and dynamic splinting is introduced. **Materials and methods.** We present a 50 yrs old female patient, for 7 yrs known with a leftside spastic hemiplegia after stroke. There was a progressive contracture of the wrist and finger flexors despite of tizanidine use combined with botulinum toxin injections and physiotherapy. Because of severe pain and increase of muscle tone she only wore the static orthosis for 2-3 hrs/day inspite of 6-8 prescribed. Finally, a

surgical procedure had to be performed. Although uncommon, contractures returned. A custom made dynamic orthosis with Ultraflex joint was provided to attack spasticity and contractures by low load prolonged stretch . Muscle tone (Ashwort scale (AS)), passive range of motion of the finger flexors, pain and hand hygien were evaluated. **Results.** Before wearing the dynamic orthosis, AS was 2-3, there was a progressive contracture of finger flexors leading to severe pain and problems to maintain hand hygien. After slow and carefull starting of dynamic bracing, she could wear the orthosis for 8 hrs/day without pain. After 4 months, muscle tone gradually decreased to AS 1, pain was absent and muscle length of the finger and wrist flexors increased to extension of wrist and fingers to 0 degrees, after 1 year 30 degrees dorsal flexion became possible. Hand hygien was no problem anymore. **Conclusion.** An integral individual approach is necessary to treat patients with severe spasticity of the arm after stroke. Dynamic bracing is an elegant, patient friendly option when static bracing is not endured.

Epidemiology of associated conditions in children with cerebral palsy in Kosova

????
????

Introduction. Cerebral palsy (CP) is often associated with neurological and sensorial impairments that worsen the disable condition and inhibit development of the communication problems due to the primary damage of the brain. **Objective.** We sought to determine the frequency with which impairments are associated with CP and to define the relationship in terms of gender, aetiology, pathophysiology, and topographical parameters. **Materials and methods.** A retrospective survey using standard questionnaires for clinical examination of children with CP treated at the University Clinical Centre of Kosova (UCCK) in Prishtina, over a 5-year period, 2000-2005 **Results.** A total of 154 children (aged 7-15 years) with CP, treated at the UCCK over the period 2000-2005 were enrolled. Epilepsy (40.91 %) was frequently associated with CP, with the spastic quadriparetic group being most affected. Vision (22,73%) and hearing (11,69%) impairments are more common in people with cerebral palsy than in the general population. Children who suffer severe hearing impairments, often have a delay in developing language skills due to the lack of auditory conditions required for normal language development. Roughly 38.96%, of children who have CP, are intellectually impaired. **Conclusion.** Cerebral palsy in Kosovo should be significant issue for medical and educational facilities and for society as a whole. Treatment for individuals with cerebral palsy requires a multidisciplinary approach in order to minimize disability and communication problems worsened by associated impairments.

References

- Kwong KL, Wong SN, So KT: Epilepsy in children with cerebral palsy. *Pediatr Neurol* 1998 Jul;19(1):31-6.
- Tilton AH, Butterbaugh G. Mental retardation and cerebral palsy. In: Noseworthy JH, ed. *Neurological Therapeutics: Principles and Practice.* New York, NY: Martin Dunitz; 2003:1617-1629.
- Uvebrant P, Carlsson G. Speech in children with cerebral palsy. *Acta Paediatr.* 1994;83:779.

Predictive factors of Future Rehabilitation Need

M. Saltychev¹, K.Laimi^{3,4}, T. Oksanen², J. Pentti², J. Vahtera^{2,3}

¹Department of Rehabilitation, Turku University Hospital, Turku, Finland

²Finnish Institute of Occupational Health, Helsinki, Finland

³Department of Public Health, University of Turku, Turku, Finland

⁴Department of Physical and Rehabilitation Medicine, Turku University Hospital, Turku, Finland

Introduction. The objective of the study was to determine predictive factors of future need for in-patient multidisciplinary rehabilitation in working population.

Materials and methods. Participants were derived from Finnish Public Sector Study. Predictive factors for future rehabilitation were collected from the baseline questionnaire and national registers. Of 49,264 respondents 2,844 participated in rehabilitation courses during a mean follow up of five years. **Results.** Many significant socio-demographic, work- and health-related risk factors for future rehabilitation need were found and will be presented. **Conclusion.** Future rehabilitation need can be predicted years before actual rehabilitation intervention, which could be helpful in primary preven-

tion, but also in the selection of right people to the type of rehabilitation they would benefit most from.

References

1. Suoyrjo H, Hinkka K, et al. Allocation of rehabilitation measures provided by the Social Insurance Institution in Finland: a register linkage study. *J Rehabil Med* 2007;39(3):198-204.
2. Dean DH, Dolan RC, et al. Evaluating the vocational rehabilitation program using longitudinal data. Evidence for a quasixperimental research design. *Eval Rev* 1999;23(2):162-189.
3. Millet P, K. W. Sandberg KW. Individual status at the start of rehabilitation: Implications for vocational rehabilitation programs. *Work* 2003;20(2):121-129.

Social functioning and self-esteem in young people with disabilities participating in adapted competitive sport

M. Dinomais¹, G. Gambart¹, A. Bruneau², L. Bontoux³, X. Deries¹, C. Tessiot¹, I. Richard³

¹Department of Pediatric Rehabilitation, Rehabilitation Center "les capucins", Angers, France

²Department of Sports Medicine, University Hospital of Angers, France

³Department of Physical Medicine and Rehabilitation, Faculty of Medicine, University of Angers, Angers, France

Introduction. The aim of this study was to measure social functioning quality of life and self-esteem in young people with disabilities taking part in adapted competitive sport, and to explore the correlations between the outcomes.

Materials and methods. A sample of 496 athletes (mean age 16y 4mo) was obtained from the 540 involved in a French national championship. The main outcome measurements were a social functioning inventory (Peds QL 4.0 Social Functioning) and a self-esteem inventory in physical areas (Physical Self Inventory 6). **Results.** The mean Peds QL SF score was 74.6 (SD 17.7). Comparison of Peds QL SF according to gender, age, self mobility and training revealed no significant differences. Peds QL SF was significantly correlated with all subscales of the PSI-6 in the total population. PSI scores were significantly different between boys and girls, with better self esteem for boys on general self esteem (7.7 vs 6.9, $p=0.018$), physical condition (6.8 vs 6.0, $p=0.023$) and attractive body subscores (6.5 vs 5.1, $p<0.001$). **Conclusion.** Social functioning scores were significantly higher in this population than in samples of young people (1, 2) with disabilities available in the literature, and this could indicate a positive effect of participating in adapted competitive sport on higher self-esteem.

References

1. Russo, RN, Goodwin EJ, Miller MD, Haan EA, Connell TM, Crotty M.. Self-esteem, self-concept, and quality of life in children with hemiplegic cerebral palsy. *J Pediatr* 2008; 153:473-7.
2. Varni JW, Limbers CA, Burwinkle TM. Impaired health-related quality of life in children and adolescents with chronic conditions: a comparative analysis of 10 disease clusters and 33 disease categories/severities utilizing the PedsQL 4.0 Generic Core Scales. *Health Qual Life Outcomes* 2007; 5:43.

Efficacy of low-level laser therapy and transcutaneous electrical nerve stimulation therapy on range of motion in chronic low-back pain

S. Grazio¹, B. Markulinčić², S. Muraja², F. Grubišić¹, T. Nemčić¹, V. Matijević¹, H. Skala Kavanagh¹, V. Šušak¹

¹University Department of Rheumatology, Physical and Rehabilitation Medicine, "Sisters of Charity" University Hospital, Zagreb, Croatia.

²Special Hospital for Medical Rehabilitation "Stubičke Toplice", Stubičke Toplice, Croatia.

Introduction. Low back pain is an extremely frequent medical musculoskeletal condition. Although commonly used in the treatment of musculoskeletal pain low-level laser therapy (LLLT) and transcutaneous electrical nerve stimulation (TENS) their efficacy in chronic low-back pain (CLBP) is controversial. The aim of the study was to determine and compare the efficacy of LLLT and TENS on range of motion in adult patients with CLBP. **Materials and methods.** Sixty patients with CLBP (duration >3 months) of both sexes (30 women and 30 men) aged 51.48±11.48 years, were assigned to either LLLT (wave-length 808 and 905 nm, power of 1650 mW) or TENS (100-150 Hz). Therapy was administered in lumbar region daily for 5 days per

week, to a total of 15 sessions (3 weeks). All patients performed exercise program. Efficacy assessment obtained at baseline and at the end of treatment included modified Schober's measure (mSM) for lumbar flexion and fingertip to floor distance for lumbar side flexion (LSF). Apart from descriptive statistics, t-test was used to assess difference between the two groups and between baseline and post-therapeutic data. **Results.** The baseline measures were as follows: mSM 3.63±0.99, right LSF 50.23±7.97, left LSF 49.57±7.71, while measures at the end of treatment were: mSM 4.21±0.96, right LSF 47.75±8.59, left LSF 46.97±8.54. The baseline level of range of motion did not differ between two study groups (mSM $p=0.015$, right LSF $p=0.873$, left LSF $p=0.817$). At the end of the treatment both LLLT and TENS groups exerted improvement in all measures of lumbar spine mobility, which was statistically significant for all measurements ($p<0.01$) but with no differences between groups (mSM $p=0.011$, right LSF $p=0.755$, left LSF $p=0.720$). **Conclusion.** In our sample of middle-aged patients with chronic low-back pain, LLLT and TENS, along with other rehabilitation treatments, improved lumbar range of motion, with no difference between them.

Manual mechanic coccydynia treatment.

R. Gatto, M.L. Tenaglia

Clinica S. Rita, Vercelli

Introduction. The pains in the sacrum-coccygeal area, of various intensity, from a little nuisance to a serious disabling pain, often afflict people of every age, especially women. These pains are too often referred to as "Coccydynia" or "Coccyx Pain", even if they can represent symptoms of several diseases or disorders. Examining a patient who refers this kind of symptoms it is necessary to recognize if it is real coccydynia. The majority of AA consider the post-traumatic (mechanic) type as coccydynia, giving the concept of trauma a wide meaning, including frequent micro-traumas, overweight and sedentariness. **Materials and methods.** A three year prospective survey (2007-2009) with an external observer, has involved 126 patients of both sex, aged 17 to 84 years. These were picked out basing on the diagnosis of mechanical coccyx pain from a wider pattern of patients affected by sacrum and anus-rectal pains of different etiology. The aim of this survey is to evaluate short and long term efficacy of the manual treatment based on the R. Maigne technique dedicated to the mechanical coccyx pain. **Results.** The outcomes are positive, as the follow-up data reveal, regarding to pain intensity (VAS scale) and quality of living (SF-36 scale). Another datum, not of secondary aim in this survey, is referred to the high frequency in which coccyx pain reveals itself associated with other PMID (Painful Minor Intervertebral Dysfunction) or takes part in the ATZs R. Maigne syndrome (Associated Transition Zone syndrome). **Conclusion.** In this case it's frequent that an inefficient or incomplete recovery from coccyx pain is linked to frequent relapses of PMID, through a self-kept postural imbalance. This confirms the importance of the dysfunctional factor in this disorder and the use of the manual medicine treatment.

References

- R. Maigne Ma technique pour le traitement des coccygodinies d'origine mécanique, *Revue de Médecine Vertébrale* 18, Mars 2006, Paris.

The study of triaxial torque output and electromyographic activity of selected trunk muscles during generation of pure and combined exertions in upright standing in asymptomatic subjects and patients with chronic low back pain

G.R. Olyaei, S.J. Mousavi, S. Talebian, M. Parnianpour

Physical Therapy Department, Rehabilitation Faculty, Tebran University of Medical Sciences, Tebran, Iran

Introduction. Combined motions of trunk at varying exertion levels occur in most daily and occupational activities and are important risk factors of low back pain. Few studies have investigated trunk capability, controllability and trunk muscle activation patterns during multidirectional activities with different exertion levels. **Objectives.** To investigate the effect of biaxial isometric exertions on the maximum capability of trunk and to examine the effect of angle and level of isometric exertion on trunk controllability and trunk muscle activation patterns during the tracking task in upright posture. **Materials and methods.** Eighteen asymptomatic and five patients with chronic low back pain performed isometric contrac-

tions of trunk muscles in 8 angles and 3 levels of exertion. The EMG activity of ten selected trunk muscles was collected in the three seconds end-point matching tasks in 8 angles and 3 levels of exertion. The tracking system included a target, which was a thick line with a round endpoint. Subjects were asked to track the target line (path) and match the endpoint while maintaining torque for 3 sec by exerting isometric contraction against B200 Isostation. The initial part of the tracking task was named path tracking phase and the final part, end-point matching phase. Trunk capability was determined by measuring peak torque values obtained during maximal voluntary exertions. Trunk controllability was determined by measuring constant error and variable error during tracking tasks. Trunk muscle activation patterns were examined using root mean square of normalized electromyographic signals (NRMS-EMG) and using EMG polar plots. Analysis of variance with repeated measures design was used to test the effects of angle and level of exertion on trunk capability, controllability and trunk muscle activation patterns. The percentage difference between healthy and low back pain (LBP) subjects regarding constant error, variable error and mean index of spatial focus was shown descriptively. **Results.** Trunk capability was significantly decreased during biaxial exertions ($p < 0.001$). Constant error and variable error were significantly affected by angle ($p < 0.001$) and level ($p < 0.001$) of exertion during both phases of the tracking task. Angle and level of exertion significantly affected NRMS-EMG of all muscles studied. The index of spatial focus was not changed with increasing exertion magnitude in most of the muscles studied. Descriptively, mean index of spatial focus was lower in patient with LBP than asymptomatic subjects in most muscles and three levels of exertion. **Conclusion.** Trunk capability and controllability were significantly decreased during biaxial exertions. Higher exertion levels had a major negative impact on trunk controllability in both uniaxial and biaxial exertions. The index of spatial focus indicated that probably no shift to a higher co-contraction strategy has been adapted with increasing exertion magnitude. No statistical analysis was performed to compare asymptomatic subjects and patient with LBP; however, the mean index of spatial focus was lower in the patients, as shown with percentage difference. The results suggested that combined exertions and more strenuous efforts may impair trunk neuromuscular control, increasing the risk of low back pain.

Changes In Locomotor Functioning After Repetitive Locomotor Training In Patients Affected By Cerebral Palsy

P. Bonetti^{1,2}, A. Cosentino², A. Waldner³, S. Hesse⁴, C. Geroin¹, C. Werner⁴, M. Gandolfi¹, N. Smania¹

¹Department of Neurological and Visual Sciences, University of Verona, Verona, Italy

²"C. Santi" Rehabilitation Center, Verona, Italy

³Villa Melitta, Bolzano, Italy

⁴Medical Park Berlin, Charité-University Medicine, Berlin, Germany.

Introduction. The reduced gait performance in children affected by Cerebral Palsy (CP) leads to low levels of social relationships and life quality. Gait training with robotic body weight support systems have shown to be effective in adult patients suffering from neurological diseases. The aim of this study was to test the effectiveness of a robotic gait training in children suffering from CP. **Materials and methods.** 18 children with CP were randomly assigned to an experimental (EG) or a control group (CG). The EG underwent 30 minutes of robotic gait training plus 10 minutes of joint mobilisation and stretching exercises. The CG received 40 minutes conventional physiotherapy. Both groups received 10 daily treatment sessions over a 2 weeks period. Patients were evaluated before, after treatment, and in a 1 month FU by means of: 6 minutes walking test (6 MWT), 10 metres walking test (10 MWT), "Gait quality questionnaire" (GQQ), WEE-FIM scale and Gait Analysis. **Results.** After treatment, the EG showed significant improvements in the 6MWT ($p = .008$) and in the "Fluidity" sub-item of the GQQ ($p = .0014$). At follow-up, the EG maintained a stable improvement in the 6MWT ($p = .012$) and in the "Fluidity" sub-item ($p = .001$) while improvements in the "Safety" ($p = .014$) sub-items of the GQQ, in hip extension at initial foot contact ($p = .028$), at middle stance ($p = .008$) and at initial swing ($p = .005$) were first documented at follow-up. Patients of the CG didn't show any improvement in any outcome measures. **Conclusion.** The study showed that locomotor therapy by means of a robotic gait training device could improve gait endurance and some qualitative subjective gait parameters in patients with CP. Only minor improvements can be achieved in gait kinematic parameters.

References

Pohl M, et al. Repetitive locomotor training and physiotherapy improve walking and basic activities of daily living after stroke: a single-blind, randomized multicentre trial (DEutsche GANgrainerStudie, DEGAS). Clin Rehabil 2007.

Effects of Sensori-Motor Integration Training on Balance Impairment in Patients with Multiple Sclerosis

D. Munari¹, E. Ceriani¹, C. Fontana¹, M. Casarotto¹, M. Benedetti², A. Fiaschi³, M. Gandolfi¹, N. Smania¹

¹Department of Neurological and Visual Sciences, University of Verona, Verona, Italy

²Neurologic Clinic, Policlinico G.B. Rossi Hospital, Verona, Italy

³I.I.R.C.C.S., San Camillo, Venezia, Italy

Introduction. Balance impairment, a major cause of disability in people with Multiple Sclerosis, have a complex physiopathology involving mainly deficit in somatic sensation and defective integration of sensory (visual, somatic and vestibular) inputs. To evaluate the effectiveness of a balance training program based on tasks aimed at increasing the efficiency of the neural mechanism of integration of sensory inputs. **Materials and methods.** 24 patients with multiple sclerosis suffering from balance impairment were randomly assigned to an experimental or to a control group. Experimental treatment was a training aimed at increasing the patient's balance control under different sensory conflict conditions. Control treatment consisted of joint mobilization, muscle stretching, strength, and motor coordination exercises. Fifteen 50-minute treatment sessions over a 2 weeks period (5 sessions/week) were performed. Before, at the end and 15 days after the end of treatment, patients were evaluated by blinded raters by means of: Berg Balance Scale, Activities-specific Balance Confidence Scale, Fatigue Severity Scale, stabilometric assessment and gait spatio-temporal parameters. **Results.** After the experimental treatment patients showed significant improvements in all clinical and instrumental outcome measures which were maintained for 30 days after the end of the treatment. No significant changes in performance were observed in the control group except for an increase in the double support time during gait. **Conclusion.** A rehabilitation training aimed at increasing the patient's balance control under different sensory conflict conditions can improve postural stability in patients with multiple sclerosis.

References

Cattaneo D, Jonsdottir J. Sensory impairments in quiet standing in subject with multiple sclerosis. Multiple Sclerosis 2008; 00: 1-9.

Cattaneo D, et al. Effects of balance exercises on people with multiple sclerosis: a pilot study. Clin Rehabil 2007.

Smania N, et al. Rehabilitation of sensori motor integration deficits in balance impairment of patients with stroke hemiparesis: a before/after pilot study. Neurol Sci 2008.

Prediction of outcome of low back pain intervention by 3 objective measures

????

????

Introduction. To examine the validity of Waddell's signs (WSs) and three objective screening tests: 5-Position Grip test, Rapid Exchange Grip test (REG) and a Lifting test, in predicting the outcome of treatment for patients with back pain. There is a need for surgeons and physiotherapists to be more informed in their decision making for treatment and in determining whether there are factors that may hinder their patients' progress. A consecutive sample of 123 patients between the ages of 20 and 60 years old with chronic low back pain referred from a physiotherapy or orthopaedics department. **Materials and methods.** Subjects were categorised into a consistent (CG) or inconsistent group (ICG) by Waddell's signs. Each subject received the three screening tests. Outcome following treatment intervention was measured by the Oswestry Disability Questionnaire (ODQ). **Results.** The 5-Position Grip test in the dominant hand was significantly associated with treatment outcome at 6 and 9 months follow up and, in the non-dominant hand, was associated with treatment outcome at discharge and at 3 months. The REG test in the non-dominant hand was associated with treatment outcome at 3 months follow up. Neither the REG test in the dominant hand, Lifting test or Waddell signs were associated with treatment outcome at any time point. **Conclusion.** This study further confirms the lack of predictive validity of the Waddell signs. The 5-

Position Grip Test in the dominant hand was most consistently associated with treatment outcome. It might therefore be an appropriate prognostic test to guide intervention choice and progress. In this study the results of the 5-position Grip Test in the dominant hand is shown to enable practitioners to predict the outcome of treatment intervention and can be used as an appropriate prognostic test in Chronic Low Back Pain patients to assist in decision of choosing an efficient intervention.

References

Abdolkarim Karimi, Barbara Richardson; School of Rehabilitation Sciences, Isfahan University of Medical Sciences, a_karimi@rehab.mui.ac.ir

Acupuncture in subjects affected by acute neck and brachialgic pain related to cervical spinal disc herniation or protrusion, with or without spinal stenosis: results of an open-label clinical trial

A. Boccignone, A. Bertolini

U.O.C. Medicina Fisica e Riabilitazione P.O. Portogruaro (Venezia) U.L.S.S. 10 Veneto Orientale

Introduction. We evaluated the response to acupuncture in subjects affected by acute and subacute neck and/or brachialgic pain related to cervical spinal disc herniation or protrusion. **Materials and methods.** From May 2005 to December 2009 we enclosed in our trial all the subjects who we observed with an acute and subacute neck and/or brachialgic pain correlated with cervical spinal disc herniation or protrusion diagnosed by MRI; sometimes MRI showed evidence of spinal stenosis. In the anamnesis of some patients there was evidence of a traumatic injury. We considered sex, age and duration of the symptoms with their mean values and standard deviation. We performed 8 sessions of acupuncture in two weeks using these points: BL 10, GV 13 and 15, GB 20 and 21, LI 4. Every session lasted 20 minutes and we stimulated the needles after 10 minutes. We evaluated pain with VAS (1) and the range of motion (ROM) of the neck (2) before the treatment (a), at the end (b) and after 6 months (c). During the study neither anti-inflammatory drugs nor physical or kinetic therapies were administered to the patients. We administered only Tramadol and we measured its consumption in the first and in the second week. We analyzed our results by Wilcoxon signed rank test. **Results.** 78 patients, 21 males and 57 females, 19 with spinal stenosis and 28 with anamnestic traumatic injury, MeanAge51,77±15,31. The duration of the symptoms before the treatment was 30,21±15,93 days. MeanVAS(a)8,70±1,09; MeanVAS(b)2,46±2,52; MeanVAS(c)2,55±2,81 (p<0.0001). Mean consumption of Tramadol 1st week 653,95mg±297,14; 2ndweek268,42±253,73 (p<0.0001). Mean ROM of the neck in extension, flexion, right and left lateral inclination and rotation had improved after acupuncture (p<0.0001). **Conclusion.** Acupuncture in acute and subacute neck and brachialgic pain related to cervical spinal disc herniation or protrusion may be useful.

References

1. Scott J, Huskisson EC. Pain,2:175-184,1976.
2. Troisier O. E.M.C. Roma-Parigi-Medicina Riabilitativa,26008G10,12.1990.

Ergonomic chair: spatial exploration in cervical and dorso-lumbar spinal cord injury patients

M. Saccavini^{1,3}, S. Odelli², F. Lauretani¹, C. Foti³, M. Franceschini⁴

¹Geriatric-Rehabilitation Department, Azienda Ospedaliero-Universitaria, Parma, Italy

²ASS N.4 Medio Friuli; Istituto di Medicina Fisica e Riabilitazione, Udine, Italy

³University of Rome Tor Vergata; Assistive Technology Doctoral Degree, Rome, Italy

⁴Neuro-Rehabilitation Department, IRCCS San Raffaele, Pisana, Rome, Italy

Introduction. Spinal Cord Injury (SCI) is one of the most invalidating conditions, occurring mainly in younger cohorts of population, especially for traumatic accidents. Rehabilitation programs adopted around the world are all centered on functional aims. Aim of this study is assessment of the static and dynamic parameters of mobilization in patients affected by SCI to understand which rehabilitation program could improve in these patients daily living activities and/or to quality of life (QoL). **Materials and methods.** We evaluated 34 patients (17 paraplegic and 17 tetraplegic; age-range 26-55 years; 27 male and 7 female) affected by traumatic accidents.

Mean time confined to a wheelchair was 10 years, for all these patients. We assessed static parameters, such as distance of the acromio-clavicular articulation to the ground floor and those from the upper level of the head to the ground floor, main distance reached forward, main distance reached laterally, extension of the upper extremities. **Results.** Paraplegic patients showed an higher distance of the acromioclavicular articulation to the ground floor and those to the upper level of the head from the ground floor, compared to tetraplegic patients. Even the abduction at 90° and the flexion at 45° and 90° of the shoulder are statistically different between paraplegic and tetraplegic patients. Tetraplegic patients are constantly inclined laterally from the main axis of the wheelchair with an higher trunk flexion, compared to paraplegic patients, which are constantly attached to chair back using dominant arm. The main distance reached forward is constantly higher for paraplegic compared to tetraplegic patients and even the extension of the upper extremities as result of a higher activity of the trapezium muscle. **Conclusion.** Efforts should be addressed to evaluate static and dynamic muscle parameters of post-traumatic patients affected by SCI and in the ergonomics term.

Balance and mortality in older persons

F. Lauretani¹, M. Maggio², S. Bandinelli³, L. Ferrucci⁴, G.P. Ceda², M. Saccavini¹

¹Geriatric-Rehabilitation Department, Azienda Ospedaliero-Universitaria, Parma, Italy;

²Department of Internal and Biomedical Sciences, Section of Geriatrics, University of Parma, Parma, Ital;

³Geriatric Rehabilitation Unit, Azienda Sanitaria di Firenze (ASF, Florence, Italy);

⁴Longitudinal Studies Section, Clinical Research Branch, NIA-IRP, National Institutes of Health (NIH), Baltimore, MD, USA.

Introduction. Balance is considered a clinical marker of several neurological diseases in older persons. Recent studies show that minor neurological signs, that could be related to a poor balance, are associated with a high risk of falls, hospitalization, and risk of dead. Aim of this study was to determine whether poor balance is associated with increased mortality among older adults. **Materials and methods.** Longitudinal study among 854 adults, 65 years and older free of major neurological diseases and with no IADL-disability, in the InCHIANTI study, a population-based cohort of adults living in the community in the Tuscany region, Italy. **Results.** During eight years of follow-up, 184 (21.5%) of participants died. Eight-year survival was lower in the lowest compared with the highest group of the balance score (P <0.0001 by Mantel-Haenszel chi-square). In a multivariate Cox proportional hazards model adjusted for age, sex, grip strength, NCV, Physical Activity, CSAM, CHF, Cancer, COPD, Knee Arthritis, Foot Pain, adults in the higher balance score at enrollment had lower mortality compared to those with lower balance score (Hazards Ratio was 0.85, 95%; CI 0.73-0.99; p=0.03). **Conclusion.** Poor balance is an independent risk factor for mortality among older adults living in the community.

Gonadal status and physical performance in older men

F. Lauretani¹, M. Maggio², S. Bandinelli³, L. Ferrucci⁴, G.P. Ceda², M. Saccavini¹

¹Geriatric-Rehabilitation Department, Azienda Ospedaliero-Universitaria, Parma, Italy

²Department of Internal and Biomedical Sciences, Section of Geriatrics, University of Parma, Parma, Ital

³Geriatric Rehabilitation Unit, Azienda Sanitaria di Firenze (ASF, Florence, Italy)

⁴Longitudinal Studies Section, Clinical Research Branch, NIA-IRP, National Institutes of Health (NIH), Baltimore, MD, USA

Introduction. Male aging is characterized by a progressive decline in serum testosterone levels and physical performance. Low testosterone levels may facilitate the development of poor mobility which in turn, may affect disability. During recent years, many consensus reports have been developed to define hypoandrogenism in the adult population. However, in older population, the cut-off levels of serum testosterone that are associated with determinants of physical performance have not been identified. We investigated if measures of physical performance in older men are affected by gonadal status. **Materials and methods.** We evaluated 410 >65 year old men of InCHIANTI study a population based study in two muni-

cipalities of Tuscany, Italy with complete data on testosterone levels, hand grip strength and short physical performance battery (SPPB). Testosterone was assayed using commercial radioimmuno-logic kits with minimum detection limit of 0.86 ng/dL. Linear regression models were used to examine the relation between total testosterone levels and determinants of walking (grip strength and SPPB).

Results. According to baseline serum levels of total testosterone, three different groups of older men were created: 1) severely hypogonadal (N= 20) with serum total testosterone levels <230 ng /dl; 2) moderately hypogonadal (N=75) (total testosterone >230 and <350 ng/dL), and 3) eugonadal (N=297) with serum testosterone levels > 350 ng/dL. In the age and BMI adjusted analysis, a significant difference in haemoglobin levels, MMSE score, hand grip strength and SPPB score (p for trend<0.001) was observed among the three groups, with severely hypogonadal men having lower values of haemoglobin, MMSE, muscle strength and physical performance. In a fully-adjusted analysis grip strength were significantly lower in severely hypogonadal men compared to the other two groups. **Conclusion.** In older men, hypogonadal status defined as testosterone levels below 230 ng/dl is associated independently with impaired grip strength.

Efficacy of botulinum toxin injection with and without electromyographic assistance for the treatment of spasticity

D. Varvarousis, A. Ploumis, A. Beris

Rehabilitation Center "S. Niarchos", University Hospital of Ioannina, Greece

Introduction. The accuracy of intramuscular botulinum toxin injection is imperative for the efficacy of drug regimen. The aim of this study is to compare the effects of botulinum toxin injection with and without electromyographic (EMG) assistance for the treatment of spasticity. **Materials and methods.** In a prospective comparative study, botulinum toxin was injected into 27 patients with spasticity due to damage to the brain or spinal cord (stroke, TBI, SCI, CP). All spastic muscles were evaluated using the modified Ashworth scale and the average score in each patient was documented. In group A, which consisted of 15 patients (55.55%), the injection was administered with EMG assistance, while in 12 patients (44.44%) of group B without EMG assistance. All injections were conducted by the same physician. The follow-up period was 4-24 months. Injection without EMG assistance was performed with the use only of anatomic landmarks. **Results.** Spasticity was improved in all patients and new scores were 1-2 grades less according the modified Ashworth scale. No complications or side effects were noted. In group A (mean reduction of Ashworth score 1.66 – SD 0.5, 5 out of 15 patients reduced spasticity by 1 grade and 10 out of 15 patients by 2 grades). In group B (mean reduction of Ashworth score 1.25 – SD 0.46), 9 out of 12 patients reduced spasticity by 1 grade and the rest 3 patients by 2 grades. This reduction of spasticity between the two groups was statistically different ($p<0.001$). **Conclusion.** The effectiveness of botulinum toxin injection with EMG assistance is superior than without for the treatment of spasticity because of the more accurate needle positioning for injection.

References

Mayer NH, Whyte J, Wannstedt G, Ellis CA. Comparative impact of 2 botulinum toxin injection techniques for elbow flexor hypertonia. Arch Phys Med Rehabil 2008 May;89(5):982-7.

Response to different modalities in patients with fibromyalgia (FM)

A.C. Bighea, S. Patru, R. Marcu, R. Popescu

University of Medicine and Pharmacy of Craiova, Romania

Introduction. The treatment of FM is frustrating for both patients and their physicians. In general, drugs used to treat musculoskeletal pain are not of any proven benefit. Multidisciplinary approaches to management include physical and medical therapeutic strategies. We started from the hypothesis that physical therapy (including here only modalities) will reduce impairments and improve quality of life in this patient group. The objective of the study is to investigate whether a 4-week programme of physical therapy (massage, electrotherapy, hot pack, hydrotherapy) could benefit spinal pain, mobility, function and quality of life for patients with fibromyalgia. **Materials and methods.** We recruited for this study 60 women dia-

gnosed with fibromyalgia that were randomly assigned into modalities or control groups, each consisting of 30 subjects. In the control group there were no interventions, just usual care, and in the modalities group patients followed during 4 weeks a programme with different physical procedures, daily, five days/week. The back pain assessed with a visual analogue scale, functional capacity (Fibromyalgia Impact Questionnaire) and quality of life (QOL) were measured before the start and after completion of the programme. **Results.** Statistically significant improvements were demonstrated in spinal pain and functional capacity for the modalities group while the controls showed no significant changes. Subjects in the modalities group showed better satisfaction in some domains of the Short-Form-36 Health Survey quality of life questionnaire ($p=0.05$). **Conclusion.** This 4-week modalities programme could improve back pain, spinal mobility, and enhance QOL in fibromyalgic women. Future study should recruit more subjects to verify the results.

References

1. Goldenberg DL, Burckhardt C, Crofford L. Management of fibromyalgia syndrome. JAMA. 2004;292(19):2388-2395.
2. Burckhardt C, Goldenberg D, Crofford L, et al. Guideline for the Management of Fibromyalgia Syndrome Pain in Adults and Children. Glenview, IL: American Pain Society; 2005:1-109.

Complex regional pain syndrome due to Herpes Zoster

Z. Ozeri, B. Duyur Cakit, M. Sengul, S. Taskin, H. Rana Erdem

Ministry of Health, Ankara Trainig and Research Hospital, 2nd Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Introduction. Although the occurrence of CRPS like symptoms is common in subjects with herpes zoster, CRPS following zoster infection is a rare complication. We presented a case of complex regional pain syndrome (CRPS) due to a zoster infection and assessed the benefits of the treatment. **Case Report.** Subject was an 80-year-old woman. She first complained of severe pain in her left shoulder and visited emergency room. She had no history of trauma to the arm or musculoskeletal disease. Because of her deep shoulder pain, non-steroidal antiinflammatory drug and daily 300 mg of pregabalin were given. 2 days after the visit, the subject reported rash in her left arm. She visited dermatology outpatient clinic and was treated with oral acyclovir for 15 days with a diagnose of zoster infection. 2 weeks after rash onset she also complained of deep pain in her left hand and fingers. She was referred to PMR outpatient clinic. Physical examination of the patient revealed C7,C8,Th1 herpes rash. Her left shoulder ranges were within normal ranges. Severe pain, edema, redness and shiny skin were noticed in her left hand. Hyperesthesia was detected in her left hand and flexion movements of fingers of her left hand were limited. Laboratory test values were within the normative range. Total body scintigraphy showed signs of typical CRPS in her left hand. In addition, a venous Doppler of the left arm was normal. Radiographs of the both hands revealed no specific changes for CRPS. AP spine and femur neck bone mineral density were normal. She was treated with intra muscular administration of calcitonin 100 IU daily for 15 days as well as daily 300 mg of pregabalin. Rehabilitation program of the patient included protection against muscle atrophy and maintenance of range of motion. Physical therapy was also added her treatment program including hot pack, transcutaneous electric nerve stimulation and ultrasound. After 2 weeks, CRPS symptoms had become less severe and her pain become more tolerable. **Conclusion.** The treatment program including pharmacological therapy combined with rehabilitative approaches are found to be successful.

References

Zuhal Ozeri, Burcu Duyur Cakit, Mustafa Sengul, Suhan Taskin, Hatice Rana Erdem

Early rehabilitation after vukov's technique with acromioclavicular injuries in young athletes

T. Radovanovic¹, V. Vukov², M. Manojlovic-Opacic¹, E. Dubljanin¹, V. Vesovic-Potic¹, M.Zdravkovic²

¹Clinic for Physical Medicine and Rehabilitation, KCS, Belgrade, Serbia

²Institute for Orthopedic Surgery and Traumatology, KCS, Belgrade, Serbia

Introduction. Acromioclavicular injuries in athletes are very common, especially in rugby, wrestling, judo, bicycling or other sport

activities in general. In the treatment of acromioclavicular separations, in our hospital, we prefer surgery, and use it in all cases of grade 3 injuries, in some cases of grade 2 injuries, and in chronic cases of painful shoulder. In this article we report our experience in rehabilitation treatment with patients they were treated with original Vukov's technique, especially in young athletes. It is an elastic fixation on the lateral end of the clavicle with thread suture through the bone and the coracoacromial ligament below. Minimal resection (5-6 mm) of the lateral clavicle is part of the procedure. **Material s and methods.** Vukov's technique was used since 1986. With early rehabilitation we started since 2003. We treated 16 active athletes from 18 to 31 years old. There were 11 cases of grade 3 injury, 3 cases of grade 2 injury, and 2 chronic cases of grade 3 injury. We started rehabilitation on first postoperative day. The rehabilitation course was divided in three phases, and included passive, actively-assisted and active exercises with, and without resistance. Due to functional recovery of the operated shoulder the phases ended faster. **Results.** With the patients up to 26, we attained the best results: the full range of movements and painless shoulder still after 3 weeks of surgery. They returned to sport training at 4 weeks after surgery and to full sport activities after 6 weeks. We used the Constant score to evaluate our results, which revealed an excellent outcome (>90 pt). **Conclusion.** Well selected surgical procedure, and precisely directed early rehabilitation after operated acromioclavicular dislocation, yields to a complete and fast functional restoration.

References

1. Rockwood CA, Green DP. Fractures. ed 1. vol1. Philadelphia, JB Lippincott Co, 1975.
2. Neviaser RJ. Injuries to the clavicle and acromioclavicular joint. Orthop Clin North Am 1987; 18.
3. Clarke HD, McCann PD. Acromioclavicular joint injuries. Orthop Clin North Am. Apr 2000;31(2):177-87.

The effect of video-guidance on active and passive movement as assessed by fMRI: useful for rehabilitation?

M. Dinomaisa², A. Ter Minassian³, S Groeschel², M. Delion⁴, T. Tuilier⁵, S. N'Guyen⁶, C. Aubé⁵, I. Richard¹

¹Université d'Angers; Faculté de médecine; Département de Médecine Physique et de réadaptation, France

²Pediatric Neurology & Developmental Medicine and Experimental Pediatric Neuroimaging, University Children's Hospital, Tübingen Germany

³Centre Hospitalier Universitaire Angers ;pôle anesthésie-réanimation, France

⁴Université d'Angers; Faculté de médecine; Service de neurochirurgie, France

⁵Université d'Angers; Faculté de médecine; Service de radiologie, France

⁶Université d'Angers; Faculté de médecine ;Service de neuropédiatrie, France

Introduction. Passive and active movements¹ as well as action observation have a positive impact on recovery of motor function in stroke patients. Action observation with simultaneous executed movements might therefore also be a useful tool for rehabilitation. The aim of this study was to explore the neural networks involved in this approach in healthy subjects. **Materials and methods.** Using fMRI block design, right hand movement performed by 17 right handed participants with (=imitation) and without visual guidance was investigated. The movement tasks included of both active execution of movement and passive movement, imposed by the examiner. **Results.** Movement imitation caused cortical activation in bilateral occipito-temporal areas both in passive and active movement. However, only active imitation led to activation in right inferior and superior parietal lobule, left frontal areas and cerebellum, whereas passive imitation activated right prefrontal cortex and the left supplementary motor area (SMA). **Conclusion.** These preliminary results indicate that different networks are activated during active and passive imitation tasks. The networks detected in our study are known to be important for functional recovery after stroke^{2,3} and include attention, top-down control and intention for active imitation and a motor inhibitory network for passive imitation. These findings provide theoretical backing for the integration of active and passive movement with visual guidance in a new rehabilitation approach.

References

1. Oujamaa L, et al. Rehabilitation of arm function after stroke. Literature review. Ann Phys Rehabil Med 2009;52:69-93.

2. Cirstea, M.C, Levin MF. Improvement of arm movement patterns and end-point control depends on type of feedback during practice in stroke survivor. Neurorehabil Neural Repair 2007;21:398-411.
3. Mansur C. G., et al. A sham stimulation-controlled trial of rTMS of the unaffected hemisphere in stroke patients. Neurology 2008;64:1802-1804.

Application of robots in rehabilitation: successes and expectations

G. Fazekas^{1,2}, Z. Denes¹, E. Boros¹, M. Trocsanyi², K. Zsiga¹, O. Peter¹

¹National Institute for Medical Rehabilitation, Budapest, Hungary

²Szent Janos Hospital, Budapest, Hungary

Introduction. Rehabilitation robots are used for three purposes: assessment of status, supporting physiotherapy, aiding activities of daily living. The first two tasks can be executed by the same robot. The objective of this work is to overview the state of the art of rehabilitation robotics focused on application in neuro-rehabilitation. **Materials and methods.** Overview based on publications, conferences and web. **Results.** Most of the therapeutic robots are working only in laboratories, very few of them have been commercialized. Only some devices are able to work in three dimensions and make use of the whole range of motion of the human joints. Active or interactive therapeutic modalities are considered their main advantage. The aim of using robots in physiotherapy is not to replace the therapist, but to widen treatment options. The assistive robots have been planned mainly for domestic use. These equipments can provide emergency alarm, fall detection, motion assistance (mobility and grasping), cognitive support and stimulation, household duties, entertainment. Many of them are orientated to verbal robot-human communication, physical interaction requires more difficult solutions, but makes possible a wider range of services. Multi-functionality, integration of services would be reasonable for such devices. **Conclusion.** Application of robotic devices is still a pioneering field nowadays. Therapeutic robots seem to be useful in supplementation of traditional physiotherapy with interactive exercises. Assistive robots can improve the autonomy of people with disabilities and facilitate their social integration. Both groups can be especially useful for patients with multiple impairments and disabilities.

References

1. Fazekas G, Horvath M, Toth A. A Novel Robot Training System Designed to Supplementary Upper Limb Physiotherapy of Patients with Spastic Hemiparesis. Int J Rehabil Res, 2006;29(3):251-4.
2. Fazekas G, Horvath M, Troznai T, Toth A. Robot Mediated Upper Limb Physiotherapy for Patients with Spastic Hemiparesis - A Preliminary Study. J Rehabil Med, 2007;39(7):580-582.

Pressure exerted in the peroneal nerve pending on the different positions in the ICU bed

K. Grigoriadis¹, I. Efstathiou¹, I. Petrianos¹, A. Armaganidis², G.I. Vasileiadis¹

¹Department of Physical and Rehabilitation Medicine "Attikon" University, Hospital, Haidari, Greece

²Intensive Care Unit "Attikon" University Hospital, Haidari, Greece

Introduction. A big number of ICU patients present with peroneal paresis during their hospitalization. This is due to external pressure application from the bed's matrix against the peroneal nerve at the confined area that the nerve passes over the head of fibula. This pressure is augmented when the popliteal angle is bigger. We investigate the effect of different positions of the lower limb in the pathogenesis of this phenomenon. **Materials and methods.** A pressure manometer and an air-chamber were used in this study. The sample, n= 20 patients, was divided into two groups according to whether the knee joint overstepped the lower hinge of the bed (group A, n= 11), or not (group B, n= 9). All patients were placed in a recumbent position with the back of the bed stabilized while the lower extremities changed position as the angle of the lower hinge, changed from 0- till 35 -, at a rate of 5 -. **Results.** In all patients pressure readings changed during the different angulations of the knee joint. In group A, while the angle of the knee increased, the pressure readings fall. In group B, the knee angle increase was followed by a proportional increment in the pressure. Finally another observation was that in all cases that a heel pad for protection against pressure ulcers was used, there was a decrement in the pressure. **Conclusion.** The positioning of the patients' knees in a position slightly below the lower hinge of the bed is of crucial importance. Also the use of heel pads lowers the pressure exerted on fibula's head.

References

- Behse, F., Buchthal, F. Normal sensory conduction in the nerves of the leg in man. *Journal of Neurology, Neurosurgery, and Psychiatry*, 1971;34, 404-414.
- Brooks DM. Nerve compression by simple ganglia. *Journal of Bone and Joint Surgery*, 1952;34B, 391-400.
- Clawson DK, Seddon HJ. The late consequences of sciatic nerve injury. *Journal of Bone and Joint Surgery*, 1960;42B:213-225.
- Ferguson, FR, Liversedge, L.A. Ischaemic lateral popliteal nerve palsy. *British Medical Journal*, 1954;2, :333-335.

Body mass index and quality of life of patients before and after hip arthroplasty because of osteoarthritis

S. Dj. Jandric, R. Sukalo, Z. Jovicic, S. Popeskov, S. Grubiša
Institute for rehabilitation "Dr Miroslav Zotovic", Banja Luka, Republic of Srpska, Bosnia and Herzegovina

Introduction. As body weight, expressed as the Body Mass Index (BMI) rises, there are a number of diseases, such as osteoarthritis, associated with it. Obesity is particularly important in weight-bearing joints. The aim of the study was to investigate association between Body mass index (BMI) and various domains of quality of life of the patients with the end stage of osteoarthritis of the hip, before and after total hip arthroplasty (pain, stiffness and physical function). **Materials and methods.** This prospective clinical study included 105 women and men (average age 61.6±11.7 years, range 48 to 82 years) with diagnosis of severe hip osteoarthritis according to ACR criteria. All patients completed the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) questionnaires that measured health-related quality of life preoperatively and 6-wk postoperatively. Linear regression was used to determine association between BMI of the patients and various domains of quality of life (pain, stiffness, physical function before and 6-wk after total hip arthroplasty) controlled by age. WOMAC is transformed to a 0 –100 (worst to best) scale. **Results.** Average value of BMI was 30.7±5.1 kg/m². The pain score was 90.8±4.1 before arthroplasty and 6-wk postoperatively 99.8 ±0.6. Average value of physical function score was 72±12.6 preoperatively and 6-wk postoperatively 78.8. Results of the linear regression showed that dependent variable BMI was not statistically significantly associated with predictors (F=1.946, p>0.05). BMI was significantly associated with physical function before arthroplasty (t=2.91, p<0.01) only. **Conclusion.** BMI is important determinant of the clinical evaluation of patients with severe osteoarthritis of the hip. A higher BMI was associated with lower physical function before arthroplasty, in our study, but 6-wk postoperatively was not.

References

- Lübbke A, Duc S, Garavaglia G, Finckh A, Hoffmeyer P. BMI and severity of clinical and radiographic signs of hip osteoarthritis. *Obesity (Silver Spring)*. 2009;17:1414-9.

Randomized controlled trial of land based and water exercises program in patients with hip osteoarthritis

S. Patru, A.C. Bighea, I.R. Marcu, R. Popescu
University of Medicine and Pharmacy of Craiova, Romania

Introduction. Land based and water exercises improve pain levels, physical function, and self reported disability to patients with hip osteoarthritis (OA). Hydrotherapy is often recommended to these patients because water provides a range of benefits, including pain relief, and reduced loading on damaged arthritic joints. The main study hypotheses are that kinesitherapy or hydrotherapy can significantly decrease pain and physical limitations, improve health-related quality of life in patients with OA of the hip. **Materials and methods.** Subjects were randomized into one of the three groups: hydrotherapy (n = 10), kinesitherapy (n = 10) and control (n = 10). The two exercising groups had three exercise sessions a week for six weeks, and the control group had only pain medication. The outcome measures were: pain (on a numerical pain scale), disability (six minute walk test), SF-12 quality of life and time frame: baseline and 6 weeks. **Results.** At follow-up, the pain score significantly declined from baseline and the change in pain was not significantly different between groups. Hydrotherapy increased specially distance walked and kinesytherapy, walking speed, compared to control group. At the end of the study, the hydrotherapy group showed a significant improvement from baseline in the SF-12 physical component score and the kinesytherapy group in the SF-12 mental component score, but this change did not differ significantly between exer-

cises groups. **Conclusion.** Positive improvements in functional performance were achieved with both exercise programmes compared with the control group.

References

- Alexander MJL, Butcher JE, MacDonald PB. Effect of a water exercise programme on walking gait, flexibility, strength, self reported disability and other psycho-social measures of older individuals with arthritis. *Physio Canada* 2001;53:203–11.
- American Geriatrics Society. Exercise prescription for older adults with osteoarthritis pain: consensus practice recommendations. A supplement to the AGS Clinical Practice Guidelines on the management of chronic pain in older adults. *J Am Geriatr Soc* 2001;49:808–23.

Incidence of ulnar-to-median nerve motor fiber anastomosis (Riche-Cannieu anastomosis) in hand

T. Ahadi, G. Reza Raissi
Iran University of Medical Sciences, Firoozgar Hospital

Introduction. Two main muscles studied in hand for evaluation of median nerve injuries are opponens pollicis(OP) and abductor pollicis brevis(APB). However, Riche-Cannieu anastomosis (RCA) may limit the application of these muscles in electrodiagnosis; Moreover, study of ulnar to median anastomosis in previous studies has yield several flaws that may mistaken the precise incidence of this anastomosis. To evaluate this we conducted this study. **Materials and methods.** Twenty consecutive cases of complete median nerve injury were studied. Median nerve injury was determined by study of sensory and motor evoked responses as well as EMG findings in opponens pollicis (OP) and abductor pollicis brevis(APB). Evoked responses from wrist and picked up with needle was also evaluated by stimulation from median and ulnar nerves. **Results.** Eight five percent of the patients had RCA. In 5 cases there was no anastomosis to OP and the extent of innervations from ulnar nerve was much less than APB. **Conclusion.** This is the most accurate electrophysiologic study for RCA rate. OP is preferable to APB in study of median nerve. In all median nerve injury, evoked response must be studied to rule out RCA.

Shoulder instability in infantile spastic cerebral palsy (ISCP) treated with head humeral prosthesis: a case report

P. Bertocco, G. Giaffreda, S. Marzorati, D. Clementi
Medical Doctors, Azienda Ospedaliera G. Salvini, Garbagnate Milanese (Milano, Italy)
Ospedale di Circolo di Rho., O.U. Orthopaedic and Traumatologic Surgery, Rho (Milano, Italy)

Introduction. Patients with ISCP are affected by many related pathologies of the nervous system, with the result of a relevant musculoskeletal pattern of disability. The shoulder joint could be affected in different ways and degrees of pain and disability. Shoulder instability, reinforced by different morphologic and anatomic conditions, is one of the related complications of a ISCP, accompanied by pain. Our aim was to evaluate the effect of a head humeral prosthesis towards pain, instability and disability, in a patients affected by shoulder instability in ISCP. **Materials and methods.** Female, 30 yrs old VAS, FIM and SPADI were tested to evaluate pain, function and disability, at the times of T0, T3 (weeks), T6, T12, T16, T24 and T32. The rehabilitation strategy began at T3, with a passive set up at the beginning and an active one later (see results). **Results.** Table I.

	(T0	Û	T32).				
VAS	100	50*	30	30**	50	90*	40
SPADI	78	60*	62	63**	70	84*	64
FIM	52	51*	56	64**	56	41*	72

* FKT; ** No FKT

Conclusions. After surgery the pain decrease till the 3rd month. Between the 3rd and the 6th month, the pain increased (lack of compliance towards the rehabilitation program). Despite this clinical evidence, there was no evidence of abnormal X-ray reactions at the bone-prosthesis surface, without suspected intolerance findings, with a good relationship bone-to-prosthesis during the follow-up. After the 6th month (new rehabilitation program), the pain decreased a lot and a global/ site specific improvement of function was registered

(FIM/SPADI). Our findings could suggest that this technique in a good management of a patient affected by ISCP, is able to give a strong relationship with a defined rehabilitation set-up.

References

Lehmann L, Magosh P, Mauermann E et al. Total shoulder arthroplasty in dislocation arthropathy. *Int Orthop.* 2009;30
 Tonino PM, Gerber C, Itoi E, et al. Complex shoulder disorders: evaluation and treatment. *J Am Acad Orthop Surg.* 2009; 17: 125-36.
 Wemer A. Multidirectional shoulder instability. Nonoperative and operative treatment strategies. *Orthopade* 2009; 38: 64-9.

Tough discharges of patients affected by severe acquired brain

G.P. Salvi, A.M. Quarenghi, L. Manzoni, L. Smirni, C. Valiante, L. Valsecchi¹

1Centro di Riabilitazione Neuromotoria Clinica Quarenghi San Pellegrino Terme (Bg)

Discharges are one of the crucial phases during the rehabilitation process of patients affected by severe acquired brain lesion. Interviewing patients and their families we have collected data identifying critical areas laying discharges on the line. Areas of interest are: a) medical-sanitary aspects; b) family and caregiver's aspects; c) bureaucratic and welfare aspects; d) home suitability. The reference contest is Neurological Rehabilitation Unit of Quarenghi Clinic in San Pellegrino Terme. We have evaluated 100 difficult discharges starting from 2000 until 2009. **a) Medical-sanitary aspects.** Within the sample of 100 patients evaluated at the discharge stage, 32.2% of them were still affected by pulmonary/urinary or other compartments' infections. While 5% of them was affected by decubitus lesions. Furthermore 5% of them couldn't be discharged due to lack required medical devices. **b) Family and caregiver's aspects.** Within the sample of 100 patients evaluated at the discharge stage, 13.2% of them had a family unit affected by various problems, such as: old or ill parents, children affected by problems, family conflicts, low or absent incomes. In 21.6% cases the caregiver was absent or not suitable. This was the main critical area during the discharge phase. **c) Bureaucratic and welfare aspects.** Within the evaluated sample, we had identified that discharges were prevented in 8% of the patients due to bureaucratic difficulties, such as local health service (ASL) licences, required town council licences to modify architectural barriers, inability and accompaniment licences still not ready. **d) Home suitability.** Within the evaluated sample, patient's home was not suitable in 15% of the cases as the house was too small, not sufficiently heat, or not suitable due to inappropriate bathrooms or architectural barriers, such as stairs or narrow doors. **Conclusion.** Evaluating data we can conclude that discharges of patients affected by severe acquired brain lesion are difficult and gruelling. Difficult areas often mix together involving different professionals. The caregiver and the family play an essential role during the rehabilitation process and post-discharge phase. Territorial resources that can aid who can take care of the patient, are fundamental to ease discharges and shorten hospital stay's period. Sanitary economic programs should take into consideration the above mentioned problems and find them a solution.

Pre-operative pulmonary training program in coronary artery bypass graft surgery patients at Siriraj hospital

W. Thirapatarapong, N. Chumwong
Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand.

Introduction. To compare the incidence of pulmonary complications in coronary artery bypass graft surgery patients who underwent pre-operative pulmonary training program to those who did not. **Materials and methods.** The patients with coronary artery disease who underwent elective coronary artery bypass graft surgery at Siriraj Hospital from Jan to Dec 2007 were included in this study and were divided into two groups depending on whether they received pre-operative pulmonary training program. The primary clinical variable was the presence or absence of pulmonary complications. The comparison of pre-operative pulmonary training and non-pre-operative pulmonary training group was performed by Chi-square test for qualitative data and Independent sample t-test for quantitative data. **Results.** A total of 627 patients were divided into two groups, the pre-operative pulmonary training group (G1) and non-

operative pulmonary training group (G2). Comparison between two groups, pulmonary complications were significantly more frequent in G2 than in G1 (7.4% and 3.1%). The difference in incidence of pneumonia was also statistically significant (6.6% and 0.8% in G2 and G1), respectively. The odd ratio for total pneumonia of G2 was 9.3, 95% CI [2.1, 57.3] and for total pulmonary complication of G2 was 2.6, 95% CI [1.1, 6.3]. G2 also had longer length of stay than G1 (11.0 + 10.3 and 15.3 + 12.2 days), respectively. **Conclusion.** Pre-operative pulmonary training program can prevent post-operative pulmonary complications and reduce length of hospital stay in patients who underwent coronary artery bypass surgery.

References

Hulzebos EH, Helders PJ, et al. Preoperative intensive inspiratory muscle training to prevent postoperative pulmonary complications in high-risk patients undergoing CABG surgery. *JAMA.* 2006 Oct 18;296(15):1851-7.
 Arthur HM, Daniels C, et al. Effect of a preoperative intervention on preoperative and postoperative outcomes in low-risk patients awaiting elective coronary artery bypass graft surgery. *Ann Intern Med.* 2000 Aug 15;133(4):253-62.

Progression and explanatory factors of nutritional status in the few years post-stroke

J. Paquereau, M. Romon, E. Allard, W. Daveluy, M. Rousseaux
Service de rééducation neurologique, Hôpital Swynghedauw, CHRU de Lille, France

Introduction. Malnutrition is frequent in the first weeks or months post-stroke and is a main factor of poor short-term outcome. Here, we analysed the long-term evolution of nutritional status and its explanatory factors. **Materials and methods.** We included 50 patients at the outpatient rehabilitation clinic (M: 27; mean age=62.8) with a post-stroke delay of 1-5 years (mean=2.7). We examined: 1. The evolution of weight and BMI: before stroke (BS), at 3 weeks (W3), at discharge from inpatient rehabilitation (discharge) and at late examination (LE); 2. Possible explanatory factors: medical history (diabetes) general factors (age, gender, education), stroke severity (Rankin score, swallowing disorders at 3 weeks), sequelae (Rankin score, swallowing disorders, physical activities at LE), food intake preferences and actual socio-economic status. Malnutrition was defined according to the criteria of the French "Haute Autorité de Santé". **Results.** Weight decreased from BS to W3 (-3.6 +/-5.6 kg), remained stable until discharge (-0.2 +/-4.4 kg), then increased at LE (+3.2 +/-9.9 kg). At LE, 18 patients showed (>4%) weight loss in comparison with BS status, 19 showed increase (>4%), and 13 remain stable. Prevalence of malnutrition was 42%. Most important factors of weight and BMI evolution (LE-BS) were (p<0.01) preceding weight (-), sugar (+), salt (+) and fat (+) preferences, and diabetes (-). Malnutrition was associated with gender (male), preceding weight (-), Rankin score (+), presence of family (-) and institutionalization (+). **Conclusion.** Long-term nutritional status varies considerably after stroke, after discharge from inpatient rehabilitation unit. The prevalence of malnutrition is high. Follow-up and prevention are clearly insufficient, especially in institutions.

References

Gariballa SE, et al. Influence of nutritional status on clinical outcome after stroke *Am Clin Nutr* 1998; 68: 275-81.
 Finestone HM, et al. Malnutrition in stroke patients on the rehabilitation service and at follow-up: prevalence and predictors. *Arch Phys Med Rehabil*1995;76:310-306.

Pain – dysfunction ecuation to stroke survivors

A. Murgu, A. Nica, G. Mologhianu, C. Brailescu, B. Mitou, M. Ivascu
University of Medicine "Carol Davila", Bucharest, Department of Rehabilitation Medicine

Introduction. This study intends to analyze the clinical-functional dynamic of different groups of stroke survivors patients following a complex rehabilitation program. **Materials and methods.** We compared two similar (age, sex, diagnose, functional status) groups of patients of 75 patients each: one study group was treated with drugs and physical therapy for pains and dysfunction, the control group of 75 patients was treated only with drugs. The main problems we had to deal with were: shoulder subluxation 65% of patients, CRPS type I 20%, low back pain 25%, neuropathic pain 40%, peripheral joint pain 30%, osteoporosis 25%. To evaluate the patients we used different scores: Barthel Index, Womac Score, FIM scale, NIH stroke scale, DRS, Quallefo 41, VAS and Quick-DASH Score. We used low frequency, medium and high frequency electric currents, massage

and analytic kinetic therapy. **Results.** We obtained globally better results in the study group compared with the control group, pain improved with 67% compared with 56% in the control group, and functional improvement: 89% in the study group compared with 55% in the control group. **Conclusion.** Physical therapy in addition with drug therapy has evident benefits on stroke survivors quality of life more than drug therapy alone

References

1. Bonica JJ. History of pain concepts and therapies, in *The management of Pain*, 2002, p: 2-17;
2. Guck T. P&colab. Prediction of long term outcome of multidisciplinary pain treatment, in *Arch Phys Med Rehabil*, 2000, p: 293-296;
3. Strang JP. Chronic disability syndrome" in *Evaluation and Treatment of Chronic Pain*, 2003, p: 603-624;
4. DeLisa, A. Joel și Gans, M. Bruce, *Rehabilitation Medicine – Principles and Practice*. New York: Lippincott-Raven Publishers, 2003.
5. Popa, Constantin, *Accidental vascular cerebral ischemic. Profilaxie și tratament*. București: Asociația Națională de Stroke, 2001.

A bridge between a systemic approach and an ontogenetic approach for a-sailed- rehabilitation in seven situations of different tetraplegia

U. Incasa, P. Gabusi

In collaboration with -Centro di Riabilitazione Neuromotoria per Ragazzi Spastici Onlus, Bologna

Introduction. The characteristics of a rehabilitative approach, are presented by means of the re-examination of seven cases of tetraplegia reported in national and international rehabilitation conventions. Authors suggest a synergic therapeutic approach between systemic and hierarchized developmental models. At the admittance , there were seven patients: four types of tetraplegia caused by cerebral palsy (classification of A. Ferrari) two of them children, a dystonic tetraplegia, an acquired brain injury and one high, complete, spinal cord injury. **Materials and methods.** As to the treatment, the afferential synthesis has been considered (1.Anochin) a focal point between the two approaches. This afferential perceptive reorganizing approach based on ontogenetic developmental principle is supported by the concept of Disposition (2.Incasa). It has to be considered that Propensities are present in every Situation even of Biological nature (3. Popper) and they are a pre-requirement to Disposition. Moreover this approach is not centred on recalling reflexes which are independent of everybody's distinctive features. On considering that it is applied to a pathologic domain, we have to take into account the "pattern occlusion" phenomenon, described by Milani Comparetti, integrated in the pathologic expressiveness. The measures used were basically clinical-functional. Complexity in any single rehabilitation situation by the appearance of function categories was enlightened. **Results.** This review shows the quality of the outcome compared to natural history (Prognosis) in every presented case. **Conclusion.** Ontogenetic aspects are consistent with neuro-physiologic data (4.Berthoz, 5.Bach Y Rita). The emersion of primary emotions and Heteromodal Functions, their adjustment and constructive integration by Therapeutic Shared Action was considered. And so we hope that where Lions fly, Men can sail.

References

1. Anochin PZ. Neurofisiologia e cibernetica, *Atti del 18° Congresso Internazionale di Psicologia*, Mosca, 1966.
2. Incasa U, Gabusi P. Ipotesi pragmatica sull'ontogenesi emotiva dell'azione , seconda natura vs secondo natura. *Europa Medicophysica*, vol.44, suppl.1 al n°3, 2008.
3. Popper KR. A World of Propensities, Conference at The World Congress of Philosophy, Brighton, 1988.
4. Berthoz A. *Il senso del movimento*, McGraw Hill, Milano, 1998.
5. Bach Y Rita P. Recovery of Function: theoretical considerations for brain injury rehabilitation, Hans Huber – Bern, 1980.

Functional restoration in chronic low back pain tunisian experience

W. Herchi¹, W. Sarraj¹, A. Souayah¹, H. Rahali-Khachloul¹, I. Miri², S. Ghorbel², S. Lebib², F.Z. Ben Salah², C. Dziri²

¹*Department of Physical Medicine and Rehabilitation of the Military Hospital in Tunis*

²*Department of Physical Medicine and Rehabilitation of the Kassab Institute in Tunis*

Introduction. In developed countries, chronic low back

pain(LBP) is a frequent motive for consultation and it is one the most common reasons for disability and work-time loss.The ideas of functional restoration programs for patients with disabling chronic LBP were proposed in 1985. Its aims are to restore the physical, psychological, and social situations of patients through their active participation in treatment **Materials and methods.** Forward-looking Study concerning 30patients suffering from chronic(LBP) which are followed in our service of. All patients had an evaluation before and after the rehabilitation program: evaluation of pain by the VAS, Lumbar muscle stiffness can be assessed by the Schöber and Muscle strength can be assessed in the isometric or in the isocinetic condition.They had a psychological evaluation by the score of HAD and of the quality of life by the scale of DALLAS. **Results.** The average age of the population is 41years. The sex ratio is 2. The average BMI is 26,4kg/m². After the restoration functional program we reported decreased pain 80%. We note also for muscle strength stiffness decreases with an average schöber which passed from 3,7cm to 5,1cm.All parameters of strength and endurance are increased after the programs: Significant improvement of the flexor and extensor muscle strength in isometric condition, on the other hand there is no significant improvement of the extensor muscle in isocinetic condition. At the same time Depression and anxiety scores are improved. **Conclusion.** Despite evidence of the effectiveness of functional restoration programs, it has not been properly assessed, further research is necessary to assess clinical and cost effectiveness

References

1. Functional restoration programs for low back pain: a systematic review S. Poiraudeau, F. Rannou, *Annales de réadaptation et de médecine physique* 50.(2007)425-429.
2. Mayer.T, Tabor,J, Bovasso.E Gatchel.R.J. physical progress ans residual impairment quantification after functional restoration. PartI:lumbar mobility *Spine* 1994.19:389-394.

Management of knee osteoarthritis in physical and rehabilitation medicine in the elderly population

W. Herchi¹, Z. Saoud¹, A. Souayah¹, H. Rahali-Khachloul¹, I. Miri², S. Ghorbel², S. Lebib², F.Z. Ben Salah², C. Dziri²

¹*Department of Physical Medicine and Rehabilitation of the Military Hospital in Tunis*

²*Department of Physical Medicine and Rehabilitation of the Kassab Institute in Tunis*

Introduction. Knee osteoarthritis(OA) currently affects about 40% of people aged over 75 years, and its prevalence is predicted to rise significantly in the future as the population ages. People with kneeOA frequently report joint pain, increasing immobility and muscle weakness. Such signs and symptoms of the disease often culminate in reductions in quality of life. Current guidelines recommend non pharmacologic methods. **Materials and methods.** Retrospective case control study including 60 patients with kneeOA divided into 2 groups: subjects aged over 65 years and younger subjects (age between 30and 50years). All patients have Clinical evaluation of pain (VAS),clinical examination and functional evaluation (WOMAC, Lequesne index) before and after a two month rehabilitation program. **Results.** The average age of the older adults is 70 years old. The average age of the younger adults is 46 years. There is a female predominance in the 2 groups. The analyses of mobility of knee don't found differences into 2 groups. There is a weakness of the knee extensor and knee flexor, it is more pronounced among the elderly. The functional impact of knee osteoarthritis is important in the elderly. After physiotherapy we note the reduction 60% in the perception of pain and improvement of the mobility of knee in 5% in the both 2groups. There is also improvement of the quality of life echoing lequesne index and the walking distance more pronounced in the elderly population. **Conclusion.** Support rehabilitation of the knee is a necessary practice at all stages and allows especially the elderly to improve their functional capabilities and maintain their autonomy.

References

1. Marks R, Guassami M. R a Review of the Literature on Shortwave Diathermy as Applied to Osteo-arthritis of the Knee.*Physiotherapy* June 1999;85:6.
2. Ray Marks Dean Cantin Symptomatic Osteo arthritis of the Knee: The Efficacy of Physiotherapy.*Physiotherapy*,June1997;8;6.

Diagnostic Value of F-wave Latency in Alcoholic Polyneuropathy

H. Azadeh¹, E. Aul², J. Kimura²

¹School of Rehabilitation, Isfahan University of Medical Sciences, Isfahan, IRAN

²Department of Neurology, University of Iowa Health Care, Iowa City, IA 52242 USA

Introduction. Previous studies^{1,2} indicate that the length of the nerve segment under study dictates the accuracy and sensitivity of measurement. Although studies of shorter or longer segment pose technical merits and demerits, the choice seems to depend entirely on the pattern of the conduction abnormalities. Short distances magnify focal conduction abnormality despite increased measurement error, and long distances, although insensitive to focal lesions, provide better yields and reliability for a diffuse or multisegmental process. **Materials and methods.** To establish relative diagnostic sensitivities of various electrodiagnostic measures, we reviewed F waves and distal conduction studies (DCS) data in 30 patients with a clinical diagnosis of alcoholic polyneuropathy. **Results.** The conventional conduction abnormalities included median (31%), ulnar (25%), and tibial nerves (58%) for motor studies and median (47%), ulnar (29%) and sural nerves (30%) for sensory studies. F-wave prolongation, assessed against a height-latency nomogram³, comprised median (62.5%), ulnar (62.5%), peroneal (74%), and tibial nerves (83%). Analyzing all four nerves together, our data revealed delayed F-wave latencies in 26 (87%), and slow conventional studies in 24 (80%) patients. Of these, 22 showed abnormal F wave and DCS, 4 showed delayed F wave and normal DCS, 2 showed abnormal DCS and normal F-wave, and 2 showed normal F wave and DCS. European Society Of Physical And Rehabilitation Medicine. **Conclusion.** F-wave latencies serve the best for detecting mild conduction abnormalities of alcoholic polyneuropathy.

References

- Andersen H, Stalberg E, Falck B: F-wave latency, the most sensitive nerve conduction parameter in patients with diabetes mellitus. *Muscle Nerve* 20:1296-1302, 1997.
- Kimura J: Long and short of nerve conduction measures: reproducibility for sequential assessments. *J Neurol Neurosurg, Psychiatry* 71:427-430 2001.
- Nobrega JAM, Pinheiro DS, Manzano GM, Kimura, J: Various aspects of F-wave values in a healthy population. *Clin Neurophysiol* 115:2336-2342, 2004.

Work Related Low Back Pain Among Kosovo Power Plant Workers

????

?????

Background. Low back pain (LBP) has been identified as one of the most costly disorders among the worldwide working population. **Objective.** This study was designed to assess the incidence of low back pain among Kosovo power plant workers and to examine the correlation between age and the years in this occupation with severity of LBP and functional disability of the workers with LBP. **Materials and methods.** A cross sectional questionnaire survey was carried out among 489 workers from Kosovo Energetic Corporation. Four hundred and thirty production workers (Group I) and 59 office workers (Group II) were included in the study. The severity of LBP was evaluated with 10 mm visual analog scale(VAS). Oswestry low back pain disability questionnaire(OSW) was used to measure functional disability. **Results.** The prevalence of LBP was higher in Group II than in Group I (86.4%, 61.6%, respectively, p=0.000). The mean VAS score and ODI score was higher in Group I than in Group II (p<0,000 vs 0.016). The years in this occupation and VAS and OSW in both Groups were correlated (p<0.000), however there was no significant correlation determined between age and VAS and OSW scores of the office workers with LBP(p>0.05). **Conclusion.** The results of the study showed that low back pain occurred in 86.4% of workers. This study identified that years of employment in current job can contribute in induction or intensification of LBP.

References

- Sarikaya S, et al.. Low back pain and lumbar angles in Turkish coal miners. *American Journal of Industrial Medicine*, 2007, 50, 92-96
- Holmberg S,et al. Low back pain comorbidity among male farmers and rural referents. *Ann Agric Environ Med. Sweden*, 2005, 12, 261-268.

Case Report: Amyotrophic Lateral Sclerosis Patient Presenting With Radiculopathy and Polyneuropathy

K. Alptekin, V. Ozden, D. Diracoglu

Istanbul University, Medical Faculty, Physical Medicine and Rehabilitation Department

Introduction. Amyotrophic Lateral Sclerosis (ALS) is a disease of unknown etiology, characterized with degeneration of upper and lower motor neurons. It's easily mixed with MS and other disorders with demyelination, cervical myelopathy, radiculopathies and polyneuropathies. **Materials and methods.** Our patient was 61 years old and her complaints were back pain and walking difficulty. She was able to walk with a walker since 3 years. Valsalva sign was negative, morning stiffness did not exceed 30 minutes. Her pain subsides with heat application and analgesic medications. On physical examination lumbar range of motion was limited in all aspects and painful especially at flexion. Bilateral straight leg raising test was 80°; Mennel and Gaenslen tests were negative. On neurologic examination muscle strength at upper extremity was 4/5 globally. Muscle strenght around left hip was 4+/5, right hip 4-/5, knee bilateral 4+/5, dorsiflexor and plantarflexor of left ankle was 4-/5, at right was 5/5, EHL at left was 3/5 and at right 4/5. Light touch was normal bilaterally, deep tendon reflexes were hypoactive at upper and lower extremities. At MRI of lumbar vertebra Grade I spondylolistesis at L4-L5 and bilateral foraminal stenosis at the same level was found out. As her MRI results and physical examination were inconsistent needle EMG was performed. All CMAPs at upper and extremity were recorded as low, by needle EMG intense spontaneous pathologic activity, long dispersed MUAPs with high amplitude and complex repetitive discharges at all upper,lower, tongue and rectus abdominalis muscles were noted. These findings were consistent with diffuse spinal anterior horn cell involvement. **Conclusion.** To conclude, the patient was diagnosed as motor neuron disease (ALS) by Neuromuscular Diseases Department of Neurology, Riluzole 50 mg twice a day. Patient and her relatives were taught her exercise regimen and was discharged from our clinic with further suggestions.

Acoustic voice analysis in patients with subcortical aphasia

M. Vukovic, M. Petrovic-Lazic

University of Belgrade-Faculty of Special Education and Rehabilitation, Belgrade, Serbia

Introduction. With left-sided lesion to the thalamus, basal ganglia, and internal capsule, a heterogeneous collection of language disorders may occur, among which aphasia is very common. Hypophonia and dysarthria very often accompany subcortical forms of aphasia. The aim of this paper was to analyze acoustic characteristics of voice in patients with aphasia due to lesions in a subcortical structure. **Materials and methods.** The acoustic tests were administered on fifteen male patients with subcortical aphasias and fifteen healthy male subjects. Each subject was asked to perform maximal vowel 'a' phonation. The acoustic parameters were Fo, Jitter, Shimmer, the Amplitude tremor frequency (Fatr) and Noise to harmonic ratio (NHR). The computerized voice analysis laboratory „Kay Elemetrics“ (Multi-dimensional Voice Program) was used. **Results.** The results showed increase values of Fo (mean: 170,28Hz), Jitter (mean: 8.450%), Shimmer (mean: 1.589dB), Fatr (mean: 7.580Hz) and NHR (mean: 1.248) compared with the voice parameters in the control group of subjects. **Conclusion.** It is pointed out that acoustic analysis of voice could have a significant role in evaluation of speech production deficits in patients with subcortical aphasia.

Key words: acoustic characteristics of voice, lesion of the subcortical structure, subcortical aphasia.

References

- Bradshaw, JL & Mattingley, JB (1995). *Clinical Neuroopsychology*. Behavioural and Brain Science. San Diego, Academic Press, INC.
- Radanovic, M. Mansur LL. Azambuja, MJ (2004). Contribution to the evaluation of language disturbances in subcortical lesions: a pilot study. *Arq Neuro-Psiquiatr*, 62, 51-7.
- Tomić G, Stojanović M, Pavlović A, Stanković P, Zidverc-Trajković J, Pavlović D, Marković-Jovanović Z., Čovičković-Šternić N. (2009). Speech and language disorders secondary to diffuse subcortical vascular lesions: Neurolinguistic and acoustic analysis. A case report. *Journal of the neurological sciences*, 283, 163-169.

The effectiveness of Mirror Therapy for preventive and therapeutic Phantom Limb Pain treatment: a case control study on 4 amputees patients.

C. Laurentaci¹, G. Guida¹, V. Pietragalla¹, M.R. Lisanti¹, L. Dicandia¹, M. Ranieri², G. Megna²

¹*U.O. Medicina Fisica e Riabilitazione, Ospedale Madonna delle Grazie, Matera*

²*Cattedra di Medicina Fisica e Riabilitazione, Università degli Studi di Bari*

Introduction. Phantom Limbs are a frequent phenomena among amputees: about 90-98% of subjects are affected¹; particularly Phantom Limb Pain (PLP) is present in 60 - 80% of them². Many strategies of treatment have been used during years, without reaching satisfying results. Mirror Therapy seems to be the fittest strategy to contrast PLP³: it's a behavioral strategy able to contrast cortical maladaptive neuroplasticity of body schema through synchronous visuo-motor stimulation instead of lost sensory-motor stimuli. **Materials and methods.** Our study has the aim to verify the effectiveness of the therapy both as preventive or as therapeutic chronic pain treatment. Four amputees have been involved in our study. 30 minutes daily treatment have been performed during four weeks. Outcome measurement have been performed by VAS – 100mm, McGill Pain Questionnaire and a Pain Diary, useful to calculate frequency of pain attacks onset. **Results.** The case enrolled as control, during all the observation period, demonstrated only few improvements both in intensity and frequency of pain (-5% at VAS – 100mm). Chronic Pain in the two patients with stabilized situation improved both in intensity and frequency of pain (Intensity: -62% and -100%; frequency: -90% and -100%). No pain revealed in the patient treated preventively, contrarilywise he kept unchanged his body schema revealing a functional Inferior Phantom Limb. **Conclusion.** Mirror Therapy seems to be most effective strategy to manage PLP, contrasting cortical maladaptive neuroplasticity^{4,5}. Moreover, the therapy performed preventively could accelerate the global rehabilitation process and the prosthesis adopting process (myoelectrical or biomechatronic ones).

References

1. Ramachandran VS, Hirstein W. The perception of phantom limbs: the D.O. Hebb lecture. *Brain* 1998;121:1603-1630.
2. Kooijman CM, Dijkstra PU, Geertzen JHB, Elzinga A, van der Schans CP. Phantom pain and phantom sensations in upper limb amputees: an epidemiological study. *Pain* 2000;87:33-41.
3. Chan BL, Witt R, Charrow AP. Mirror therapy for phantom limb pain. *N Engl J Med.* 2007 Nov 22;357(21):2206-7.
4. Nikolajsen L, Jensen TS. Phantom limb pain. *Br J Anaesth.*2001;87:107-116
5. Flor H. Phantom limb pain: characteristics, causes, and treatment. *Lancet Neurol.* 2002;1:182-189.

Home based computer assisted upper limb exercise for young children with cerebral palsy: A feasibility study investigating impact on motor control and functional outcome

B.B. Bhakta, A. Weightman, N. Preston, R. Holt, M. Mon Williams, M. Clarke, J.A. Cozens, M.C. Levesley

University of Leeds

Introduction. Difficulties with arm movement are common in children with cerebral palsy. Intensive practice can be beneficial [1] We have developed a computer home-based rehabilitation exercise system(HB-RES) incorporating a force-feedback joystick linked to computer game. HB-RES assists children with arm paresis to participate in independent fun home exercises through an engaging exercise environment and physical guidance. We investigate the feasibility and impact of using the (HB-RES) in the home setting. **Materials and methods.** 18 children with CP (median age 7.5 years, range 5-16) were recruited from local hospitals and a HB-RES installed in their home for approximately 4 weeks. Baseline/post intervention assessments: Canadian Occupational Performance Measure(COPM); kinematic measurement of arm movement time(MT) and smoothness(NARJ) during standardised tasks(Optotrack Certus). Reduction in MT and NARJ indicate improvement in quality of voluntary movement. Data was analysed using the Wilcoxon Signed-rank test. COREC number 06/Q1205/84. **Results.** HB-RES usage: median, 75 minutes (IQR 17-271); equating to 606 reach/734 retrieve exercises. One child did not attend follow-up visit. Two children used HB-RES for less than 30 minutes during the four week period. Pre-COPM (median 4.2); post-COPM (median 6.0); obs=34; z=3.62, p<0.05, r=0.62). Pre-MT (median 3.1 seconds); post-MT (median 2.1 seconds); obs=64, z=-4.03, p<0.05, r=0.50). Pre-NARJ (median 36125

Units); post-NARJ (median 11391 units); obs=64; z=-4.49, p<0.05, r=0.56). **Conclusion.** Some improvements in self-report function and quality of movement are observed. This pilot study suggests that HB-RES could be used to augment home based arm exercise in an engaging way for children with Cerebral Palsy. The lack of a control group limits the conclusions that can be drawn in terms of impact on function. Further controlled clinical studies are planned.

References

1. Taub E et al. Efficacy of constraint induced movement therapy for children with cerebral palsy with asymmetric motor impairment. *Pediatrics* 2004; 113:305-312.

Feasibility of using a dual rehabilitation robotic system (iPAM) to improve quality of voluntary upper limb movement in people with stroke: a pilot evaluation of upper limb reaching kinematics.

B.B. Bhakta, A.J. Jackson, P. Culmer, S. Makower, J. Savage, M. Mon Williams, M.C. Levesley, J.A. Cozens

University of Leeds

Introduction. The iPAM robotic system [1] enables stroke patients to undertake voluntary arm exercises, prescribed by the physiotherapist. We investigated the feasibility of delivering iPAM exercises in a broad range of people with stroke, and measured its effect on voluntary arm movement. **Materials and methods.** 15 people with moderate to severe stroke were recruited (age: median 62 years; range 41–81 years); time post-stroke: median 3 years, range 0.4-12 years); Male:Female, 3:1; right hemiparesis (n=9); Fugl-Meyer(FM) median 12(IQR 9-16). A physiotherapist prescribed individualised robot assisted exercises for each patient. Participants were offered 20 iPAM assisted exercise sessions in a laboratory setting over 5-7 weeks program. Pre and post program kinematic measurement of voluntary reaching movements for each participant were measured in a standardised task(Optotrack Certus). Movement distance(MD), movement time(MT) and Normalised Average Jerk (NARJ) analysed using Wilcoxon Signed-Rank test. COREC number 04/031. **Results.** 406-718 arm exercises were completed per participant. No clinical adverse events occurred in the total of 7579 exercises. 79 rectifiable technical issues arose, none were hazardous to patients. Pre-MD (median 155mm); post-MD (median 252mm); n=15, z=-2.67, p<0.05, r=0.48. Pre-MT (median 2.0 seconds); post-MT (median 1.6 seconds); n=10, z=-1.89, p=0.06, r=-0.42. Pre-NAJ (median 977 units); post-NAJ (median 749 units); n=10, z=-1.17, p=0.24, r=-0.26. No significant change in Fugl-Meyer were identified. **Conclusion.** This pilot study demonstrates that iPAM can safely deliver physiotherapist prescribed exercises at reasonable intensity in those with severe arm paresis. Range in voluntary movement improved. Changes in MT and Jerk did not reach statistical significance but effect size(r) indicated potential for effect. Lack of control group limits conclusion.

References

1. Dual Robot System for Upper Limb Rehabilitation after Stroke: The Design Process. Jackson AE, Holt RJ, Culmer PR, Makower SG, Levesley MC, Richardson RC, Cozens JA, Mon-Williams M, Bhakta BB, *Journal of Mechanical Engineering Science.* 2007;221(7):845-857.

Saphenous nerve entrapment at the pes anserine bursa: A possible etiology for persistent symptoms in patients with knee osteoarthritis

Hussein A. Sultan, Gihan A. El-tantawi

Physical Medicine, Rheumatology, and Rehabilitation Department, Alexandria University, Alexandria, Egypt.

Introduction. Osteoarthritis (OA) of the knee is frequently associated with pes anserine bursitis.⁽¹⁾ These cases may show refractory response to treatment.⁽²⁾ Entrapment of the saphenous nerve by pes anserine bursitis⁽³⁾ may be a causative factor. The association between pes anserine bursitis and saphenous neuritis in patients with knee OA was not previously determined and entrapment of the nerve in those patients may be an overlooked condition. **Materials and methods.** Forty-five patients (38 women, 7 men; mean age 56.1±5.3 years) with unilateral symptomatic knee OA were evaluated. Ultrasonographic examination was performed for all patients. Electrophysiological techniques for assessment of the saphenous nerve included sensory nerve-conduction study and somatosensory evoked potentials (SEPs) at both sides. SEPs were performed by stimulating the nerve proximal and distal to the pes anserine bursa.

Thirty healthy controls were enrolled. **Results.** All patients fulfilled the ACR classification criteria for knee OA. Clinical and ultrasonographic features of pes anserine bursitis were detected in 28 patients (62.2%). Clinically suspected saphenous nerve entrapment was detected in 12 patients (26.7%). Sensory nerve-conduction study revealed slowing of conduction velocity in 15 patients (33.3%). Reduced sensory nerve action potential amplitude was found in 9 patients (20%). SEP abnormalities (delayed latency to stimulation distal to pes anserine bursa and/or increased interside latency difference) were detected in 16 patients (35.6%). Normal SEP latency stimulating above the pes anserine bursa localizes the lesion to the level of the bursa. **Conclusion.** Saphenous nerve entrapment secondary to pes anserine bursitis is rather common and can be an etiological factor for persistent symptoms in patients with knee OA. Electrophysiological techniques can localize the entrapment site and prove the diagnosis.

References

1. Handy JR. Anserine Bursitis: A Brief Review. Southern Medical Journal 1997;90(4):376-7.
2. Larsson LG, Baum J. The syndrome of anserina bursitis: an overlooked diagnosis. Arthritis Rheum 1985;28(9):1062-5.
3. Hemler DE, et al. Saphenous nerve entrapment caused by pes anserine bursitis mimicking stress fracture of the tibia. Arch Phys Med Rehabil 1991;72(5):336-7.

Is low level laser therapy effective in acute or chronic low back pain?

S. Ay, S. Koldas Dogan, D. Evcik

Department of Physical and Rehabilitation Medicine, Ufuk University School of Medicine, Ankara, Turkey

Introduction. Low Level Laser therapy (LLLT) has been used to treat acute and chronic pain of musculoskeletal system disorders¹. The purpose of this study was to compare the effectiveness of LLLT on pain and functional capacity in patients with acute and chronic low back pain caused by lumbar disc herniation (LDH). **Materials and methods.** This study is a randomized, double blind, placebo-controlled study. Forty patients with acute and 40 patients with chronic low back pain caused by LDH were included. Group 1 (acute LDH, n=20) received hot-pack+laser therapy; group 2 (chronic LDH, n=20) received hot-pack+ laser therapy; group 3 (acute LDH, n=20) received hot-pack+placebo laser therapy and, group 4 (chronic LDH, n=20) received hot-pack+placebo laser therapy, for 15 sessions. Patients were treated for a 850nm gallium-aluminum-arsenide laser. Assessment parameters included pain, patients's global assessment, physician's global assessment and functional capacity. Pain was evaluated by visual analogue scale (VAS) and likert scale. Patient's and physician's global assessment were also measured with VAS. Modified Schober test, flexion and lateral flexion measures were used in the evaluation of range of motion (ROM) of lumbar spine. Roland Disability Questionnaire (RDQ) and Modified Oswestry Disability Questionnaire (MODQ) were used in the functional evaluation. Measurements were done before and after 3 weeks of treatment. **Results.** After treatment there were statistically significant improvements in pain severity, patient's and physician's global assessment, ROM, RDQ scores and MODQ scores in all groups (p<0.05). However no significant differences were detected between the four treatment groups with respect to all outcome parameters (p>0.05). **Conclusion.** There were no differences between laser and placebo laser treatments on pain severity and functional capacity in patients with acute and chronic low back pain caused by LDH.

References

1. Gur A, Karakoc M, et al. Efficacy of laser therapy and exercise on pain in chronic low back pain. Lasers Surg Med 2003; 32: 233-238

Efficacy of different therapy regimens of low level laser in low back pain

S. Ay, S. Koldas Dogan, D. Evcik

Department of Physical and Medicine Rehabilitation, Ufuk University School of Medicine, Ankara, Turkey

Introduction. Low Level Laser therapy has been used to treat chronic pain of musculoskeletal system disorders¹. The purpose of this study was to compare the effectiveness of two different laser therapy regimens on pain and functional capacity in patients with chronic low back pain. **Materials and methods.** This study is a randomized, double blind, placebo-controlled study. Group 1 (n=20) received hot-pack+laser therapy 1 (wavelength of 850nm gallium-aluminum-

arsenide laser, 4 min at each point, producing energy of approximately 40J/cm²); group 2 (n=20) received hot-pack+ laser therapy 2 (wavelength of 650nm Helyum-Neon, 785 ve 980nm Gal-Al-As combined plaque laser, 20 min on paravertebral muscle, energy of approximately 10J/cm²) for 15 sessions during in 3 weeks. Assessment parameters included pain, patients's global assessment, physician's global assessment and functional capacity. Pain was evaluated by visual analogue scale (VAS). Patient's and physician's global assessment were also measured with VAS. Modified Schober test, flexion and lateral flexion measures were used in the evaluation of range of motion (ROM) of lumbar spine. Roland Disability Questionnaire (RDQ) and Modified Oswestry Disability Questionnaire (MODQ) were used in the functional evaluation. Measurements were done before and after 3 weeks of treatment. **Results.** After treatment there were statistically significant improvements in pain severity, patient's and physician's global assessment, ROM, RDQ scores and MODQ scores in all groups (p<0.05). However statistically significant differences were detected between groups with ROM, RDQ and MODQ scores (p<0.05), but no significant differences were detected between groups pain severity. **Conclusion.** Different kind of laser applications may provide improvements in ROM and functional capacity of the patients with chronic low back pain, however no superiority on pain severity was detected.

References

1. Gur A, Gosut A, et al. Efficacy of different therapy regimens of low-power laser in painful osteoarthritis of the knee. Laser Surg Med 2003; 33: 330-8.

The effectiveness of portable audio biofeedback device in myofascial pain syndrome

S. Ay, S. Koldas Dogan, D. Evcik

Department of Physical and Rehabilitation Medicine, Ufuk University School of Medicine, Ankara, Turkey

Introduction. The treatment of myofascial pain syndrome (MPS) is focused on decreasing the pain, ensuring sufficient muscle strength and appropriate posture¹. The aim of this study was to investigate the effectiveness of portable audio biofeedback device in the treatment of MPS. **Materials and methods.** Thirty five patients (29 females/6 males) diagnosed with MPS were included in the study. In Group 1 (n=20); patients used portable audio biofeedback device placed in the middle of both scapula 5 times a week for 1 month. Additionally, patients received home exercises including posture exercises. In Group 2 (n=15); patients received only home exercises. Before and 1 month after treatment, pain (Visual analogue scale; VAS-10cm), number of trigger points, pressure pain threshold, cervical range of motion (ROM), shoulder and head angle evaluations were done. The disability was evaluated with Neck Pain Disability Index (NPDI). **Results.** In Group 1, statistically significant improvements were observed in VAS, number of trigger points, pressure pain threshold, shoulder and head angles and NPDI scores (p<0.05) We could not find any differences in cervical ROM (p>0.05) after the treatment. In Group 2, all parameters showed statistically significant improvements (p<0.05) except pressure pain threshold and cervical ROM (p>0.05) after treatment. There were statistically significant differences between the groups in VAS, number of trigger points, shoulder and head angles, NPDI scores (p<0.05); while no significant differences were detected in pressure pain threshold, cervical ROM (p>0.05) after the treatment. **Conclusion.** Portable audio biofeedback device seem to have positive effects on pain, disability and posture. It is a simple, cheap and easy use device that teaches patients correct posture and can be used in combination with other treatment approaches.

References

1. Giansanti D, Dozza M et al. Energetic assessment of trunk postural modifications induced by a wearable audio-biofeedback system. Med Eng Phys 2009; 31:48-54.

The significance of balneophysical treatment in children operated on for legg-calve-perthes' disease (LCPD)

J. Milovanović-Arsić, N. Sremčević, N. Jevtić, D. Gogić

The Specialized Rehabilitation Hospital, Banja Koviljaca, Serbia

Introduction. To investigate the significance of balneophysical treatment on functional and radiographic recovery of children operated on for LCPD¹, and to compare the results depending on the fact if children were administered mud therapy with kinesio therapy or they had the interferential current therapy (IFC) adjoined to it.

Materials and methods. Prospective study involved 40 children, age 3-11, who underwent combined femoral and Salter's osteotomy surgery², and rehabilitated in the Specialized Rehabilitation Hospital, Banja Koviljaca, between 2001 and 2005. First group of subjects was administered mud, kinesio and hydrotherapy, and the second had IFC treatment adjoined to the former. We recorded the presence of the pain, estimated quality of gait, measured hip motion range, circumference and length of the limbs at the beginning, in the end and three years after rehabilitation. We also measured first and final Centre edge (CE) angle, estimated the level of primary damage and the final result according to Catterall and Mose in order to observe functional and radiography recovery. Wilcoxon and T tests were used. **Results.** After rehabilitation we recorded statistically significant pain reduction in groups, motion range and limbs circumference increase, CE angle increase and improvement of Mose's results ($p < 0.01$). There was no statistically significant difference between groups in any part of observation. 85% of patients walked correctly after three years of observation. In 88% of hips, good and satisfying result according to Catterall was recorded. **Conclusion.** Immediate balneophysical treatment in most of subjected children contributed to the good final functional and anatomic result. The use of electrotherapy did not have any influence on the outcome.

References

1. Wenger DR, Ward WT, Herring JA, LCPD. J Bone Joint Surg 1991;73A:778-788.
2. Barlov S. Efekat istovremene inominatne osteotomije i osteotomije femura na tok i prognozu LCPB. Magistarska teza Medicinski fakultet, Beograd, 2005.

The effect of horizontal® therapy on functional recovery of patients with lumbar discus hernia

S. Marković¹, J. Milovanović-Arsić¹, A. Jokić¹, N. Sremčević¹, K. Hansjürgen²

¹The Specialized Rehabilitation Hospital, Banja Koviljaca, Serbia
²Hako-Med Research Dep. USA, Honolulu, Hawaii

Introduction. Horizontal® therapy (HT) is a form of electrotherapy, implying the use of alternating current of middle frequency (4400-12 300 Hz).¹The aim of this study was to investigate the effects of HT® on alleviating pain and the functional recovery of patients with lumbar discus hernia, and to compare the results with the results of combined use of two traditional electrotherapies. **Materials and methods.** Prospective study involved sixty subjects with verified lumbar discus hernia. Subjects in the first group were treated with HT. The second group had a combination of diadinamic currents and electrophoresis. Pain intensity was measured with VAS on the 1st, 2nd, 4th, 8th and 10th day. In order to observe the functional recovery, the tonus of paravertebral muscles was evaluated, modified Schober test and straight leg test were measured, prior to and after the treatment. The quality of life was estimated with Oswestry score.² Wilcoxon and T tests were used. **Results.** There was significant pain reduction ($P < 0.01^{**}$) in both groups after the treatment. Analgesic effect was more pronounced in the first group ($p < 0.01^{**}$). Without any differences between two groups, the tonus of paravertebral muscles was significantly reduced, and modified Schober and straight leg test were increased. The quality of life was significantly improved in the groups, and there is better effect of HT in some parts (taking analgesic drugs, lifting the load, standing). **Conclusion.** Horizontal® therapy is efficient in improving the functional status and quality of life of the patients. Analgesic effect of the HT was pronounced in comparison to the combined use of diadinamic currents and electrophoresis.

References

1. Zambito A. et al. Clinical assesment of new from of elektro analgesis: The Horizontal® therapy. Eur Med Phys, 2003; 3: 729-732
2. Fairbank J.C. et al. The Oswestry Low Back Pain Disability Questionnaire. Psychotherapy 1980; 66 271-273.

The effect of balneophysical treatment on functional recovery of patients with implanted hip endoprothesis of diverse etiologies

S. Radulović, S. Marković, N. Sremčević A. Jokić
 The Specialized Rehabilitation Hospital, Banja Koviljaca, Serbia

Introduction. To investigate the effects of balneophysical treatment on functional recovery and ability improvement in daily life activities (DLA) in patients after implantation of hip endoprothesis¹ and to compare the results depending on the fact if surgery was

performed due to advanced arthrosis or hip fracture. **Materials and methods.** The prospective study, from December, 2008 to March, 2009, in the Specialized Rehabilitation Hospital, Banja Koviljaca, involved 60 patients with the implanted hip endoprothesis. The subjects, both genders, were assigned into two groups depending on the fact if surgery was performed due to arthrosis or hip fracture. The rehabilitation lasted 28 days and included: kinesiotherapy, electrotherapy, magnetotherapy and hydrokinesiotherapy in the sulphuric thermomineral water pool. In order to make clinical and functional evaluation prior to and after the treatment we used: visual analogue pain scale, flexion, abduction and extension measurements in operated hip and estimation of DLA according to Lequesne index.² Wilcoxon and T tests were used. **Results.** After the rehabilitation, we recorded statistically significant pain reduction during motion in operated joint, increase in flexion, abduction, extension, and significant improvement in abilities for DLA, verified through decrease of total score and the score of single segments of Lequesne index ($p < 0.01$). By parallel statistical analysis, we established that pain reduction, flexion improvement in operated hip and improvement of the first part of Lequesne index was more pronounced in subjects who underwent surgery because of hip injury. **Conclusion.** Timely and continuous balneophysical treatment after hip endoprothesis implantation leads to faster mobilization, pain reduction, functional status and quality of life improvement. Slightly better effects were achieved in patients who underwent surgery due to hip injury.

References

1. Mc Carty MD Getting „Hip“ Joint Replacement surgery. AAOS. 2007.
2. Lequesne MG. The algofunctional indices for hip and knee osteoarthritis. J Rheumatol. 1997;24:779-781.

Locked-in syndrome: a project for independent living after returning home

A. Giovagnoli¹, G. Lo Vullo², C. Stea³, E. Fragiaco⁴, G. Cattunar⁵

¹Managing physiatrist, Rehabilitation Division, Public Health District N° 4, Public Health Establishment N° 1
²Managing psychologist, Unit for the Protection of Children and Adolescents, Public Health District N° 4, Public Health Establishment N° 1
³Psychologist-Psychotherapist, Rehabilitation Division, Public Health District N° 4, Public Health Establishment N° 1
⁴Director of Public Health District N° 4, Public Health Establishment N° 1
⁵Physiotherapist, Rehabilitation Division, Public Health District N° 4, Public Health Establishment N° 1

Introduction. The authors describe a rehabilitation program adopted for a patient with locked-in syndrome, that has lasted 10 years so far and is still underway, the ultimate aim of which was to enable the patient to live at home by means of an independent living project. The focus is on the strengths of the program and the critical issues that emerged from this experience. **Materials and methods.** The assessment scales used were the Disability Rating Scale, the Level of Cognitive Functioning Scale, and formal tests (e.g. the Raven matrices P47). A critical review was also conducted on the patient's clinical records and rehabilitation treatments, and of interviews with the patient and members of the family. **Results.** An early diagnosis of the patient's state of awareness, the development of a new manner of operating and taking into care, and a therapeutic alliance with the patient and family enabled the patient to return home after radically modifying his attitude to life, thereby improving his quality of life. This also meant a major cost saving for the public health system. **Conclusion.** Even in conditions of very severe disability, the presence of a well-developed territorial public health network for providing care and support, the adoption of a tailored project, the availability of highly-expert and strongly-motivated professionals, and the constant presence of a family willing to co-operate in the various stages of the process can enable patients with locked-in syndrome to live at home and exercise their self-determination.

References

- Borgnolo G, De Camillis R, Francescutti C, Frattura L, Troiano R, Bassi G, Tubaro E. (a cura di): ICF e Convenzione ONU sui diritti delle persone con disabilità. Nuove prospettive per l'inclusione. Guide per l'educazione speciale. Erickson Editore, 2009.
- De Tanti A, Saviola D. Riabilitazione della persona con esiti di trauma cranioencefalico e di grave cerebrolesione acquisita. EMC (Elsevier Masson SAS, Paris), Medicina Riabilitativa, 26-455-d-15, 2008.
- Smith E, Delargy M. Locked-in Syndrome. British Medical Journal, 330:406-9. 2005.

A Preliminary Assessment of the Benefits of the Addition of Botulinum Toxin A Free of Complexing Proteins (XEOMIN®) to a Conventional Therapy Program on the Function of People With Longstanding Stroke

V. Rossi¹, M. Casaleggio², S. Baietta², C. Bet², A. Crovetto², S. Pistoni¹, D. Dall'Agata¹

¹Department of Primary Care ASL3, Genoa

²Department of Rehabilitation ASL3, Genoa

Introduction. To determine if botulinum toxin type A free of complexing proteins (XEOMIN®) combined with therapy can facilitate improved upper-extremity (UE) functional status. **Materials and methods.** Design: non controlled trial. Participants: Convenience sample of 6 men and women (ages 36-77y) with stroke more than 2 years after insult (range 2-6 y) who had tone greater than 3 on the Ashworth Scale for 2 joints in the involved UE. **Materials and methods.** Subjects were consecutively recruited and treated in a non controlled trial. Subjects received XEOMIN® combined with a defined therapy program in three week sessions. **Main Outcome Measures.** The primary functional outcome measure was Disability Assessment Scale (DAS). Subjects were also assessed on physiologic measures including tone (Modified Ashworth Scale), range of motion, disability (Barthel Index) and pain (VAS). **Results.** All patients had at least moderate severe disability in their principal therapeutic target on the DAS. Four weeks after treatment, the XEOMIN® combined with therapy decreased the Ashworth score statistically ($P=0.0018$) and improved the functional status of the subjects on the DAS ($P=0.0203$). In all patients did not occurred adverse events (AE). **Conclusion.** XEOMIN® combined with a focused traditional therapy program, reduced disability and muscle tone, enhanced the functional status and was well tolerated in patients with post-longstanding stroke spasticity of the upper limb. In this carefully selected population, this combined treatment appears to somewhat enhance Activities of Daily Living in stroke subjects even after the paralytic effects had largely worn off.

References

- Kanovský P et al. Efficacy and safety of botulinum neurotoxin NT 201 in post-stroke upper limb spasticity. *Clin Neuropharmacol.* 2009 Sep-Oct;32(5):259-65.
- Simpson DM et al. Assessment: Botulinum neurotoxin for the treatment of spasticity (an evidence-based review): Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology* 2008;70:1691-1698.

Physiotherapeutic protocol for the fractures of distal radius treated with internal or external fixation

K. Kateros¹, V.I. Sakellariou², H. Tsididakis², A. Farmakidis³, G. Mazis², I. Sofianos⁴

¹Orthopaedic Department, General Government Hospital of Athens

²1st Orthopaedic Department, University of Athens, ATTIKON University General Hospital, Greece

³Physical Medicine and Rehabilitation of Asklipio Voulas Athens, Greece

⁴Orthopaedic Department, General Hospital of Livadeia, Greece

Introduction. To compare indirect reduction and external fixation with open reduction and internal fixation for displaced intra-articular fractures of the distal radius combined with specific physiotherapeutic protocol. **Materials and methods.** 113 intra-articular fractures of the distal radius were managed operatively; 49 fractures were treated with external fixator and 64 fractures with internal fixation using a "π" plate. Elbow, shoulder and wrist mobilization was started immediately after operation for the internal fixation group and after removal of external fixation. The mean follow-up was 12 months. Clinical evaluation was done using the modified Gartland and Werley's Functional Scoring System. Radiographic evaluation was done using the modified Lindstrom Radiographic Scoring System. **Results and complications.** clinical outcome was equal in both groups of patients, in contrary to the radiological outcome that was superior in the group of patients with an AO/ASIF type B and C fracture treated with open reduction and internal fixation with a "π" plate. Major complications were not observed in any of the two groups. In the group of internal fixation, 2 patients developed synovitis of the extensors tendons, and 1 patient reflex sympathetic dystrophy that resolved after intense physical therapy. **Conclusion.** Although a shorter surgical time with closed reduction and external fixation that preserves the surrounding soft tissues and the fracture haematoma,

less soft tissues lesions by the application of external fixation, open reduction and internal fixation using a "π" plate has been associated with a better functional outcome in patients with complex distal radius fractures that could not be treated by closed technique. We consider that the late functional result does not depend exclusive on the accurate anatomic reduction of the fracture, but also on the type of the fracture and the physiotherapeutic protocol followed.

Blount disease treated with TSF (taylor spatial frame) external fixator. Mobilization

H. Tsididakis¹, A. Farmakidis², V.I. Sakellariou¹, V. Tsouparopoulos¹, G. Karaliotas¹, G. Mazis¹, A. Kanellopoulos¹

¹1st Orthopaedic Department, University of Athens, ATTIKON University General Hospital, Greece

²Physical Medicine and Rehabilitation of Asklipio Voulas Athens, Greece

Introduction. To evaluate the operative treatment of Blount disease using the TSF external fixator and to evaluate the system. **Materials and methods.** During January 2004 and August 2008, 8 males and 2 females with Blount disease (16 limbs) were treated using TSF system. For the radiological assessment we obtained standard long-leg standing radiographs and we measured the anatomic medial proximal tibial angle (aMPTA), the diaphyseal-metaphyseal tibial angle (Drennan), and the femoro-tibial angle. **Results.** The mean follow-up was 29 months (15 to 45). No patient had pain around the knee, medial or lateral instability. The range motion of the knee immediately after frame removal was 10° to 90° of flexion in two patients while in the other it was from 0° to 110°. The mean leg-length discrepancy was reduced postoperatively from mean 1,9 cm (1,7-3,2) to 0,9 cm (0- +1,5). The aMPTA angle increased from mean 73° (59°- 83°) to 94° (107°- 90°), Drennan angle from 17° (14°- 22°) to 3° (0°- 7°), and femoro-tibial angle from 17° (10°- 30°) varus to 7° (2°- 10°) valgus. The frame was removed at mean 9 weeks (7-14). Two patients had delayed union, two presented with loss of correction (due to dissociation of struts and secondary to medial physeal bar), two patients had pin track infection. No neurologic complications were referred. **Conclusion.** Accurate corrections of multiplanar deformities as varus, internal rotation and shortening of the limb that coexist in Blount disease may be accomplished using TSF system.

Clinical outcome of lower limb deformities treated with tsf (taylor spatial frame) and early mobilisation

H. Tsididakis¹, V.I. Sakellariou¹, A. Farmakidis², G. Karaliotas¹, V. Tsouparopoulos¹, M. Kaligerou³, A. Kanellopoulos¹

¹1st Orthopaedic Department, University of Athens, ATTIKON University General Hospital, Greece

²Physical Medicine and Rehabilitation of Asklipio Voulas Athens, Greece

³National Rehabilitation Hospital, Athens, Greece

Aim. To study the clinical outcome of TSF system combined with early mobilization in treating lower limb deformities in children **Materials and methods.** From January 2004, in 61 children (37 male and 24 female), 67 extremities, with a mean age 8.9 years, a TSF external fixator was applied for the treatment of trauma or bone deformities. 21 children were operated for angular deformity, 19 for bone lengthening, 10 for rotational deformity, 6 for combined angular deformity and lengthening and 11 for pseudoarthrosis. Intra and postoperative difficulties were classified using the Palay method in problems, obstacles and complications. An intensive therapeutic protocol was adopted including early mobilization, partial weight bearing and muscle strengthening exercises immediately after surgery. **Results.** There was a 5.9% (4/67) TSF system failure rate including 2 cases of axial mal-alignment, 1 case of pin fracture and 1 case of knee subluxation. There were 3 cases with delayed bone healing that needed infusion DBM, 1 peroneal nerve palsy due to hematoma formation treated with decompression of the region, 1 early bone fusion that needed re-operation and 2 cases of percutaneous achilles lengthening. Complications presented in 5.9% of (4/67) the cases including 1 fracture, 1 pseudoarthrosis, and 1 peroneal nerve palsy. Mean postoperative range of motion was good in 66/67 cases (knee flexion >120 degrees, extension 0-5 degrees) with only one cases presenting with limitation of arc of motion. **Conclusion.** Combination of TSF with early mobilization and intensive physiotherapeutic program was associated with an excellent postoperative clinical outcome in children with lower limb deformities.

Congenital talipes equinovarus treated with ponseti method

H. Tsibidakis¹, A. Farmakidis², V.I. Sakellariou¹, G. Karaliotas¹, G. Mazis¹, M. Kaligerou³, A. Kanellopoulos¹

¹1st Orthopaedic Department, University of Athens, ATTIKON University General Hospital, Greece

²Physical Medicine and Rehabilitation of Asklipio Voulas Athens, Greece

³National Rehabilitation Hospital, Athens, Greece

Introduction. The presentation of the early results using Ponseti method in correcting congenital talipes equinovarus. **Materials and methods.** During the period from January 2004 to December 2008, 11 infants (7 male- 4 female) with a mean age of 180 days (from 20 to 270), were treated with Ponseti method for talipes equinovarus. Seven of the patients (63.6%) had bilateral deformity. In order to correct deformity we applied plaster fixation, which we changed weekly in infants up to 8 weeks old and every 2 weeks in older infants. The mean value of follow up was 13 months (6-28 months). **Results.** We had excellent clinical and radiological results. We performed Achilles tendon release in 16 feet, as indicated by the Ponseti method. The radiograph measures, which were used, involved talus-calcaneal angle in AP and lateral projection, talus-1st metatarsal angle in AP view and calcaneal position in AP view. **Conclusion.** The treatment of congenital talipes equinovarus using Ponseti method results in excellent early outcome by achieving painless, flat, flexible foot without any complications.

Acute dislocation of acromioclavicular joint (ACJ) treated with a modification of weaver-dunn method

V.I. Sakellariou¹, H. Tsibidakis¹, A. Farmakidis³, E. Fandridis², S. Spiridonos², F. Giannoulis², N. Gerostathopoulos²

¹1st Orthopaedic Department, University of Athens, ATTIKON University General Hospital

²Hand Surgery-Upper Limb-Microsurgery Department, General Hospital KAT, Athens, Greece

³Physical Medicine and Rehabilitation of Asklipio Voulas Athens, Greece

Introduction. Weaver-Dunn is an established surgical technique Rockwood type III, IV, V and VI injuries. The purpose of our study is to present a modification of Weaver-Dunn surgical technique applied in patients with acute ACJ dislocation. **Materials and methods.** During January 2007 to September 2008, 15 patients with a mean age 27 years (range, 20-42) were managed operatively. 10 cases were type III and 5 cases type V acute (<3 weeks) ACJ dislocations. The right/left limb ratio was 13/2. Mean follow up was 10 months (6-14). The surgical technique performed included resection of the distal (approximately 8mm) part of clavicle, resection of posterior half of coraco-acromial ligament and fixation of this part to the clavicular edge. Reduction, fixation of the clavicle and reconstruction of coraco-clavicular ligaments was performed using strong synthetic suture looped around coracoid process. The anterior half of coraco-clavicular ligament remained intact in all cases. In 2 cases we used posterior 2/3 of coraco-acromial ligament due to the ligament's small diameter. **Results.** There was 1 patient with postoperative wound haematoma which was self-recessed and 1 patient with recurrent dislocation due to clavicular fracture. 12 out of 15 patients returned to previous sport activities. **Conclusion.** Modification of technique consists of preserving the anterior part of coraco-acromial ligament offering a relative stability of coraco-acromial arc. The disadvantage of this technique is the high cost of synthetic suture. A long-term study could confirm the advantage of coraco-acromial ligament preservation in the treatment of acute or chronic dislocations of the acromioclavicular joint.

Internal hemipelvectomy and reconstruction for periacetabular sarcomas. Clinical outcome and applied physiotherapeutic protocol

H. Tsibidakis¹, V.I. Sakellariou¹, A. Farmakidis², G. Mazis¹, G. Karaliotas¹, M. Kaligerou³, P. J. Papagelopoulos¹

¹1st Orthopaedic Department, University of Athens, ATTIKON University General Hospital, Greece

²Physical Medicine and Rehabilitation of Asklipio Voulas Athens, Greece

³National Rehabilitation Hospital, Athens, Greece

Introduction. Presentation of two cases of pelvic periacetabular sarcomas, which were treated with wide resection of the tumor, pelvic reconstruction and lower limb salvage. **Materials and methods.** Two patients, one male 23 y.o. with chondrosarcoma and one female 75 y.o. with chondroblastic osteosarcoma, were treated in our clinic. Both tumors were stage II according to Enneking's classification. Both tumors were treated with Enneking type II internal hemipelvectomy due to their periacetabular localization. After wide resection of tumors, pelvic deficit was reconstructed with allograft, which was internally fixated, and total hip replacement with constrained prosthesis. **Results.** Clinical evaluation showed absence of pain and satisfactory function of the limb. Imaging evaluation with x-ray, 3D-scan και MRI showed satisfactory position and condition of allograft and internal fixation without evidence of loosening. Non weight bearing mobilization commenced 3 weeks postoperatively. **Conclusion.** Internal hemipelvectomy requires precise preoperative planning and surgical knowledge because it is technically demanding due to complex structure of the pelvis, the great number of muscular attachments and the presence of important vessels, nerves and pelvic viscera. Wide pelvic resection and reconstruction with allograft for periacetabular sarcomas is a challenging procedure, which offers the opportunity of limb salvage associated with functional outcome.

Limb salvage using a new intramedullary diaphyseal segmental fixation system

V.I. Sakellariou¹, Af. Mavrogenis¹, H. Tsibidakis¹, G. Mazis¹, A. Farmakidis², Pj Papagelopoulos¹

¹1st Orthopaedic Department, University of Athens, ATTIKON University General Hospital, Greece

²Physical Medicine and Rehabilitation of Asklipio Voulas Athens, Greece

Introduction. Advances in imaging, surgical techniques, radiation therapy, and chemotherapy; patients with bone malignancies have had a considerable improvement in prognosis of diaphyseal malignant bone lesions. **Aim.** To present preliminary results from the use of an intramedullary diaphyseal segmental defect system for limb salvage after primary or metastatic tumour resection. **Materials and methods.** Six patients underwent wide segmental resection and limb salvage surgery for primary or metastatic bone tumors involving the diaphysis of the femur, the tibia and the humerus using a modular intramedullary diaphyseal segmental defect fixation system. There were 4 men and 2 women with a mean age of 62 years (range, 40 to 77 years). Histological diagnosis included adamantinoma, dedifferentiated synovial sarcoma attached to the tibia, multiple myeloma, and metastatic renal cell carcinoma, myeloid carcinoma of the thyroid gland and metastatic adenocarcinoma of the stomach. **Results.** The mean follow-up was 16 months (range, 11 to 24 months). At the latest examination, 5 patients were free of local or distant disease; one patient had deceased with distant disease, without evidence of local recurrence. Revision surgery was necessary in one patient because of mechanical loosening of the proximal fixation of the prosthesis. The mean increase of the Enneking rating from the pre to the postoperative status was 87.82%. **Conclusion.** The intramedullary diaphyseal segmental defect fixation system used herein is associated with a satisfactory functional and oncological outcome after wide resection of diaphyseal bone tumors.

Tibial adamantinoma managed with intramedullary diaphyseal segmental defect fixation system

V.I. Sakellariou¹, Af. Mavrogenis¹, H. Tsibidakis¹, A. Farmakidis², A Mazis¹, V.Tsouparopoulos¹, Pj Papagelopoulos¹

¹1st Orthopaedic Department, University of Athens, ATTIKON University General Hospital, Greece

²Physical Medicine and Rehabilitation of Asklipio Voulas Athens, Greece

Introduction. Adamantinoma is a primary low grade bone tumour. It is predominantly located in the mid-shaft of the tibia and accounts for 0.1 to 0.5% of all primary bone tumours. Histologically, classic adamantinoma is a biphasic tumour characterized by epithelial and osteofibrous components that may be intermingled with each other in various proportions and differentiating patterns. Radiographically, it has a clearly defined outline with a

bubbly appearance and increases the width of bone. **Materials and methods.** We present a case of adamantinoma of the tibia, in which a new intramedullary diaphyseal segmental defect system was used for limb salvage after en bloc resection. The follow up was 24 months and there was no local tumor recurrence. Enneking functional evaluation system revealed a 92% rating and an increase of 82% comparing to the premorbid status. **Discussion.** Adamantinoma is a very rare bone tumor. Histological diagnosis is often difficult. Treatment usually consists of wide resection and reconstruction using an allograft, a vascularized fibula or combination of two. Reconstruction of the defect using an intramedullary diaphyseal titanium spacer is another reconstructive option. **Conclusion.** Intramedullary segmental defect fixation system offers good early functional outcome after resection of adamantinoma, avoiding complications related to other methods of reconstruction.

Inpatient Rehabilitation of Patients with Medically Unexplained Disability

Ahmad Al-khayer, Breda Cullen

*Al-khayer Specialist Registrar in Rehabilitation Medicine
Cullen Clinical psychologist*

Introduction. Prospective observational study reporting our accumulative experience with patients presenting primarily with medically unexplained disability. **Aims.** To study the effects of inpatient rehabilitation on patients with medically unexplained disability. **Materials and methods.** Between November 2007 and October 2009, 10 patients with neurological symptoms, primarily gait impairment but without any neurological or musculoskeletal diagnoses, were admitted to the Physically Disabled Rehabilitation Unit PDRU. Multidisciplinary team input focusing on consistent behavioral reinforcement and function-focused therapy were the main therapy modules. Psychological therapy was offered to all patients. Functional Independence Measure (FIM) was used to assess response to inpatient therapy. **Results.** Mean age was 40 (23-57). Nine female. All patients had abnormal gait. Additional unexplained symptoms in some patients included high tone, tremor, pain, weakness, and numbness. Mean length of stay was 22 days (2-50). Median FIM improvement was 7 points (0-23). FIM improved in 7 patients by ≥ 5 points. FIM did not change in 3 patients: one refused any therapy and self discharged at two days; another self discharged after one week for social reasons; and the last patient's FIM did not change because of a ceiling effect. None of the patients fully accepted medically unexplained symptoms as a diagnosis; 3 patients agreed that psychosocial factors had an influence on their ongoing symptoms. One patient only agreed to have psychological therapy. **Conclusion.** Most patients improved during inpatient admission despite not accepting the diagnosis of medically unexplained symptoms. Further research on how these patients behave in the community after discharge may be recommended.

Ultrasound Guided Injection Technique in Rehabilitation Medicine

P.C. Chen, S.F.T. Tang

Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Taiwan

Introduction. Ultrasound is a radiation-free, easy-to-use imaging tool in diagnosing soft tissue lesions and in performing ultrasound guided injections. Our previous study results have documented that ultrasound can be applied in performing ultrasound guided subacromial bursitis injections and aspirations in treating patients with shoulder impingement syndrome. Ultrasound can also be applied in performing accurate sacral hiatus epidural spine injections. Under ultrasound guidance, the advancing motion of the needle can be observed as continuous and real-time images. In our recent works, we have shown that ultrasound may also be used as an effective screening tool for judging the success rate of caudal epidural injections. **Materials and methods.** Sonographic images of the sacral hiatus were obtained from patients with low back pain and sciatica who were to receive caudal epidural injection treatments. The LOGIQ 9 ultrasound machine (GE Healthcare, PO Box 414, Milwaukee, WI, 53201) was used in our study. The M12L real-time

linear-array ultrasound transducer with a bandwidth of 5.0 to 13.0MHz was selected. Sonographic images of the sacral hiatus area were obtained from a physiatrist who had years of experience in handling and interpreting sonographic images. **Results.** In sacral hiatus epidural injections, 100% accuracy in caudal needle placement into the caudal epidural space under ultrasound guidance was confirmed by contrast dye fluoroscopy. Sonographic images indicating a closed sacral canal and sacral diameters ranging from 1.2 to 1.6 mm may suggest a higher failure rate in caudal epidural injection. **Conclusion.** The significant improvements in shoulder pain and range of motion after ultrasound-guided injection in treating shoulder impingement syndrome suggest that a higher volume of steroid-lidocaine suspension can be accurately infiltrated into the lesion site as compared with the conventional blind injection technique. Ultrasound guidance can ensure accurate needle placement into the sacral hiatus for successful caudal epidural injections. Sonographic images of the sacral hiatus can also provide us with crucial information on whether caudal epidural injections can be performed successfully.

References

1. Chen CP, Tang SF, Hsu TC, Tsai WC, Liu HP, Chen MJ, Date E, Lew HL. Ultrasound guidance in caudal epidural needle placement. *Anesthesiology* 2004;101:181-184.
2. Chen MJL, Lew HL, Hsu TC, Tsai WC, Lin WC, Tang SFT, Lee YC, Hsu RCH, Chen CPC: Ultrasound-Guided Shoulder Injections in the Treatment of Subacromial Bursitis. *Am J Phys Med Rehabil* 2006;85:31-35. Corresponding Author
3. Lew HL, Chen CP, Wang TG, Chew KT. Introduction to musculoskeletal diagnostic ultrasound: examination of the upper limb. *Am J Phys Med Rehabil* 2007; 86, 310-21.
4. Carl PC Chen, Simon FT Tang, Chih-Chin Hsu, Ruo Li Chen, Rex CH Hsu and Max JL Chen. A Novel Approach to Sonographic Examination in a Patient with Calf Muscle Tear. *J Med Case Reports*, July 2009.
5. Chen CP, Wong AM, Hsu CC, Tsai WC, Chang CN, Lin SC, Huang YC, Chang CH, Tang SF. Ultrasound as a Screening Tool for Proceeding with Caudal Epidural Injections. *Arch Phys Med Rehabil* 2010 (In Press, March edition, 2010).

Extracorporeal shock wave therapy in the treatment of lateral epicondylitis; Does number of sessions make any difference? Is sonography effective in the diagnosis and evaluation of treatment outcomes?

Nural Albayrak Aydin¹, Eser Sanverdi², Filiz Fitoz³, Kamil Yazicioglu¹

¹*Department of Physical Therapy and Rehabilitation, Guven Hospital, Ankara, Turkey*

²*Department of Radiology, Hacettepe University Faculty of Medicine, Ankara, Turkey*

³*Department of Radiology, Guven Hospital, Ankara, Turkey*

Introduction. This study was undertaken to compare the effectiveness of extracorporeal shock wave therapy (ESWT) application for 3 or 5 sessions, in the treatment of lateral epicondylitis. Furthermore, to find the role of sonography in the diagnosis of lateral epicondylitis and in demonstration of the short term effect of ESWT. **Materials and methods.** A total of 25 patients (20 women, 5 men) with lateral epicondylitis were recruited for the study (median age 45.84±6.56 yrs, range 33-60; median pain duration 7.72±9.33 months, range 1-36). The patients were randomly assigned to receive extracorporeal shock wave therapy either three (Group A) or five (Group B) sessions. The outcome measures were Visual Analogue Scale (VAS), the subjective rating of physical function with Disabilities of the Arm, Shoulder and Hand questionnaire (DASH), maximal grip strength on the affected side and sonography findings. All patients were evaluated 2 times: before treatment and at two months after the end of the treatment. **Results.** Statistical analysis (analysis of variance for repeated measures) revealed significant increase in grip strength ($p<0.001$), significant decrease in VAS ($p<0.001$) and DASH ($p<0.001$) after ESWT treatment in both groups compared with pre-treatment score. However, no significant difference in grip strength ($p=0.829$) and DASH ($p=0.442$) but in VAS ($p=0.005$) was found between the two groups after ESWT treatment. There was no statistically difference between groups according to sonography findings. But patients who were screened as complete healing in sonography after ESWT treatment showed significant improvement in outcome measures. **Conclusion.** ESWT, regardless of the number of sessions, is safe and improves the symptoms of most patients with a painful elbow. Sonography is an effective tool in diagnosis and monitoring treatment of lateral epicondylitis.

The effect of Tilt-Table Therapy on Pulmonary Functions in Tetraplegic and High Level Paraplegic Patients

Devrim Ilbars¹, Mehmet Taşkıyatan¹, Kamil Yazıcıoğlu¹, Nural Albayrak Aydın²

¹Gulbane Military Medical Academy Department of Physical Medicine and Rehabilitation, Ankara, Turkey

²Güven Hospital Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Introduction. The positive effect of tilt table therapy has been shown in the management of orthostatic hypotension, to prevent bone density loss, and for the evaluation of neurocardiogenic syncope. However as far as we know, there is not an article in the literature, investigating the relationship between standing table and pulmonary functions. **Materials and methods.** 29 spinal cord injured (SCI) patients were enrolled in the study 24 of them were tetraplegics and 5 of them were high paraplegics (Th5 and higher). Patients were randomized into two groups sequentially. While the study group took one hour tilt table therapy twice a day for 6 weeks, the control group did not. The patients in the both groups took the same standard exercise program including progressive resistive and spirometric exercises. The pulmonary functions were tested by Sensormedic V 20 Ers (1993) before and after the study. **Results.** The pulmonary functions of both groups were similar in the beginning. At the end of the study, while the improvements in FVC, FEV1, FEF 25-75%, and FEF 50% were statistically significant in both the study and control groups ($p < 0.05$), the improvements in FEV1/FVC and VC were found statistically significant in the study group only. **Conclusion.** We conclude that tilt table therapy can also be used to support pulmonary functions in spinal cord injured patients.

The therapeutic effects of physical therapy, local steroid injection and eswt in patients with lateral epicondylitis: clinical and sonographic comparison

R. Yazıcı¹, P. Borman¹, S. Kocaoglu¹, L. Ozcakar L²

¹Ankara Training and Research Hospital

²Hacettepe University, Departments of PMR Ankara, Turkey

Background and purpose. There is lack of scientific evidence for the treatment of lateral epicondylitis and the therapy remains controversial. The aim of this study was to evaluate clinically and sonographically the effects of physical therapy, local steroid injection and ESWT (Electrical shock-wave therapy) in lateral epicondylitis. **Materials and methods.** Patients who were seen for lateral elbow pain (>3 months) and who were clinically diagnosed as lateral epicondylitis were enrolled. The study group comprised 38 female and 21 male subjects (62 elbows) with a mean age of 44.75 ± 9.63 years. Patients were randomized into three treatment groups; physical therapy (hot pack, ultrasound and friction massage) (N: 21), local steroid injection (N: 21) and ESWT (N: 20). Outcome parameters were determined as pain intensity by VAS, grip and pinch strength, and common extensor tendon thickness assessed by ultrasonography (US). These parameters were evaluated at baseline (before treatment) and on the 6th month in all patients. **Results.** All of the outcome parameters were improved at the end of sixth month when compared with baseline (all $p < 0.05$). When the three groups were compared, change in VAS and grip/pinch strength values were similar between the groups ($p > 0.05$). The decrease in tendon thickness measurements indicating the improvement in tendons, were found to be different between the groups. The decrease in patients who received injection or ESWT therapies was statistically greater than that of patients who received physical therapy. The improvement in injection and ESWT therapies were found to be similar. **Conclusion.** All the three methods seem to be effective in the treatment of lateral epicondylitis as far as clinical and functional measurements are concerned. Regarding the decrease in the common extensor tendon, local steroid injection and ESWT seem to be superior to physical therapy.

The study of vestibular function in patients with multiple sclerosis

Abir H. Naguib¹, Ghada A. Achmawi², Hisham Kozo³, Amr M. Fatatry²

Physical Medicine, Rheumatology and Rehabilitation

¹Neurology

²Audiology

³Departments Faculty of Medicine, Alexandria University, Egypt

Introduction. Disturbances of balance and gait are commonly observed in patients with multiple sclerosis (MS). Loss of postural stability is frequently reported as the initial symptom. ⁽¹⁾ There is evidence that demyelinating lesions cause visual dysfunction and somatosensory deficits. ⁽²⁾ However, there is paucity of researches that are interested in evaluating the role of vestibular function in postural stability in MS patients. This study aimed at evaluating the vestibular function in MS patients and assessing the severity of dysfunction if any. **Materials and methods.** Thirty -six MS patients diagnosed according to Poser and McDonald criteria (30 relapsing remitting, 4 secondary progressive and 2 primary progressive) were compared to twenty age and sex-matched healthy controls. MS patients included 28 females and 8 males (21-44 years). The mean disease duration was 5.5 ± 4.4 years. Patients underwent complete neurological evaluation including Kurtzke Expanded Disability Status Scale (EDSS) together with sensory organization test (SOT) component of computerized dynamic posturography and electronystagmography (ENG) full test battery. **Results.** Compared to controls, MS patients had significantly low composite equilibrium score and significantly low vestibular (94 %), visual (78%) and somatosensory (33%) ratios of the SOT in order of incidence. ENG results showed signs of peripheral vestibulopathy in 55 % of patients and signs of central vestibulopathy in 35 % of patients. **Conclusion.** Patients with multiple sclerosis had evidence of vestibular dysfunction. Vestibular as well as visual dysfunctions dominated the sensory abnormality of postural instability in MS patients. ENG is important in localizing and lateralizing the vestibular dysfunction.

References

1. Compston A, Coles A. Multiple Sclerosis. Lancet 2002;359: 1221-1231.
2. Miller AE. Clinical Features . In: Cook S,ed.Handbook Of Multiple Sclerosis. New York Ny:M Dekkr 1990:169-186.

Sympathetic skin response in relapsing remitting type of multiple sclerosis

Hayam M Abdel Ghani¹, Ghada A. Achmawi²

Physical Medicine, Rheumatology and Rehabilitation

¹Neurology

²Departments Faculty of Medicine, Alexandria University, Egypt.

Introduction. Function of the autonomic nervous system may be compromised in multiple sclerosis (MS). ⁽¹⁾ Because conventional electrophysiological methods do not assess the autonomic nervous system, simple reproducible tests were developed. One of them is sympathetic skin response (SSR), which provides useful information about the status of sympathetic post-ganglionic function.⁽²⁾ This work aimed at studying peripheral sympathetic autonomic function in patients with relapsing remitting MS and its correlation to disease severity. **Materials and methods.** Thirty-one MS patients were compared to fifteen age- and sex-matched healthy controls. MS patients included 7 males and 24 females (age ranging from 21-50 years). Mean disease duration was 4.56 ± 3.4 years. The Kurtzke expanded disability status scale (EDSS) was used to assess disease severity. SSR was performed for MS patients as well as the controls. **Results.** The EDSS scores in MS patients ranged from 2-6 (mean; 4.32 ± 1.28). MS patients were classified into non-responders and responders based on the response to SSR. Among the 31 patients, 6 showed complete absence of SSR from the four limbs, while another 12 patients showed absent response from lower limbs only. This group was defined as non- responders. Regarding the responders (13 patients), there was significant difference between MS patients and controls as regards amplitude of the response in upper limbs ($t = 5.133$, $P < 0.0001$) and latency and amplitude in lower limbs ($t = 5.256$, $P < 0.0001$; $t = 9.166$, $P < 0.0001$ respectively). EDSS was found to be correlated with some SSR parameters. **Conclusion.** Peripheral autonomic dysfunction is evident in MS patients. SSR seems to be a simple and effective means of assessing sympathetic autonomic outflow disturbances in MS. Its inclusion can provide a valuable addition to current electrophysiological procedures for the detection of MS lesions.

References

1. Elie B, Louboutin JP. Sympathetic skin response (SSR) is abnormal in multiple sclerosis. Muscle Nerve 1995; 18(2):185-9.
2. Haensch CA, Jörg J. Autonomic dysfunction in multiple sclerosis. J Neurol 2006 ; 253 Suppl 1:13-9.

Motor Evoked Potential Changes following Bilateral Arm Training With Rhythmic Auditory Cueing In Chronic Hemiplegia

Tarek S. Shafshak, Wahid Aly, Enas Shaheen.

Department of Physical Medicine, Rheumatology & Rehabilitation, Faculty of medicine, Alexandria University, Alexandria, Egypt

Introduction. Some stroke patients continue to have residual disability in hand function. Repetitive bilateral arm training with rhythmic auditory cueing (BATRAC), which provides an attention goal that promotes motor relearning, has been recommended for chronic stroke patients with poor hand function, but it seemed not always efficacious. *The study aimed at* investigating the effect of BATRAC on upper extremity functional performance (UEFP) and motor evoked potential (MEP). **Materials and methods.** *Design:* Case series. *Participants:* Forty patients with first ever-unilateral stroke (3 months to 10 years duration). Exclusion criteria were: any other associated neurological diseases, insufficient communication, unsatisfactory general condition and the presence of contra-indications for trans-cranial magnetic stimulation. *Interventions:* Patients participated in BATRAC (3 sessions/week) for six consecutive weeks. *Main Outcome Measures:* The UEFP was evaluated by the Fugl-Meyer (FM) Motor Performance test, Wolf Motor Function Test and Arm Motor Ability Test. Transcranial magnetic stimulation (TMS) was used to elicit motor evoked potential (MEP) to the abductor digiti minimi and the central motor conduction time (CMCT) was calculated. These were performed before and after BATRAC. **Results.** At the 1st assessment, MEP was obtainable from the paretic side in 23 patients. The pre-treatment MEP parameters (TMS threshold, CMCT and MEP amplitudes) obtained from the paretic limbs were significantly different from these recorded from the non-paretic limbs. Following BATRAC, there were significant ($P<0.01$) improvement in UEFP (in all patients), decrease in TMS threshold, decrease in the CMCT and increase in MEP amplitude on the paretic side (in patients with obtainable MEP at 1st assessment). Among the 17 patients with unobtainable MEP from the paretic limb at 1st assessment, MEP became obtainable in 12 patients following BATRAC. **Conclusion.** BATRAC for 6 weeks improved both UEFP and MEP parameters in chronic stroke patients suggesting that functional improvement might have been due to cortical reorganization.

Patients with refractory angina treated with enhanced external counterpulsation show functional recovery at long-term follow-up

D.L. Braverman¹, C. Crane,¹ L.M. Adamczyk², M.A. DiVita², C.V. Granger³

¹Braverman and Crane: Albert Einstein Medical Center, 700 Cottman Avenue, Building B, Lower Level, Philadelphia, PA

²Adamczyk and DiVita: Uniform Data System for Medical Rehabilitation, 270 Northpointe Parkway, Suite 300, Amherst, NY

³Granger: University at Buffalo, State University of New York, 270 Northpointe Parkway, Suite 300, Amherst, NY 14228 LIFeware is a trademark of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.

Introduction. Enhanced external counterpulsation (EECP), a physical therapy for angina, uses electrocardiographic sequencing to trigger pneumatic leg cuffs. EECP augments systemic and coronary perfusion pressure, venous return, and cardiac output, while reducing left ventricular afterload. This prospective cohort study aims to measure the long-term effects of EECP on functional status. **Materials and methods.** 302 refractory angina patients underwent EECP. The main outcome measures were collected using the LIFewareSM System, a comprehensive, valid, and reliable tracking and reporting system for functional outcomes. Patients were assessed at baseline, after EECP, and in follow-up at 1-6 months (n = 178), 7-12 months (n = 75), and more than 12 months (n = 49). **Results.** Patients received an average of 43 EECP treatments and then rated functional satisfaction. Values ranged from 0 to 100; higher numbers referencing more ability or less distress. Ratings of 70 or above defined a pre-specified threshold of clinical significance. 267 of 302 patients (88.4%) responded favorably to EECP with improvement in all functional measures in all follow-up groups, especially dyspnea/angina, physical fatigue, cognitive fatigue, sleep, and role participation (paired t-test $p < 0.001$). Patients initially not responding favorably to EECP (11.6%) showed improvement in dyspnea/angina at 1-6 months ($p = 0.009$) and 7-12 months ($p = 0.030$). There were no adverse events. **Conclusion.** EECP enables refractory angina

patients to achieve significant improvements in all functional measures that persist more than one year. A subset of patients who do not respond initially may display significant anginal relief up to one year later.

References

Loh PH, Cleland JGF, Louis AA, et al. Enhanced external counterpulsation in the treatment of chronic refractory angina: a long-term follow-up outcome from the International Enhanced External Counterpulsation Patient Registry. Clin Cardiol 2008; 31:159-164.
Granger CV. Featured instrument. The Lifewaresm System. Journal of Rehabilitation Outcomes Measurement. 1999;3(2):63-9.

Assessment of risk of falls in elderly people at home.

F. Vallone², M. Repetto¹, C. Giorgini², N. Corrieri²

¹Fondazione Maugeri Genova

²E.O. Ospedali Galliera di Genova, S.C. Recupero e Riabilitazione Funzionale

Introduction. We compared the sensitivity and accuracy of different methods for assessing the risk of falling by highlighting the degree of reliability and predictability, consider the application of them within a protocol for prevention falls and determining to what extent the outcome is stable for a large population of healthy subjects or with pathological findings stabilized. **Materials and methods.** Were examined a group of 9 individuals, average age 66.2 years (range 63-70), and a group of 13 individuals with mean age 76.6 years (range: 71-86). All had a MMSE> 28/30 and a history negative for previous falls, neurological disorders, rheumatology and osteoarticular. We assisted with the examination stabilometric platform (ARGO, RGM) scale of Berg likely to define the final risk score for accuracy and ease of administration. The test was conducted for three sessions on three successive days: the subjects have risen by placing bare feet on the platform with an aperture of 30 ° with heels distance of 4 cm. Each acquisition lasted 30". The test, first with eyes open and then closed, was repeated three times in each session. **Results.** In the two groups are known tendency to deterioration of performance posturography with age and with the closing of the eyes. The evaluation with BBS showed a trend towards less stability of subjects in the group of older, returning an average of 54/56 compared with a value of 56/56 of the age group less. The first group had more difficulty in performing the tasks of the 11/12/14 test, with the achievement of the maximum points in these exercises in 69.3%. As noted with some support for the BBS trend also emerged in the evaluation platform that subjects with older age, even in the absence of diseases that are risk factors for falls, have less stability than those of absolute age. **Conclusion.** The concordance of results obtained using the two scenarios can be an indicator of validity of both systems to detect, by different methods, the level of this increased risk among subjects older.

References

Baratto L,AA: Progetto di studio per la validazione di uno score di funzionalità posturale.2007;

Rehabilitation of War-Related Lower Limb Amputees in Kosovo

Introduction. For the first time, in Kosovo, after the war 1998/1999 was developed a training programme for lower limb amputees. Humanitarian Organization - Handicap International provided training to our physiotherapists for rehabilitation i.e. prosthetic rehabilitation of amputees, as well as prosthetists for manufacture of more functional prosthesis. All this encouraged us to analyze and show the achieved success in this piece of work. The main aim was to investigate the influence of factors: the amputation level and the time lag between surgery and prosthetic rehabilitation, on the rehabilitation duration and outcome. **Materials and methods.** We reviewed the records of 101 war-related lower limb amputees who had inpatient rehabilitation at the National Ortho-Prosthetic Center of Kosovo in Pristina, from July 1999 to June 2001, a retrospective cohort study. Assessments of rehabilitation outcome are made on a 3-point scale adapted from the form provided by Humanitarian Organization - Handicap International. **Results.** The amputation level was shown as an important predictor for the rehabilitation duration and outcome. The cohort analysis has confirmed the amputation level to be of biggest importance. Early prosthetic rehabilita-

tion, was shown as a factor of influence on the rehabilitation duration in all cases ($r=0.22$, $P=0.027$). This predictor was relevant for the rehabilitation outcome, as well. The most frequent type of prosthesis manufactured for our amputees, was the patellar tendon bearing below-knee prosthesis with suspension band (36.9%). **Conclusion.** Amputation of the limb should be performed as lower as possible. If there are the possibilities for prosthetic rehabilitation, any delays must be avoided, particularly in war-related lower limb amputees.

References

1. Pohjolainen T, Alaranta H. Predictive factors ability after lower-limb amputation. *Ann Chir Gynaecol*, 1991;80:36-9.
2. MacKenzie EJ, and coauthors. Functional Outcomes Following Trauma-Related Lower-Extremity Amputation. *J Bone Joint Surg*, 2004;86:1636-1645.

Self-reported functions causing inconvenience to LBP patients

C. Suominen, K. Laimi, J.J. Salminen, R. Tuominen

Department of Physical and Rehabilitation Medicine, Turku University Central Hospital, Finland, Department of Public Health, University of Turku, Finland.

Introduction. To study the type and occurrence of self-reported functions causing inconvenience to LBP patients. **Materials and methods.** The data was based on a systematic sampling of 42 physicians' referrals due to LBP to the outpatient clinic of Physical and Rehabilitation Medicine. Using a self-administered questionnaire the patients were asked to list all functions in their everyday life which were causing inconvenience to them by their LBP. The order or the number of functions were not limited. After writing each function the patient was asked to indicate the importance of that particular function to their everyday life using double anchored visual analogue scale (VAS) with endpoints 0) not at all important and 100) extremely important. Altogether 39 patients returned acceptably filled questionnaire. Later patient reported functions were coded to distinct categories. The small number of cases did not allow detailed statistical evaluation. **Results.** The number of functions mentioned varied from three to eighteen, aggregating altogether 327 functions. From these functions 24 distinct categories were formed. The most commonly mentioned categories were sitting (41), bending (34), walking (30) and sleeping (29). Women mentioned altogether 258 functions from all 18 categories. Among them the most commonly mentioned were sitting (30), bending (25), walking (25) and housework (23). Men mentioned 69 functions, from 11 categories. The most commonly mentioned were sitting (11), bending (9) and sleeping (8). On average the most important for women were bending (48.3), housework (45.8) and sleeping (44.2) and for men walking (32.7) and bending (32.1). Overall, women considered all categories more important (37.1) than men (30.1). **Conclusion.** Self-reported functions causing inconvenience were mainly those also included in ready-made lists used by professionals. However, some typical function measuring bending ability could make such lists more comprehensive.

Study of effect of Robotic therapy on the gait strategy in patients after stroke.

A.S. Klochkov, A.V. Voronov, A.A. Telenkov, L.A. Chernikova
Research Center of Neurology of RAMS, Moscow, Russia.

Introduction. Many poststroke patients have abnormal synergistic patterns characterized as highly stereotyped and obligatory. For each extremity exists two distinct abnormal synergy patterns: a flexion synergy and an extension synergy. It is known that these synergies are often observed in patients even when the paresis is reduced. Our goal was to estimate the effects of the Lokomat training on the clinical parameters and some gait synergies in post-stroke patients. **Materials and methods.** 15 hemiparetic stroke subjects were divided into 2 groups: the group with flexion and extension synergy. Rehabilitation course includes 10-20 sessions with body weight support $35.6\pm 3.7\%$ in the sequel reduced to 5 - 0%; mean treadmill speed 1.56 ± 0.18 km/h, guidance force changed from 100% to 15%. Before and after rehabilitation course we assessed gait characteristics, and biomechanical parameters of gait using clinical scales and videoanalysis motion system. **Results.** Assessments of NIHSS decreased at 16,1%, Ashworth scale at 41,1%, Motoricity index for leg, arm and body decreased at 19,4%, 16,7% and 18,2% accordingly, and Fugl-Meyer assessment scale also increased at 8,2%. To estimate the effect of Lokomat training on lower

limb synergy was measured angle, range and angular velocity in 3 planes of hip, knee and ankle joints on paretic limb. Used in our research coefficient of correlation between different joint movement, phase trajectory and goniometry allow to measure lower limb synergy. The lower numbers of coefficient corresponds to more intensive synergy. In group with flexion synergy coefficient of knee/hip synergy increased at 22,28% and decreased at 8,66% for hip flexion/abduction synergy. In group of patients with extension synergy coefficients increased at 43,23% and 17,17% for knee/hip synergy and for flexion/abduction synergy accordingly. **Conclusion.** Robotic system "Lokomat" has positive effect on general gait characteristics and intensity of pathological lower-limb synergy.

Early rehabilitation in patients with humerus fracture followed by radial nerve palsy

S. Stojicic-Djulich¹, A. Lesic², S. Zagorac², R. Kronic-Protic¹, V. Vesovic-Potic¹

¹*Clinic of Physical medicine and rehabilitation- Clinical Center of Serbia*

²*Clinic of Orthopaedic surgery and Traumatology- Clinical Center of Serbia*

Introduction. Humerus fracture are followed by radial nerve palsy in 2-12%. Radial nerve palsy in the arm most commonly is caused by fracture of the humerus, especially in the middle third or at the junction of the middle and distal thirds. This palsy may occur acutely at the time of the injury, secondary to fracture manipulation, or from a healing callus. **Aim.** The aim of this study is to show the results of early rehabilitation in patients with humerus fracture followed by radial nerve palsy. **Materials and methods.** In this prospective study we have followed 20 patients who were treated nonoperatively. Patients with „Saturday-night palsy“ were excluded. By all patients we performed the methods of early rehabilitation (electrotherapy). We recorded the time of recovery, degree of muscle recovery and intensity of pain. The results were evaluated by descriptive studies. **Results.** Fracture are caused in 12 patients by falling from the own height, in 6 patients by traffic accident and in two patients by direct force in the humerus region (shot gun). We recorded the first signs of recovery after 7-8 weeks by all patients. After 4 months by 17 patients came to full recovery of radial nerve. By two patients we didn't achieved the full recovery. **Conclusion.** By humerus fracture with radial nerve damage we strongly suggest to start with early rehabilitation methods which means correct position of the arm, passive and active exercises. If nerve function does not return in 3-4 months, then nerve should be surgically explored.

Early and late development of heterotopic ossification in traumatic spinal cord injury: a case series

R. Edith Heriseanu, G. Weber

Moorong Spinal Unit, Royal Rehabilitation Centre Sydney, Ryde, NSW, Australia

Introduction. Heterotopic ossification (HO) is a disorder of unknown aetiology characterized by bone formation in the mesenchymal tissues, possibly due to trauma, manipulations and severe spasticity. Its incidence in traumatic spinal cord injury (SCI) is estimated between 10-55% depending on study design, methods of detection and diagnosis criteria. The diagnosis of this condition is mainly clinical, but needs to be supported by pathology tests: alkaline phosphatase (ALP) (marker for osteoblast activity), serum phosphate, and imaging: three phase Technetium bone scan and X-ray. The pharmacological treatment of HO is still controversial. The currently recommended medications are: disodium etidronate and indomethacin. **Materials and methods.** This paper presents four cases of HO following traumatic SCI, two with early and two with late onset of the condition. All subjects were young males who had sustained a traumatic SCI, resulting in paraplegia (three cases) and tetraplegia (in one). Two subjects were diagnosed with HO during their inpatient rehabilitation, based on the clinical presentation, laboratory findings and triple phase bone scans and the other two were diagnosed three years after the initial insult. All were treated as per current recommendations. **Results.** A positive therapeutic response was noted only in the two patients with late onset of the condition. This was documented clinically and by pathology and imaging results. **Conclusion.** Two of the four subjects had only been treated with Disodium Etidronate, as they could not initially tolerate Indocid.

Indocid was started in these cases later, with significant improvement in clinical symptoms (mainly pain and leg oedema). New directions for prevention and treatment need to be considered and international consensus guidelines will need to be developed to better deal with this condition.

References

1. Luc Vanden Bossche and Guy Vanderstraeten. Heterotopic ossification: a review. *J Rehabil Med.* 2005;37:129-136.
2. McCarthy EF, Sundaram M. Heterotopic ossification: a review. *Skeletal radiol.* 2005;34:609-619
3. Van Kuijk AA. Neurogenic heterotopic ossification in spinal cord injury. *Spinal cord.* 2002;40:313-326.
4. Crawford CM et al. Heterotopic ossification: are range of motion exercises contraindicated? *J of Burn Care and Rehabil.* 1986;7(4):323-323

Measurement of facial movements with Photoshop software

A. Pourmomeny, H. Aseiaei, M. Meirshamsi .S. Amier-rajab
Department of physical therapy, Isfahan University of Medical Science, Isfahan University, Iran

Introduction. Evaluation of Facial function for the treatment of facial nerve palsy is recommended. Medical or physical Treatments need an objective evaluation during these procedures. Several methods have been developed, however, most of them are not objective and continuous. Photoshop software performs an objective assessment, if the movements in both sides were symmetric. To understand symmetry of movement and linear displacement in the face, we studied facial function by the Photoshop software and compared landmark's face during movements. **Material and methods.** In a descriptive-analytic study, sixty normal subjects (30 women and 30 men) were photographed. Some displacement and movements were measured by using a software Photoshop. Data collection and analysis was performed by SPSS software. **Results.** The mean displacement of forehead wrinkle in right and left sides were 10.6 and 10.1 mm. respectively. The mean displacement of landmarks on cheek in right and left sides were 9.4 and 9.7 mm, respectively. The mean displacement of oral commissure in right and left sides during smile were 11.8 mm and 11.5 mm, respectively. Comparing results, there was no significant difference between both sides ($P>0.05$). The mean distance between Landmarks (lateral canthus, oral commissure and Cheek) and axis of face were compared. The results showed that both sides were symmetric **Conclusion.** The Photoshop software with the face's landmarks may be useful for assessing facial nerve palsy and evaluates synkinesis objectively

The relationships between clinical and functional parameters in rehabilitation of young people with patellofemoral pain syndrome

R. Trăistaru, R. Popescu, D. Matei, O. Rogoveanu
University of Medicine and Pharmacy, Craiova, Romania

Introduction. The factors associated with knee pain are various, and their interactions are complicated (1). Because knee pain deteriorates the life quality for young people with patellofemoral pain syndrome (PFPS), we examined their relationships between the experiences of knee pain and the muscle volumes of the thigh (quadriceps muscle sonographic dimensions). **Materials and methods.** 36 patients, aged between 20-25 years participating in an isometric exercise program. All patients performed the 3 week outpatient rehabilitation program ("hygienic" rules of knee, pharmacotherapy, electrotherapy – TENS, ultrasound, physical training – massage, kinetic program – based on the isometric contraction), after functional analysis. Each patient was asked to score pain intensity on a 10 point visual analogue scale (VAS) and to fill the adapted Sickness Impact Profile (SIP) at entry into the study (Time 1) and after 6 weeks (Time 2). The total score of adapted SIP ranges from 0 to 28 (higher scores indicate a greater impact on health changes on daily life). **Results.** We used logistic regression analyses adjusted for age and gender. The decrease of anterior femoral muscle volume was significantly associated with knee pain ($p=0.025$). The mean scores of VAS and SIP at Time 2 were better than the mean scores at Time 1. Our results suggest that training for strengthening the quadriceps femoris muscle for people with knee pain may be effective in reducing the frequency and intensity of the pain. **Conclusion.** Rehabilitation program is the best method for maintain and correct the performance of patello-femoral compartment for knee functionality.

Physical methods have a significant benefit for short time. Kinetotherapy is the best controller "medication" for musculoskeletal structures.

References

1. Piva SR et.al. "Predictors of pain and function outcome after rehabilitation in patients with patellofemoral pain syndrome". *J Rehabil Med.* 2009; 41(8):604-12.

Pulmonary rehabilitation and alpha 1 antitrypsin level in chronic asthmatic patients

R. Trăistaru, D. Matei, R. Popescu
University of Medicine and Pharmacy, Craiova

Introduction. The main goals of pulmonary rehabilitation in BA are to maximize the functions of daily living and the learning of skills, to enhance QoL (1). The aim of the present study was to analyze the impact of the AAT deficiency on the exercise performance (express through 6MWD value – distance walking in 6 minutes) and on the clinical and functional parameters followed during rehabilitation program (RP) - biographic data (age, sex, profession), severity and type of BA, the severity of dyspnea (Borg scale score) and index of QoL (Asthma Quality of Life Questionnaire - AQLQ). **Materials and methods.** Clinical evaluation, spirometric tests, level of AAT, 6MWD and AQLQ were performed in 64 asthmatic patients (30 females, 34 males). We calculated a severity score, adapted through Blanc P.D. Subjects were evaluated before and after the 8 week pulmonary RP (monitoring pharmacotherapy, educational sessions, exercise and respiratory muscle training, psychological support). **Results.** Normal AAT level patients had better value of 6 MWD and AQLQ score, before and after pulmonary rehabilitation. We established correlations between AQLQ and 6 MWD ($r^2 = 0.56$; 95% CI = 0,42 - 0,71), after rehabilitation program. We found no correlation between the mean value of AAT and biographic data. The mean value of AAT was correlated with incidence of BA in patient grandparents ($p < 0,002$ Chi-square test). We established a significant correlation between AAT level and severity score - $r^2 = -0,16$; 95%CI = [-0,27; -0,03]. **Conclusion.** The chronic BA patients with AAT deficiency develop irreversible airway obstruction more rapid than patients with normal level of AAT. Level of AAT in asthmatic patients reflects into results of pulmonary rehabilitation, especially for exercise tolerance and quality of life.

References

1. Erwin Gelfand, *Advances in Therapy for Adults Asthma*, Clinical Cornerstone. 2007;8 [4], 62-75.

Lower Motor Neurons Loss in Cervical Myotomes in Amyotrophic Lateral Sclerosis

S. Pinto¹, M. de Carvalho^{1,2}
¹*Institute of Molecular Medicine, Faculty of Medicine, University of Lisbon, Portugal*
²*Neuroscience Department. Hospital de Santa Maria. Lisbon, Portugal*

Introduction. Amyotrophic Lateral Sclerosis (ALS) is a neurodegenerative disease characterized by asymmetric limb presentation^{1,2}, persistently more severe in the region of onset². Progression of the lower motor neuron (LMN) lesion follows a continuous radial spread^{1,2}. In addition, specific motor cells vulnerability as been theorized^{1,3}. We aimed to record motor responses from diaphragm, abductor digiti mimi (ADM) and deltoid, to test correlation of LMN loss between different muscles of the cervical region. **Materials and methods.** We included 67 ALS patients, 17 with bulbar, 27 with upper limb (UL) and 23 with lower limb (LL)-onset. We obtained motor responses from diaphragm, deltoid and abductor digiti mimi, bilaterally. Peak-to-peak amplitude, negative peak-area, latency and negative peak duration were evaluated. **Results.** Phrenic nerve responses were symmetric and highly correlated in all groups, not correlated with deltoid or ADM amplitude. In bulbar-onset patients, UL proximal and distal segments are affected symmetrically. In UL-onset patients, the ADM is smaller in the first affected side, but with no inter-side difference for deltoid. In LL-onset patients, there are no differences between sides for both UL muscles investigated, although the inter-side correlations are not significant for ADM. In bulbar and LL-onset patients, ADM amplitude correlated with deltoid. However, in UL-onset patients this last correlation was non-significant for both sides. **Conclusion.** Phrenic nerve motor neurons seem

to have a particular susceptibility for microenvironmental toxic factors involved in local propagation of LMN degeneration. Thus, it is fundamental to evaluate respiratory function at first evaluation and on follow-up.

References

1. Swash M. Vulnerability of lower brachial myotomes in motor neurone disease: a clinical and single fibre EMG study. *J Neurol Sci*1980;47:59-68.
2. Ravits J et al. Implications of ALS focality: rostral-caudal distribution of lower motor neuron loss post-mortem. *Neurology*2007a;68:1576-82.
3. Ravits JM, La Spada AR. ALS motor phenotype heterogeneity, focality and spread: deconstructing motor neuron degeneration. *Neurology*2009;73:805-11.

The Cradle®, an enriched environment

M. Cerioli
Professional man

Introduction. One of the consequences of a brain damage is the learning disorder of the postural adjustments. The control of the body is therefore limited. The limitation is bigger when the child is required to do activities which involve the rise of the centre of body mass in comparison with the supporting basis. During the development, the child with special needs tends to use less and less often the most difficult gestures: most of his initiatives fail and the child sees his development possibilities and the activities range decrease. **Materials and methods.** In the prospective of intensive exercise aimed at postural adjustments has been created this device, the Cradle, which supplies with continuity, through a movement of very slow and wide oscillation regular variations of the position of the centre of mass of the child compared with support basis. The Cradle is a space rich in experience opportunities, complementary with the treatment; an alternative to the prolonged inactivity when the child with motor development disorder risk losing part of this development potential. **Results.** First observations of children with typical or pathological development (<http://www.riabilitazioneinfantile.com/culla.htm>) show an improvement in primary and secondary variability of postural activity. **Conclusion.** I start a study with enlistment of 10 children with pathological motor development (cerebral palsy or motor retardation in syndrome).

References

- Brogren E, Forssberg H, Hadders-Algra M. Influence of two different sitting positions on postural adjustments in children with spastic diplegia. *Dev Med Child Neurol.* 2001;43(8):534-46.
- Cerioli M. L'esercizio intensivo degli aggiustamenti posturali nel trattamento riabilitativo delle PCI. *Eur Med Phys* 2005; 41 (suppl 1 to 4): 1315-8
- Carlberg EB, Hadders-Algra M. Postural dysfunction in children with cerebral palsy: some implications for therapeutic guidance. *Neural Plast.* 2005;12(2-3):221-8; discussion 263-72.

A multilevel orthose® in neurodevelopmental perspective

M. Cerioli
Professional man

Introduction. Ankle-foot orthoses, when made to measure, improve gait length, speed, tread and physiological cost index of walking. In the eventuality of knee flexion, nevertheless, orthoses so far no permit an adequate control of alignment, and professionals have recourse to botulinum or surgery. A dynamic correction of this bad alignment is instead possible by assure an appropriate kinetic set of the orthose. **Materials and methods.** I propose a knee orthose in wich thigh grip and leg grip are connected by means that work in extension, elastically. Videos of a feminine diplegic child two years half aged permit measure knee flexion angles. On this data I have conduct a statistical investigation by test T. **Results.** This investigation show an amelioration of the knees extension that further improve by use of such orthose. **Conclusion.** Collected data show that this orthose permit an effective correction of the knee flexion and no hamper for nothing the spontaneous functional activity of the child. **Perspectives.** The disturbance of the postural adjustments learning concern the entire body but most often the lower limbs. In the intersegmental perspective I thing correct also propose a MULTILEVEL ORTHOSE® (hip, knee, ankle) strictly made to measure so that permit either alignment or postural adjustments learning.

References

- Brunner R, Meier G, Ruepp T. Comparison of a stiff and a spring-tipe ankle-foot orthosis to improve gait in spastic hemiplegic children. *Journal of pediatric orthopaedics.* 1998;18:719-726.

- Burner PA, Woollacott MH, Qualls C. Stance balance control with orthoses in a group of children with cerebral palsy. *Dev Med and Child Neurology;* 1999;41:748-757
- Sveistrup H, Woollacott M. Longitudinal development of the automatic postural response in infants. *Journal of Motor Behavior* 1996;28:58-70.

Development of the Italian Version of the Tampa Scale of Kinesiophobia for low back pain. Cross-cultural adaptation, factor analysis, reliability and validity

M. Monticone¹, I. Giorgi², P. Baiardi³, B. Rocca¹, M. Barbieri⁴, C. Bonezzi⁴

¹Physical Medicine and Rehabilitation Unit, Scientific Institute of Lissone (Milan). Care and Research Institute, Salvatore Maugeri Foundation, IRCCS.

²Unit of Psychology, Scientific Institute of Pavia, Care and Research Institute, Salvatore Maugeri Foundation, IRCCS

³Consorzio Valutazioni Biologiche e Farmacologiche, Pavia University and Scientific Institute of Pavia, Care and Research Institute, Salvatore Maugeri Foundation, IRCCS.

⁴Pain Management Unit, Scientific Institute of Pavia, Care and Research Institute, Salvatore Maugeri Foundation, IRCCS

Introduction. Background. Growing attention is devoted to standardized outcome measures to improve interventions for low back pain (LBP). A translated form of the Tampa Scale of Kinesiophobia (TSK) in patients with LBP has never been validated within the Italian population⁽¹⁾. Purpose. Translating, culturally adapting, and validating the Italian version of the TSK, allowing its use in Italian-speaking LBP patients. Design. Evaluation of the psychometric properties of a translated, culturally adapted questionnaire. Participants. Patients with subacute and chronic common LBP, an age of 25-85 years, and an ability to read and speak fluent Italian. Patients with specific causes of LBP, central or peripheral neurological signs, systemic illness, and psychiatric deficits were excluded. **Materials and methods.** The TSK-I was developed involving forward-backward translation, final review by an expert committee and testing of the pre-final version to establish its correspondence to the original English version. Psychometric testing included factor analysis, reliability by internal consistency (Cronbach's alpha) and test-retest repeatability (Intraclass Coefficient Correlation), discriminant validity by comparing TSK-I to Visual Analogue Scale, VAS, Roland Morris Disability Questionnaire, RMDQ, Beck Depression Inventory, BDI, and to Beck Anxiety Inventory, BAI (Pearson's correlation). **Results.** The Authors required a five-month period before achieving a shared version of the TSK-I. The questionnaire was administered to 178 subjects, showing satisfying acceptability. Factor analysis demonstrated a two-factor 13-item solution (38% of explained variance). The questionnaire showed good internal consistency ($\alpha=0.772$) and high test-retest reliability ($ICC=0.956$). Discriminant validity showed low correlations with VAS ($r=0.345$), RMDQ ($r=0.337$), and BDI/BAI, ($r=0.258$ and $r=283$, respectively). **Conclusion.** The TSK was successfully translated into Italian, showing good factorial structure and psychometric properties, replicating the results of existing language versions. Its use is recommended for research purposes.

References

1. Vlaeyen JW, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. *Pain.* 2000;85(3):317-32

Demyelinating polyneuropathy in a patient with ankylosing spondylitis receiving infliximab treatment

O. Özdemir¹, A. Çetin¹, E. Esen¹, S. Kiraz²

¹Hacettepe University Medical School, Department of Physical Medicine and Rehabilitation, Ankara, Turkey

²Hacettepe University Medical School, Department of Internal Medicine, Division of Rheumatology, Ankara, Turkey

Introduction. Anti tumor necrosis factor alfa (TNF- α) agents have become an established treatment for ankylosing spondylitis (AS). However, patients treated with these agents show few adverse events including central and peripheral nervous system. Here, we report a patient with a diagnosis of ankylosing spondylitis who developed sensory motor demyelinating polyneuropathy after 5 months of infliximab treatment. **Case report.** A 39-year-old woman with a diagnosis of AS complained of numbness in her both hands and feet which had begun 2 months earlier and difficulty in getting up after sitting down for the last 2 weeks. She was taking infliximab

treatment since July 2009 (5 mg/kg intravenously every 6 weeks) with a satisfactory response. Neurological examination revealed bilateral weakness in both upper and lower extremities, glove-sock type hypoesthesia, and symmetric hypoaesthetic deep tendon reflexes. Laboratory tests including complete blood count, serum biochemistry, erythrocyte sedimentation rate, C-reactive protein, Vitamin B12 and thyroid functions were all in normal ranges. Electrodiagnostic studies were consistent with sensory motor demyelinating polyneuropathy. Infliximab treatment was discontinued and she was called for controls. **Conclusion.** Close monitoring for peripheral neurological complication in patients receiving anti-TNF agents is strongly advisable.

Efficacy of botulinum toxin type a on functional impairment of degenerative hip joint: preliminary results

M. Acler⁶, C. Marchini¹, M.A. Bolognari², A. Causero², D. Volpe⁴, D. Regis⁵, A. Rizzo⁵, R. Rosa⁵, R. Eleopra³, P. Manganotti⁶

¹Neurology, City Hospital San Martino, ULSS 1 Belluno

²Department of Surgical Sciences, Institute of Orthopedic surgery, University of Udine

³Neurology, City Hospital All'Angelo di ULSS 12 Mestre-Venezia,

⁴Rehabilitation Unit, Fatebenefratelli Hospital, Venezia,

⁵Department of Orthopedic surgery, University of Verona

⁶Department of Neurological and Visual Sciences, University of Verona, Verona, Italy

Introduction. Aim of the present study was to investigate the effect of botulinum toxin type A injection into the adductor muscles in reducing pain and in improving joint mobility and quality of life in patients affected by hip osteoarthritis. **Materials and methods.** This was a prospective, open-label, not controlled, multicentre study conducted to assess the effect of the administration of BoNT-A (Dysport) on hip function, pain and quality of life in outpatients affected by HOA. Thirty-nine outpatients, mean age 68 years (range, 41–82), were evaluated using Harris Hip Score to test hip function, Visual Analogue Scale to measure pain intensity and by the SF-36 questionnaire to assess patient well-being and quality of life at baseline, 2, 4 and 12 weeks after treatment with (botulinum toxin type A). A total of 400 U of (botulinum toxin type A) (Dysport) were injected into the adductor longus muscle and into the adductor magnus muscle. **Results.** The Harris Hip Score significantly increased after 2, 4 and 12 weeks (df 3, $\chi^2=45.1$; $p<0.0001$). A significant decrease of pain intensity was detected at all the following visits after 2, 4 and 12 weeks (df 3; $\chi^2=27.8$; $p<0.001$). SF-36 score was significantly higher 4 and 12 weeks after treatment. At each evaluation visit a significant correlation between pain decrease and improved hip mobility was detected. **Conclusion.** BoNT-A induced a reduction of pain indicating this could be an innovative, less-invasive treatment in patients affected by severe hip osteoarthritis with remarkable effects on the clinical management of this disease.

References

1. Hoaglund FT, Steinbach LS. Primary osteoarthritis of the hip: etiology and epidemiology. *J Am Acad Ortho Surg* 2001;9:320-327.
2. Shrier I, Feldman DE, Gaudet MC, Rossignol M, Zukor D, Tanzer M, et al. Conservative no-pharmacological treatment options are not frequently used in the management of hip osteoarthritis. *J Sci Med Sport* 2006;9:81-86.
3. Mense S. Neurobiological basis for the use of botulinum toxin in pain therapy. *J Neurol* 2004;251(Suppl 1):II-17.

Education for physical therapy on university degree of Macedonia

E. Popova Ramova¹, S. Ristevska¹, A. Poposka²

¹Department for physical therapy University of Bitola

²Department for physical therapy University of Skopje, Medical faculty Skopje, R. Macedonia

Introduction. The physical therapy has a long old tradition in the area of South East Balcan and in my country too. There are many thermal baths. The first physical therapy health care was organized after First World War, when were many people with amputation. The education for doctors started at 1992 year at Medical faculty Skopje, the doctor association has more than 120 members now. The physiotherapist organization has more than 200 members, most of them with middle education. The aim of this study is to present our work for improving education. **Materials and methods.:** We have investigated the web sides from our four public universi-

ties, and use our own experience. The method of analyze was to compare the level of education and credits. **Results.** On four universities by three is organizing the medical study for doctors and in five year they are learning physical therapy. The specialization for physiatrists is organizing on Medical faculty in Skopje. The number of doctors compare with population, but we have deficit of physiotherapist with university level of education. The public is organizing the study for physiotherapist with 3 years basic education, 180 credits and 2 years postgraduate study master degree. **Conclusion.** The ministry of education involve the European standards for education and regulate the work in universities by them. They invest in equipment and humane resource.

A new method for assessing physical activity at home: preliminary study in COPD patients admitted to a pulmonary rehabilitation programme.

F. Giuntoli¹, M. Boni¹, L. Ieri¹, I. Gelli¹, T. Valentino², C. Quiriconi¹, L. Bertuccelli¹, S. Lange¹, E. Salotti¹, E. Tommasi¹, ML. Galardini¹, R. Lorenzini¹, N. Borrelli¹

¹Medical Rehabilitation, Hospital SS Cosma e Damiano, Pescia (PT) Italy

²Spinal Unit, AOU-Careggi, Firenze. Italy.

Introduction. Physical activity in daily life is an important predictor of risk of hospital readmission and mortality in patients with COPD. Subjective methods (questionnaires and diaries) have been used, yet they have proved less accurate than motion sensor (electronic accelerometers). We evaluate physical activity in COPD patients admitted to a pulmonary rehabilitation programme (PRP). **Materials and methods.** In total, 22 patients with COPD GOLD stage II-IV (age 73.2±7.8; BMI 28.7±5.7; FEV1 48.5±23.8) were admitted to a PRP as outpatients (2 hours twice a week). Almost all (23/24) patients used pedometer before they were recruited. During PRP, patients wore a multisensor armband for 3 days to assess physiological indicators of physical activity (steps per day; total day energy expenditure; physical activity level (PAL)). Furthermore, we evaluated exercise tolerance (6-minute-walking test (6MWT)), self-reported dyspnoea in activity daily living (Medical Research Council scale (MRC)), mental disorders (Beck Anxiety Inventory (BAD), Beck Depression Inventory (BDI)) and quality of life (SGRQ). **Results.** Data were obtained from 10 patients (drop out caused by 2 exacerbation, 5 bad use of devices, 5 failure in computer data recovery from armband). Only 2 patients were very active (PAL > 1.9), 4 active (1.6<PAL<1.9), 4 low active (PAL<1.6); only 3 patients walked less than 3000 steps per day (mean±sd pedometer 4033.2±2254.1, multisensor armband 6082.2±3188.2, correlation between them R = 0.78, $p<0.01$). Exercise tolerance (6MWT assessed at the end of PRP, 307.5±80.5) and steps per days measured by both devices showed a good correlation (R=0.71, $p<0.03$ with pedometer, R= 0.76, $p<0.02$ with armband). We found no correlation between steps per days and BAI/BDI nor steps per days and SGQR. **Conclusion.** Several methods are used to quantify physical activity in COPD. The present study, although preliminary to a much larger study in progress, seems to suggest that multisensory armband is useful to evaluate physical activity in COPD outpatients.

References

1. American Thoracic Society/European Respiratory Society Statement on Pulmonary Rehabilitation. *Am J Respir Crit Care Med* 2006;173:1390-1413.
2. Pitta F, Troosters T., Probst VS, Spruit MA, Decramer M, Gosselink R. Quantifying physical activity in daily life with questionnaires and motion sensors in COPD. *Eur Respir J* 2006;27:1040-1055
3. Watz H, Waschki B, Meyer T, Magnussen H. Physical activity in patients with COPD. *Eur Respir J* 2009;33:262-272

Maintenance of respiratory outcomes by repeated pulmonary rehabilitation: a 3-years trial

F. Giuntoli¹, M. Boni¹, L. Ieri¹, I. Gelli¹, T. Valentino², S. Lange¹, C. Quiriconi¹, L. Bertuccelli¹, E. Salotti¹, B. Corsi¹, M. Campioni¹

¹Medical Rehabilitation, Hospital SS Cosma e Damiano, Pescia (PT) Italy

²Spinal Unit, AOU-Careggi, Firenze. Italy.

Introduction. Pulmonary rehabilitation is useful to increase the functional state in COPD patients. Our aim was to evaluate the effects of repeated programmes in long-term maintenance of benefits derived from a first rehabilitation programme. **Materials and methods.** Twenty-two COPD patients (M 16, age 69.7±8.6, forced

expiratory volume in 1 s (FEV1) $49.4 \pm 23.7\%$ predicted), were yearly admitted to pulmonary rehabilitation programmes as outpatients in a period of 3 years. We observed time course of Body Mass Index (BMI), FEV1, 6-minute Walking test (6MWT), effort dyspnoea (Borg scale (BORG R) at the end of 6MWT) and dyspnea in activity of daily living through Medical Research Council scale (MRC), health-related quality of life through St. George Respiratory Questionnaire (SGRQ) and we calculated BODE index (BODE). **Results.** BMI and FEV1 remained stable over the time. In comparison with the beginning of each rehabilitation programme, we observed an improvement at the end of the same as regard 6MWT, BORG R and BODE; these results were maintained at final discharge. MRC improved only at the end of first programme, showing then a worsening at final discharge. SGRQ total score did not vary over the all period, even if single items (activity and impact) showed an improvements at the end of first programme, and symptoms' item decreased at the end of third rehabilitation programme. **Conclusion.** COPD patients who underwent repeated pulmonary rehabilitation programmes maintained benefits obtained from first programme in terms of exercise tolerance, effort dyspnoea, health related quality of life and prognostic BODE index along a period of 3 years.

References

1. Pauwels RA, Buist AS, Calverley PM, Jenkins CR, Hurd SS. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. NHLBI/WHO global initiative for chronic obstructive lung disease (GOLD) workshop summary. *Am J Respir Crit Care Med*, 2001;163:1256-76.
2. Foglio K, Bianchi L, Bruletti G, Porta R, Vitacca M, Balbi B, Ambrosino N. Seven year time-course of lung function, symptoms, health-related quality of life, and exercise tolerance in COPD patients undergoing pulmonary rehabilitation programs. *Respir Med*, 2007;101:1961-1970.
3. Ries AL, Kaplan RM, Myers Maintenance after pulmonary rehabilitation in chronic lung disease: a randomized trial. *Am J Respir Crit Care Med* 2003 Mar 15;167 (6):880-8.

Hand osteoarthritis: relationship between radiological changes, strength and disability

S. Canpolat, P. Borman, E. Ceceli, M. Okumus

Ankara Training and Research Hospital Clinic of I. Physical Medicine and Rehabilitation, Ulucanlar, Ankara, Turkey

Background and purpose. Hand osteoarthritis (OA) is one of the most common joint disorder, having an impact on grip strength and leading to functional disability. The aim of this study was to assess the grip and pinch strength and to evaluate the relationship between radiological scores, hand strength and functional disability of the hand. **Materials and methods.** Sixty patients with hand OA and 40 healthy control subjects with a mean age of 56.6 and 58.9 years respectively, were recruited to the study. Range of motion of the hand joints were determined. The intensity of pain was assessed by VAS, functional disability was assessed by DASH questionnaire. Grip strength and pinch strength were evaluated using standard procedures. The x-ray of the hands were classified according to Kalman method. The relationship between the radiological, clinical and functional scores were recorded. **Results.** All the subjects were female. The demographic variables were similar between the patient and control groups. The pain intensity was higher in patient group than in the control group, while the mean grip strength, ROM values and DASH scores were similar between the groups. Pinch strength were found to be decreased in the patient group. There was a relationship between radiological scores and pinch strength and DASH scores ($p < 0.05$). **Conclusion.** The degenerative changes in osteoarthritic hands have a negative impact on daily living activities and impairs hand function. Radiological progression affects the strength and functional performance. The assessment of pinch strength seems to be useful for determining the functional disability. From this view, we suggest strengthening exercises and rehabilitation approaches in order to increase the quality of life of the patients suffering from hand osteoarthritis.

Rehabilitation in Ankylosing Spondylitis: a casuistic contribution

F. Giannetto, G. Scavo, D. Sambataro, C. Mazzone, G. Rinaldi

Aim. In the present study were valued the effects (medium and short time) on functionality and mobility of a rehabilitation protocol in patients with AS in drug treatment for at least 4 months. **Materials**

and methods. The presented case studies include 20 males and female, aged between 30 and 60, with ankylosing spondylitis according to revised criteria of New York and stabilized on medication (NSAIDs, MTX, biological) at least 16 weeks. Evaluation of physiatric items were: VAS, morning stiffness (minutes), thoracic expansibility (cm), test Schöber (cm), finger-floor distance (cm), occiput-wall (cm), spinal mobility (degrees), ROM peripheral joints. Scale of disability equipment: FIM, BASFI, BASDAI. The treatments offered were: cognitive-behavioral education, RPG, stretching and breathing exercises. It was applied with a rate biweekly cycles of 20 sessions (8 weeks) repeated 3 times in a year, supplemented by a home program of exercises performed. **Results.** The adopted protocol was shown to improve all the parameters of valuation used. **Conclusion.** The rehabilitation activities applied on patients pharmacologically stabilized has been proven to reduce pain and depression, and improve joint mobility and independence in ADL.

References

1. Dougados M, van der Linden S, Juhlin R, et al. The European Spondylarthropathy study Group preliminary criteria for the classification of spondylarthropathy. *Arthritis Rheum* 1991;34, 1218-27.2.
2. van der Linden S, Valkenburg HA, Cats A. Evaluation of diagnostic criteria for ankylosing spondylitis. *Arthritis Rheum* 1984;27:361-368.
3. Revel M, Poiraudeau S, Lefevre-Colau MM, Ghanem N, Mavoux-Benhamou MA, Fougereux M, Moreau S, Rozo JJ. La rieducazioe nella pelvi-spondilite reumatica. *Enyl Méd Chir (Elsevier Paris)*, *Medicina Riabilitativa*, 26-291-A10, 2003, 12p.
4. Souchard PH. Rééducation posturale globale: les chaînes musculaires et leurs postures. *Kinésithérapie Scientifique* 1987;256:46-54.

Identifying characteristics of geriatric patients that referred to outpatient clinics of Physical Medicine and Rehabilitation: A report of multicenter nationwide study

P. Borman, M. Okumus, E. Ceceli, A. Dogan, Y. Gokce-Kutsal

Geriatric Rehabilitation Group of Turkish Society of PMR, Turkey

Background and purpose. The admission of elderly to physical medicine and rehabilitation (PMR) clinics has been growing in the recent years. The aim of the study was to identify demographic and clinical characteristics of geriatric patients referring to outpatient clinics of PMR. **Materials and methods.** Eight hundred and twenty patients with a mean age of 73.3 ± 3.7 years were reviewed from 20 different PMR department in Turkey. The demographic characteristics including age, sex, marital status, education, living status, as well as clinical variables comprising medication, cause of admission, activity status, falls and comorbid diseases were recorded. **Results.** 69.6% of our patients were female and 30.4% were male. 67.7% of patients were married and 83.1% of them were living with their families, 14.4% were living alone. 38.5% of the elderly were illiterate. All patients had at least one comorbid disease, hypertension as the most common. 86% of the patients had more than one comorbid diseases. The most common causes of admission were degenerative osteoarthritis, disc lesion, rotator cuff tendinitis, and stroke respectively. The most common complaint at admission was joint pain followed by fatigue and tiredness. 33.7% of patients had sleep disorder. 42.4% patients had osteoporosis, 16.5% had experienced at least one fall during last year. 15% of patients were performing regular exercises at home, most of them were walking routinely and performing praying activities. The mean number of pills taken by the elderly was 3.8 ± 2.1 . **Conclusion.** Population is ageing, geriatric percentage of outpatient practice of PMR clinics will be continuously increasing. Our geriatric population mostly were living with their families and had lower levels of education and less percentage of them were performing regular exercise. Also polypharmacy was common in our subjects. It is important to be aware of comorbid diseases, falls and drugs in planning the rehabilitation of these geriatric patients. Also for a better quality of life, exercise habits of the elderly should be improved.

Assistive technology: a challenge towards independence

F. Tebaldi, F. Scarpetta

Centro Efesto, Centro per l'autonomia delle persone disabili, Loreggia (PD)

Introduction. Assistive technology (AT) aims at improving and maintaining independence of disabled people. (Fhurer et al., 2003). To claim for such a result, independence should be measured in an

early phase of the adoption of AT and after a period of use. Among the possible intervening factors which could modify independence level over time, the disease progression has never been considered. In the present study AT's efficacy on different aspects of disabled people's life has been tested. Then, stability of independence reached through the use of AT over time has been investigated.

Materials and methods. Participants were 92 patients (age 6-70 years) and affected by visual, motor or communication impairment. Self-reported measures were collected at the end of the training to the use of the assigned AT and after 12 months. **Results.** Even though participants were generally satisfied with the assigned AT after a period of use (56% of patients reached the initial goals; 84% considered satisfactory the assigned AT, 60% reported to use the AT on a daily basis), independence reached through technology decreased over time (94% of patients reporting to be more autonomous after the training versus 76% of patients after a year). Interestingly, correlations computed between independence and disease progression (a potentially critical factor), showed that disease degeneration leads to acquire more independence through AT ($p=0.001$). **Conclusion.** This study points out the efficacy of AT in daily activities and independence of people with disability. In particular, AT can support independence of people with degenerative disease, adapting to the increased complexity characterizing these situations. Future research is needed to clarify factors modulating AT effect on independence between short and long term use.

References

Fhurer, MJ, Jutai, JW, Schreier, MJ, Deruyter, F. A framework for the conceptual modelling of assistive technology device outcomes. *Disability and Rehabilitation*, 2003;25(22):1243-1251.

Gait analysis and Winter's classification of hemiplegic children

A. Nascimbeni¹, A. Gaffuri¹, M. Rigano², C. Foglia¹, S. Ghiringhello¹, F. Sabatini¹

¹Gait Laboratory, Rehabilitation Unit Osp. S. Croce Moncalieri.
²Postgraduate School of Rehabilitation Medicine, Turin University

Introduction. The Winters' kinematic gait classification of hemiplegic children is widely used. The aim of this study is to investigate gait spatio-temporal parameters and gait asymmetry among groups. **Materials and methods.** The clinical and gait analysis data of 31 hemiplegic cerebral palsied children were reviewed out of the database gait laboratory. The inclusion criteria were: age lower than 18, no surgery or botuline toxin injection in the last 6 months before the analysis, no legs length differences more than 1,5 cm. 23 patients (age 8,7±28) were selected and classified by reviewing videorecordings and kinematic data. 8 were classified in class I, 12 in II, 3 in III and 0 in IV. Classes I and II were considered for further analysis. A control group of 12 children (age 8,4±1,5) was also studied. The parameters analyzed were: height normalized speed (S), stride time (ST), SD of ST(SD), cadence (C), double support (DS), swing ratio (SWr) and single support ratio (SSr). Kruskal-Wallis (KW) test and post-hoc tests when needed, were employed for statistical analysis with $\alpha=0,05$. **Results.** **S:** I=0,71±0,06, II=0,76±0,17, controls=0,94±0,16. KW $p=0,007$, I<controls*, II<controls* **ST:** I=1,1±0,11, II=1,03±0,13, controls=1±0,08. KW $p=0,08$. **SD:** I=0,05±0,02, II=0,06±0,03, controls=0,03±0,01. KW $p=0,04$, II>controls*. **C:** I=55±5,2, II=59,8±8,2, controls=61,2±4,7. KW $p=0,09$. **DS:** I=26,8±4,9, II=30,6±5,2, controls=18,2±4,6. KW $p=0,0001$, I>controls*, II>controls*. **SWr:** I=1,14±0,13, II=1,12±0,13, controls=0,98±0,05. KW $p=0,004$, I<controls*, II<controls*. **SSr:** I=0,89±1, II=0,88±0,09, controls=1,02±0,04, KW $p=0,003$, I<controls*, II<controls*. ($p<0,05$). **Conclusion.** Significant differences were not found between classes I and II, even if the last group showed larger C, SD, DS, SWr and smaller ST, SSr, suggesting more unbalance and gait asymmetry. Larger samples are needed to further differentiate the groups.

New technologies to measure hoarseness (Dysphonia) recovery following phonological rehabilitation in a patient with central hemi-laryngeal palsy

R. Semprini, G. Albertini, M. Franceschini, E. Palma, A. Pierallini, M. Mignano
IRCCS San Raffaele Pisana, Roma

Introduction. Diagnosis and treatment of the hypomobile vocal cord are challenging for clinicians. Video-telemetry and spectroscopy and

vocal spectrographic analysis are diagnostic tools useful in clinic for diagnostic proposals. However, these techniques may be useful also to measure with major precision both the laryngeal and vocal function in patients during rehabilitative programme. Aim of this study is to qualify these techniques in a case of central laryngeal palsy. In particular, we propose the use of these tools for clinical evaluation of the laryngeal and vocal functions along the whole duration of rehabilitative programme. **Materials and methods.** A 56 years old male, suffered from bulbar ischemic stroke. He presented with hemilaryngeal, and vocal cord palsy. Video-telemetry and spectroscopy and vocal cord spectrographic analysis were performed before he started phonological treatment and at the end. For our scopes we used digital telemetry Kay-Pentax, computed-assisted vocal spectrograph CSL 5400 Kay-Pentax, MDVP multidimensional voice program Kay-Pentax software. **Results.** Both tele-video and vocal cord spectrographic analysis showed that phonological therapy ameliorated cord adduction and vocal cord mobility, and as a consequence hoarseness. **Conclusion.** This case represents the first case in which new computed assisted technologies were used as tools for quantification of clinical recovery of laryngeal palsy. This in general might represent a new strategy for evaluation of laryngeal paralysis due to either pharmacological or rehabilitative treatment.

References

Tucker HM. Laryngeal paralysis: etiology and management In: English GM ed. *Otolaryngology* (cap. 45). Philadelphia: Harper& Row Publ 1983
Behrman A. Evidence-based treatment of paralytic dysphonia: making sense of outcomes and efficacy data. *Otolaryngol Clin North Am*. 2004 Feb;37(1):75-104, vi.

Writing a booklet for patients about Complex Regional Pain Syndrom (CRPS1): relevance and satisfaction of professionals and patients

C. Favre, O. Deriaz, M. Konzelmann, J. Savoy, F. Luthi

Clinique romande de réadaptation (SuvaCare), Sion, Switzerland

Introduction. Linked to its duration and its unpredictable character, Complex Regional Pain Syndrom (CRPS1) affects the quality of life and could induce worries. Thus, explanations on this syndrome are essential in order to reassure the patient and help him to cope with it. To our knowledge, descriptive booklets about CRPS1 for patients are rare. This research assesses the relevance and quality of a booklet we wrote based on our clinical experience and literature. **Materials and methods.** The booklet and a questionnaire "your opinion on the booklet" were distributed to professionals of the multidisciplinary team of a rehabilitation hospital (physicians, physiotherapists, occupational therapists) as well as to patients with CRPS1. **Results.** 41 professionals and 40 patients evaluate the information given (with a visual analogue scale) in the booklet as very satisfying (respectively 80,36, 80,93) and very useful (82,7, 80,36). Satisfaction is significantly higher for physicians ($p=0,016$) compared to therapists and for those, physicians or therapists, who have more experience with CRPS1 ($p=0,03$). For both groups the booklet "completely" describes what the patient feels (73%, 62%) and "completely" answers the questions the patient may have (59%, 43%). Patients more than professionals appreciate the way the information is presented ($p=0,008$) and professionals find more ideas about what is the best to do ($p=0,025$). Seventy-three % of patients feel reassured after reading the booklet. On open questions, patients insist on having more information on prevention and psychological impacts. **Conclusion.** This first version of a booklet addressed to patients with CRPS1 is well evaluated by professionals and patients in rehabilitation. Patients appreciate the way it is presented, professionals, especially physicians, find it very satisfying. We wrote then the final version which takes into account the different comments and we project now to investigate the usefulness of this standardised booklet.

Care-related pain in a rehabilitation hospital: how patients' and professionals' perceive it?

C. Favre, R. Hanon, O. Deriaz, F. Luthi

Clinique romande de réadaptation (SuvaCare), Sion, Switzerland

Introduction. Care-related pain (CRP) is generally under-estimated and rarely studied in rehabilitation as well as in general medicine. This exploratory study aims to understand patients' and professionals' subjective perceptions and beliefs about CRP and about the ways of coping or preventing it. **Materials and methods.**

Questionnaires about CRP were submitted to 75 members of the interdisciplinary team of a rehabilitation hospital (physicians, physiotherapists, occupational therapists and nurses) and to 50 patients. Twenty patients were also interviewed. Four topics were addressed: 1. frequency and experience of CRP 2. painful procedures and situations, 3. beliefs and understanding of CRP 4. ways and techniques to help the patient or to cope with CRP. **Results.** Almost all members of the team recognised CRP as a problem for their practice and half of patients said having sometimes experienced CRP. Mobilisation, gait and clinical examinations are very often seen as painful both for groups. Differences between patients and professionals exist: Patients more than professionals see CRP as normal ($p < .0266$), useful ($p < .0375$) and necessary ($p < .00003$). Professionals more than patients underline the possible risks related to CRP. For both groups, beliefs about CRP include notions of progress and step. Regarding the ways of dealing with CRP, professionals insist on the importance of explanations and of collaboration and agree on the techniques to alleviate pain. Patients perceive quite well the numerous ways used by physiotherapists to help them, they underline pacing activity and explanations. **Conclusion.** This first study in the field of rehabilitation medicine shows that CRP is a common and unavoidable problem in clinical practice. Patients and professionals consider CRP as part of the recovery process and acceptable at least until a certain level. Nevertheless, perception of CRP seems to be more complex and these results could suggest ways for improving our clinical practice.

References

Coutaux A et al. Care related pain in hospitalized patients : a cross-sectional study. *Eur J Pain* 12, 3-8, 2008

Scoliosis and body schema disorders: an experimental study in 48 patients with adolescent idiopathic scoliosis.

A. Picelli¹, S. Negrini², A. Zenorini¹, F. Zaina², S. Mion³, N. Smania^{1,3}

¹Neuromotor and Cognitive Rehabilitation Research Centre, Department of Neurological and Visual Sciences, University of Verona, Italy.

²ISICO (Italian Scientific Spine Institute), Milan, Italy

³Rehabilitation Unit, "G.B. Rossi" University Hospital, Verona, Italy

Introduction. Adolescent idiopathic scoliosis (AIS) has a composite aetiology, involving factors as defective central nervous system control of body posture, alteration of the body schema, anomalous interactions between hormones involved in the growth processes, genetic determined collagen and skeletal musculoskeletal abnormalities and biomechanical disturbances.¹ Aim of this study is to determine the presence of an alteration of the body schema in patients with AIS. **Materials and methods.** 48 patients (mean age 13,8 years) with AIS were recruited. We collected data about age, sex, stature, weight, handedness, age at menarche or at pubertal voice changing, family history of scoliosis, back pain, sport practice, asymmetry of the trunk and deviation of the line of spinal apophyses.² Surface measurements of the sagittal curves of the spine (by means of inclinometer) and of the hump at the Adam's test (by means of Scoliometer and hump-meter) were performed.² Data about the Cobb's angle, the Risser sign and rehabilitation treatment were also collected.² We evaluated each patient's postural assessment perception by means of a graphic board reporting several imagines of spines with scoliosis by asking to indicate the image representing their own spine. **Results.** Patients with AIS showed to significantly underestimate their primary curve. Family history of scoliosis and asymmetry of the shoulders showed a positive correlation with the curve estimation error. Moreover age, Risser sign and rehabilitative treatment duration showed a negative correlation. **Conclusion.** Patients with AIS showed to have a defectively awareness of their anomalous postural condition, reporting an underestimation of their deformity. Postural awareness become more precise with growth and rehabilitative treatment.

References

1. Smania N, et al. Neurophysiological basis of rehabilitation of adolescent idiopathic scoliosis. *Disabil Rehabil.* 2008;30:763-71.
2. Negrini S, et al. Italian guidelines on rehabilitation treatment of adolescents with scoliosis or other spinal deformities. *Eura Medicophys* 2005;41:183-201.

Comparison of rehabilitation delivery and mobility outcome following lower limb amputation in centres in three European countries: a step towards developing standardised healthcare outcomes

K. Sansam¹, V. Neumann¹, N.H. Ryall², R. J. O'Connor¹, B. Bhakta¹, G.M. Rommers³

¹Academic Department of Rehabilitation Medicine, University of Leeds, UK

²National Rehabilitation Hospital, Dublin, Ireland

³Center for Rehabilitation, University Medical Center, University of Groningen, The Netherlands

Introduction. The provision of rehabilitation services for people after major lower limb amputation in Europe varies between centres and as yet there has been no published data comparing outcomes resulting from different service models. We have investigated mobility outcomes in people accessing amputee rehabilitation services at centres based in three different European countries and describe the different service models provided in each centre. This will be a first step in developing processes to facilitate sharing best practice, standardising core healthcare outcomes and service evaluation for amputee rehabilitation across Europe. **Materials and methods.** Adult patients treated in three European amputee rehabilitation services based in UK, the Netherlands and Ireland during the same six month time period were identified retrospectively. Patient characteristics, length of inpatient treatment and mobility status measured by the SIGAM and SIGAM/WAP mobility scales on discharge or outpatient follow-up in the first year were captured from patient records. **Results.** Data on a total of 161 patients were collected and analysed. The patient populations at each centre were similar with respect to age and cause of amputation. The percentage of transtibial amputees was highest in the Netherlands (53%) which also had the longest average length of admission (90 days). All patients deemed unsuitable for a functional prosthesis had dysvascularity as the cause of their amputation and in general had more proximal or bilateral amputation levels. The proportion of patients achieving independent walking (SIGAM grades C-F) was lowest in the UK (65%), reflecting the high rate of patients not provided with a functional prosthesis at this centre (16%). **Conclusion.** In order to facilitate further evaluation of outcomes and sharing of best practice in European amputee rehabilitation services, we suggest the development of internationally comparable datasets with a case mix adjuster to compensate for differences in patient populations.

Benefits on fatigue, spasticity perception and quality of life determined by Therapeutic Exercise in Hypogravity Environment in patients with mild to moderate Multiple Sclerosis: a prospective randomized pilot study

E. Magni, C. Ljoka, G. Della Bella, C. Foti FP

Tor Vergata University in Rome, Physical and Rehabilitation Medicine, Department of Public Health, via Montpellier 1, 00133, Rome, Italy

Introduction. *Therapeutic Exercise In Hypogravity Environment* (TEHE) has been increasingly promoted in rehabilitation of patients with MS (pwMS), thanks to the water properties of making possible to exercise in a global way while minimizing the problem of thermosensitivity. Although there is good clinical evidence for TEHE benefits, only a limited number of trials exists and the optimal plans of treatment are still to be determined. The aim of this study was to assess whether an Intensive program (high frequency – short duration) may lead additional benefits to pwMS on fatigue, perception of spasticity, quality of life, compared to a Standard program (low frequency – long duration). **Materials and methods.** In the period between May 2008 to May 2009 twenty-four consecutive MS patients, meeting specific inclusion criteria, were enrolled in the PM&R Department of Tor Vergata Hospital and randomly assigned to two groups: the first performing an Intensive program (five sessions a week for two weeks) and the second a Standard program (two sessions a week for eight weeks) of TEHE. Subjects were assessed through appropriate rating scales at the beginning and at the end of the exercise cycle. **Results.** The Pre-Post analyses of the results from both the groups showed reduction in fatigue and spasticity perception and improvement in quality of life, but the Standard program group only showed statistically significant changes ($p < .05$). **Con-clusion.** The results suggest that TEHE conducted in an Intensive mode does not produce additional benefits in pwMS compared to the Standard low frequency-long duration mode. Further studies are to be conducted to identify the most favourable plans of TEHE for pwMS.

References

De la Hoz R. Rehabilitation Recommendations for Persons with Multiple Sclerosis. US Neurological Disease 2007 – Issue I, October 2008.
White LJ, Dressendorf R. Exercise and Multiple Sclerosis. Sports Medicine 2004;34(15) 1077-1100.

Patient characteristics influencing rehabilitation outcome post osteoporotic fractures

M. Trócsányi, G. Fazekas, K. Dobai
Szent János Hospital, Budapest, Hungary

Introduction. Osteoporosis has become a significant problem in the last decades as the number of osteoporotic cases increases with the age. The aim of this study is to investigate the types and severity of permanent disability in patients suffering from osteoporotic fractures. **Materials and methods.** As a retrospective study, the case histories of all patients with osteoporotic fractures at the Department of PRM of a general hospital in a five-year-long period were included in the study (Szent János Hospital, Budapest 01/01/2004 – 31/12/2009). The data were analysed for disability and osteoporosis prevention with descriptive statistical methods. Fractures occurred without any big power were considered as osteoporotic ones. Anamnestic data were examined in respect of other osteoporotic fractures, diseases and drugs leading to osteoporosis. From the point of view of rehabilitation data of the FIM and Barthel's index before and after the rehabilitation and also the ICF-codes were collected of these patients. **Results.** During the analysed five years 1904 patients took part at rehabilitation programme, 670 of them had altogether 739 osteoporotic fractures. The most frequent disabilities were according to the ICF: b710 and b715 (mobility and stability of joint functions), b730 and b740 (muscle power and endurance functions), d230 (carrying out daily routine). 161 (24%) of all patients had osteoporotic fracture before. 203 (30%) suffered from a disease, and 11% of them took a drug, which may cause osteoporosis. Only 11% of all patients took drugs for prevention, but few of them had a relevant combination. **Conclusion.** Although, the rehabilitation outcome after fractures is usually good, the quality of life often becomes worse. Patients after a fracture have to be in the front of the prevention, because after a second fracture the chance is much lower for an independent life.

The Change of the Radiographic Measurements and the Pain in Patients With Patellofemoral Pain Syndrome After Therapeutic Exercise Program

Dug-Young Kim¹, Kil-Byung Lim¹, Tae-Ho Jung², Young-Sup Kim¹
¹Department of Rehabilitation Medicine,
²Sports Medical Center, Inje University, College of Medicine, Ilsanpaik Hospital

Introduction. To investigate the change and association of the radiographic measurements and the pain in patients with patellofemoral pain syndrome after therapeutic exercise program. **Materials and methods.** Twenty patients with knee pain diagnosed with patellofemoral pain syndrome were recruited and randomly divided into two groups. The exercise group was trained with the stretching exercise (hamstring muscle, gastrocnemius muscle, soleus muscle, quadriceps femoris muscle, iliotibial band) and the strengthening exercise (vastus medialis obliquus muscle, iliacus muscle) for 1 hour/day during 4 weeks. The control group was not trained special exercise program. Visual analogue scale (VAS) score of knee pain, the Patellar tilt angle and the Congruence angle on X-ray were measured before and after the training. **Results.** At the 4-weeks follow-up, VAS change of the exercise group was -2.6 ± 0.89 and the control group was -1.0 ± 1.00 ($P < 0.05$). The change of Patellar tilt angle of the exercise group was 0.44 ± 2.01 degree and control group was 1.48 ± 2.84 degree. The change of Congruence angle of the exercise group was 3.82 ± 4.69 degree and control group was 1.8 ± 7.34 degree. There was no significant difference in radiographic measurements between 2 groups. Furthermore, There was no significant correlation with the change of VAS and radiographic Measurements. **Conclusion.** Therapeutic exercise program might be able to improve the pain in patellofemoral pain syndrome, but radiographic measurements were not changed and no significant correlation with pain was observed.

References

1. Lin YF, Lin JJ, Cheng CK, Lin DH, Jan MH. Association between sonographic morphology of vastus medialis obliquus and patellar alignment in patients with patellofemoral pain syndrome. J Orthop Sports Phys Ther. 2008 Apr;38(4):196-202. Epub 2007 Nov 21.

2. Bily W, Trimmel L, Mödlin M, Kaider A, Kern H. Training program and additional electric muscle stimulation for patellofemoral pain syndrome: a pilot study. Arch Phys Med Rehabil 2008;89:1230-6.

Balneotherapy in treatment of spastic upper limb after stroke

M. Stefanovski, G. Stefanovski, T. Erceg
Institute for physical medicine, rehabilitation and balneoclimatology "Mlječanica", Kozarska Dubica

Introduction. After stroke, spasticity is often the main problem that prevents functional recovery. Pain occurs in up to 70% of patients during the first year post-stroke. (1) Aim: To find out the effects of balneotherapy with sulphurous bath on spasticity and pain in affected upper limb. **Materials and methods.** A total of 40 patients (28 female and 14 male) mean age 64.65 ± 8.66 participated in prospective, controlled study. Inclusion criteria: ischaemic stroke, developed spasticity of upper limb, post-stroke interval < 6 months. Exclusion criteria: contraindications for balneotherapy and inability to follow commands. Experimental (E) group ($n=20$) was treated with sulphurous baths ($31^{\circ}-33^{\circ}\text{C}$) and controlled (C) group with taped water baths, during 21 days (3). All patients were additionally treated with kinezitherapy and cryotherapy. The outcome was evaluated using Modified Ashworth scale for spasticity (2) and VAS scale for pain. The significance value was sat at $p < 0.05$. **Results.** Both groups were homogenous regarding the age, sex, affected side and post-stroke interval. Reduction in tone of affected upper limb muscles was significant in E group ($p < 0.05$). Decrease of pain in both groups was significant (C group: $p < 0.05$; E group: $p < 0.01$). **Conclusion.** Our results show that balneotherapy with sulphurous water reduces spasticity and pain significantly and can help in treatment of post-stroke patients. This study will continue in order to obtain results on larger sample.

References

1. Dormerick AW, Edwards DF, Kumar A. Hemiplegic shoulder pain syndrome: frequency and characteristics during inpatient stroke rehabilitation. Arch Phys Med Rehabil. 2008;89(8):1589-93.
2. Pizzi A, Carlucci G, et al Evaluation of upper-limb spasticity after stroke: A clinical and neurophysiologic study. Arch Phys Med Rehabil. 2005;86(5):410-5.
3. G.Stefanovski, M. Stefanovski, Balneotherapy with sulphurous mineral water in rehabilitation of patients after stroke, Free Papers 2nd World Congress of the ISPRM, Prague (Czech Republic), May 18-22, 2003; (63-68);.

Detectable threshold of knee effusion by ultrasonography in osteoarthritis patients

Jong In Lee, Bo Young Hong, Seong Hoon Lim, Ye Rim Cho, Hye Won Kim, Young Jin Ko.
Department of Rehabilitation Medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea

Introduction. Ultrasonography (US) has been increasingly used for diagnosis and intervention guidance in musculoskeletal disorders [1]. The minimum amount of effusion in knee to be detectable at sonography has been reported at 7 to 10 mL in a cadaveric study [2]. However, no study was done about the sonographic detectable threshold in living patients. The purpose of this study was to identify the detectable threshold of knee effusion by ultrasonography while infusing normal saline in osteoarthritis patients. **Materials and methods.** Forty knee osteoarthritis patients were randomly allocated to two groups, midline and lateral groups. Intra-articular injection of 20 mL of normal saline was done under sonographic guidance. Sonographic images were taken after infusion of each milliliter with the transducer fixated at the midline and lateral side of the suprapatellar pouch in the midline and lateral groups, respectively. **Results.** The smallest amount of infusion for sonographic detection of any effusion was 4.37 mL in the midline group and 4.13 mL in the lateral group. Effusion of more than 2 mm depth with ultrasonography was seen after 7.84 mL and 7.36 mL of infusion in the midline and the lateral groups. And for 4 mm depth, 11.58 mL and 13.13 mL amount of infusion were needed in the midline and the lateral groups. **Conclusion.** To detect effusion by ultrasonography, about 4 mL of fluid is needed. For the definition of knee effusion by ultrasonography, we think 2 mm depth is more appropriate since 4 mm depth requires too much effusion that can leads to false-negative results.

References

1. Keen HI, Wakefield RJ, Conaghan PG. A systematic review of ultrasonography in osteoarthritis. Ann Rheum Dis 2009;68:611-9.
2. Delaunoy I FV, Appelboom T, Hauzeur JP. Sonography detection threshold for knee effusion. Clin Rheumatol 2003;22:391-2.

The effect of hand size on the stimulus intensities required for median and ulnar sensory nerve conduction studies

????
????

Introduction. The objectives were to compare supramaximal stimulus intensities required to obtain median and ulnar SNAP, pain scores, and the occurrences of ulnar CMAP interfering ulnar SNAP by using 14cm. standard distances versus proximal wrist crease. **Materials and Methods.** 20-30 years old healthy volunteers were recruited. Determined hand size by distance between proximal wrist crease to base of middle finger, divided into 3 groups (small ≤ 11 , medium $>11-12$, large >12 cm.), 12 hands/group. Antidromic median and ulnar sensory nerve conduction studies (SNCS) were performed. The nerves were randomly stimulated at proximal wrist crease and 14cm. from recording electrode. Supramaximal stimulus intensity, pulse duration, peak-peak amplitude, VAS pain score and occurrence of ulnar CMAP interfering ulnar SNAP at each stimulating site were recorded. **Results.** All hands required stimulus intensities at 14cm. greater than at proximal wrist crease except 1 large hand in ulnar SNCS. In small hands, greater increase in supramaximal stimulus intensities (median 8-200%, ulnar 1-194%) was required at 14cm. versus at proximal wrist crease, than in medium and large hands. VAS at proximal wrist crease was less than at 14cm. especially in small hands in both nerves. In all hand size, at proximal wrist crease revealed less ulnar CMAP interfering ulnar SNAP than at 14cm. in which the latency differences between ortho- and antidromic techniques were up to 0.4 msec. **Conclusion.** Most subjects required greater stimulus intensities at 14cm. than at proximal wrist crease. Especially in small hands, there were greater increases in VAS with more occurrences of ulnar CMAP interfering ulnar SNAP at 14cm. This study demonstrated the effect of hand size on selecting proper individualized stimulation site.

References

Srisawasdi G, Thanakiatpinyo T. The effect of hand size on the stimulus intensities required for median and ulnar sensory nerve conduction studies. Arch Phys Med Rehabil.

fMRI correlates of early aphasia rehabilitation after stroke

F. Mattioli, C. Sottini, M. Magoni, C. Ambrosi, R. Gasparotti

Introduction. Functional correlates of language recovery after left hemisphere (LH) stroke are thought to have a biphasic pattern (early reduction in left language related areas (LRA) activation in the first few days post stroke, followed by a hyper activation of right homologues LRA in the subacute phase). The effect played by aphasia rehabilitation on functional reorganization of LRA is still unknown. The aim of this study is to compare during a 15 days observation, language scores and fMRI activations of LRA in a group of non rehabilitated and rehabilitated aphasic patients. **Materials and methods.** Six right-handed patients with non fluent aphasia due to stroke in LH underwent a clinical evaluation with Aachen aphasia test (AAT) and fMRI within 3 days after (T1) and 2 weeks after stroke (T2). Two patients were submitted to standard aphasia therapy between T1 and T2, the others were not. An event-related fMRI study was performed (EPRIME, PST) by using a sentence comprehension task. Acquisitions were done by a 1.5 T Siemens, Avanto with an 8-channel receive coil (BOLD and morphological sequences), processed by Brain Voyager QX. A general linear model approach was used for contrast evaluations. Activation in patients was compared with 10 aged-matched controls. **Results.** Rehabilitated patients showed a greater improvement in AAT score than non rehabilitated ones. Rehabilitated and not rehabilitated patients showed at T1 a similarly decreased activation in both LH and RH language areas, compared to controls. Rehabilitated patients showed at T2 a greater activation in LH language areas, compared to RH LRA and did not show right Broca Homologue (Bho) and insula activation, differently from not rehabilitated ones. **Conclusion.** Early aphasia therapy may improve language; its functional correlates may be represented by a LH earlier activation of LRA. Our preliminary results confirm two different phases of brain language reorganization, which can be modulated by speech therapy. They do not support a positive role of RH in aphasia recovery and an specific activation of right Bho due to training.

References

Saur Det al. Brain 2006;129:371-4.

Handgrip strength as a prognostic of short-term survival among inpatients at a palliative care unit

D. Colprim¹, MF. Rojas², C. Farriols¹, M. Riera¹, T. Prat¹, M. Luna¹, J. Planas¹, JM. Muniesa²

¹Unitat Cures Pal·liatives

²Servei Medicina Física i Rehabilitació
Parc De Salut Mar, Barcelona, Spain

Introduction. To determine if hand grip strength (HGS) of patients with advanced cancer diagnosis admitted into a Palliative Care Unit (PCU) can be used as a prognostic factor of short-term survival. **Materials and methods.** Observational, prospective and comparative study of patients admitted consecutive into a PCU during 5 months. Inclusion criteria: >18 years old, Karnofsky Index ≥ 30 , Pfeiffer's test < 8 and advanced cancer diagnosis. 62 patients agreed to participate in the study. Sample characteristics: 67.75% were male, average age was 72.87 ± 11.02 years old, Barthel Index: 40.11 ± 24.28 , Karnofsky Index: 40. Among the first 48 hours of admission at PCU, 3 consecutive determinations of HGS (JAMAR® 5030J1 Hand Dynamometer) were performed for each patient, supervised by a trained person. The highest value measured was compared with HGS reference values for adults grip strength according to gender and age and survival at discharge. Patients were divided in two groups according to their standardization. The first one ≤ -2 standard deviations (SD) and the second one ≥ -2 SD. Data has been analyzed with SPSS Statistics using T-student and Kaplan-Meier survival curve. **Results.** There has not been a statistical difference ($p = 0.638$) correlating the HGS standardized at admission between patients who were alive (SD -1.8 ± 0.79) or death (SD -1.92 ± 1.13) at discharge. Patients with ≤ -2 SD had a survival at first 15 days of $77.2\% \pm 18.78\%$. At 21 days of $55.1\% \pm 18.78\%$. Patients with ≥ -2 SD had a survival at 15 days of $66.46\% \pm 18.26\%$. At 21 days of $48.96\% \pm 20.18\%$. Survival comparison between groups did not show any statistical difference $p = 0.3037$. **Conclusion.** Determination of HGS at the first 48 hours of admission is not a predictor of survival at discharge. Patients who have ≥ -2 SD do not have higher mortality compared to other patients during admission.

Short term outcome effects of selective dorsal rhizotomy (SDR) in patients with cerebral palsy

L. Boscolo Bozza, M. Santin, M. Coluccini, G. Sabrina, A. Salghetti, S. Zeme, E. Trevisi

"La Nostra Famiglia" di Conegliano, Ospedale Le Molinette Torino
Reparto Neurochirurgia

Introduction. The present study tests the effects of selective dorsal rhizotomy in patient with cerebral palsy. **Materials and methods.** Prospective observational study including 4 patients (8 ± 4.2 years old, 2 females and 2 males) affected by spastic dyplasia treated with SDR. Each patient was tested before (T0) and after surgery at 20 days (T1), 3 months (T2), 6 months (T3), 8 months (T4) and 12 months (T5) with clinical evaluation, gait analysis and oxygen consumption K4. Inclusion criteria: diagnosis of spastic dyplasia documented by IMR, age between 4 and 12 years, good/moderate muscle power, walking with or w/o aids, adequate cognitive functions and good compliance to the treatment. Outcome measures: GMFM, Ashworth, PROM, MRC, Selective Motor Control (SCALE), Gait Analysis and K4. **Results.** Short term effect after surgery showed a significant reduction of spasticity (Ashworth score at T0: 1.11 ± 0.64 ; T1: 0.4 ± 0.21 ; T2: 0.43 ± 0.1), increase of PROM at ankle dorsiflexion (knee extended, T0: $1.25^\circ \pm 3.95$, T1: $2.5^\circ \pm 7.47$ and T2: 7.5 ± 4.24 ; knee flexed, T0: 10 ± 8.2 ; T1: 13.7 ± 7.7 ; T2: 17.5 ± 6.7), popliteal angle (T0: $130,62 \pm 11,78$, T1: 132.5 ± 8.45 , T2: 142.5 ± 5.97), and improvement of SCALE (T0: 0.57 ± 0.19 , T2: 1.3 ± 0.16). Muscular strength recovery increased rapidly from T0 to T2 (Tibialis Anterior T0: 3.24 ± 0.9 ; T1 2.87 ± 0.9 ; T2: 3.9 ± 0.5). Six and twelve months after surgery a significant improvement of GMFM score, gait velocity, stride length and cadence were observed together with increment of joint ROM and reduction of Oxygen Consumption. **Conclusion.** Preliminary results of our study support the evidence that SDR might be used in order to decrease spasticity, improve the PROM and walking ability in selected children with dyplastic cerebral palsy. Long term effectiveness of treatment should be verified with follow up study and increasing the sample group.

References

Peacock WJ, Staudt LA. Spasticity in cerebral palsy and the selective posterior rhizotomy procedure. J Child Neurol. 1990 Jul;5(3):179-85.

Dynamometry 's predictive value in hospitalized elderly patients

M.F. Rojas MF¹, M. Arellano², J.M. Muniesa¹, M. Pi-Figueras², M.D. Sánchez², F. Escalada¹, O. Sabartés², M.A. Márquez²

¹Servicio de Medicina Física y Rehabilitación

²Servicio de Geriatria. Hospital de L'Esperança. Parc de Salut Mar, Barcelona, Spain

Introduction/Objective. To evaluate dynamometry as a predictor of functional recovery in elderly patients admitted to an Acute Geriatric Unit (AGU). **Materials and methods.** AGU patients who were able to perform a dynamometry were included. Dominant hand grip strength was measured at admission. Relationship between gripping strength and age, cognitive status (measured by Pfeiffer test (PT)), functional status before acute illness at admission and discharge (measured by Barthel index (BI) and Lawton index (LI)), functional loss at admission, functional recovery at discharge and total functional loss was studied. Functional loss: (pre-acute illness BI - admission BI/pre-acute illness BI) x 100. Functional recovery: (discharge BI - admission BI/pre-acute illness BI - admission BI) x 100. Functional total loss: (pre-acute illness BI - discharge BI/pre-acute illness BI) x 100. **Results.** 130 patients, 72 women and 58 men (mean age of 86 years old) were included. Mean hand grip strength was 16.6 kg for male and 10.31 kg for female. In both genders hand grip strength was positively related to pre-acute illness BI (men p0.005, women p0.003), admission BI (men p0.0004, women p0.0003), discharge BI (men p0.006, women p0.003) and LI (men p0.0001, women p0.007). Dynamometry was negatively related to functional loss (men p0.007, women p0.02) and PT (men p0.0001, women p0.004). Dynamometry was not correlated to functional recovery or functional loss. In both genders BI at discharge was independently related with pre-acute illness BI ($p < 0.001$) but not with hand grip strength. **Conclusion.** Hand grip strength is a good indicator of functional and cognitive status before acute illness and at admission. Hand grip strength is not useful as a predictor of functional recovery or total functional loss in elderly patients. Hand grip strength can predict discharge functional status but it doesn't add predictive value to the determination of pre-acute illness Barthel index.

Results after developing a standard program to assess Dysphagia in a Rehabilitation Department

A. Guillén Solà, M.F. Rojas Padilla, R. Boza Gómez, E. Duarte Ollé, R. Belmonte Martínez, M. Tejero Sánchez, E.M. Navarro
Physical Medicine and Rehabilitation Department. Hospitals del Mar-Esperança. Parc de Salut Mar. Barcelona.

Introduction. Swallowing disorders (dysphagia with or without bronchoaspiration) are present in nearly 27-70% of patients with acute stroke, depending on the series. In a rehabilitation department the Oropharyngeal Dysphagia as a diagnostic is frequent, not only due to stroke, but for neoplastic pathology, radiotherapy - chemotherapy side-effects and neurodegenerative diseases. **Materials and methods.** To describe our results in 2009 of a new standard program developed to evaluate dysphagia, based on clinical evaluation, a volume-viscosity test for clinical screening and a videofluoroscopic (VDF) study of swallowing. **Results.** In 2009 we have conducted about 164 VDF (132 new studies and 32 reviews), in front of 35 realized in 2005. By pathology: 62% Stroke, 6.8% Neurodegenerative diseases (ME, ALS), 9.1% Oropharyngeal Cancer, 3% Spinal surgery, 13% other etiologies. Stroke outcomes: 34.1% Anterior Circulation, 23.7% posterior circulation and 4.5% lacunar syndrome. We have adjusted diets in 68% of the cases based on the Volume-viscosity test results which were confirm by VDF. An 87% of patients needed logopedic treatment. **Conclusion.** We have had a gradual increase of VDF since 2005. To implant a standardized program for assessing dysphagia permits to improve the therapies and to avoid further medical complications. The volume-viscosity test for clinical screening of swallowing is an easy and useful technique for bedside dysphagia evaluation.

References

- Clavé P et al. Accuracy of the volume -viscosity swallow test for clinical screening of oropharyngeal dysphagia and aspiration. Clin Nutrition 2008.
Mann G et al. Swallowing Function After Stroke. Stroke 1999;30:744-748.

The Impact of Cognitive Status at Admission on Functional Outcome of Elderly Hip Fracture Patients at Discharge

E. Dubljanin-Raspopovic, S. Tomanovic, M. Manojlovic, T. Radovanovic, U. Nedeljkovic, N. Krstic, N. Ilic, S. Markovic, V. Vesovic Potic

Physical medicine and Rehabilitation Clinic, Clinical Center of Serbia

Introduction. The number of patents with dementia increases amongst hip fracture patients. Cognitive dysfunction is defined as a premonitory state which is potentially negatively related to short-term functional outcome.¹ **Materials and methods.** A prospective cohort study of 239 consecutively hospitalized elderly patients (≥ 65 years) with acute hip fracture in a acute care setting utilizing a multi-disciplinary hip fracture service was carried out. Cognitive status was assessed on admission by the Short Portable Mental Status Questionnaire (SPMSQ). Functional status was assessed by the FIM motor subscale on admission and before discharge; absolute functional gain was determined by the motor FIM gain. The cutoff level of fewer than three, or three or more correct answers used to compare functional outcome between cognitively intact, or patients with only mild and moderate impairment (SPMSQ score ≥ 3) and those patients with severe cognitive dysfunction (SPMSQ < 3).² **Results.** Both cognitively impaired and cognitively intact hip fracture patients exhibited overall FIM motor improvements as well as functional gains in specific FIM motor areas ($p < .01$). However, patients with a SPMSQ score of < 3 had a significantly worse functional outcome at discharge compared to patients with a score ≥ 3 ($p < .01$). **Conclusion.** The systematic use of the MMSE identifies cognitively impaired hip fracture patients, and effectively predicts their short-term functional outcome. A higher admission cognitive status is related to a more favorable short term rehabilitation outcome. In spite of cognitive impairment, elderly patients with hip fracture can benefit from inpatient rehabilitation. The systematic identification of cognitively impaired hip fracture patients on admission facilitates optimal treatment and rehabilitation, and thus enables the best achievable outcome to be reached.

References

1. Chudyk AM, Jutai JW, Petrella RJ, Speechley M. Systematic review of hip fracture rehabilitation practices in the elderly. Arch Phys Med Rehabil. 2009 Feb;90(2):246-62.
2. Söderqvist A, Miedel R, Ponzer S, Tidermark J. The influence of cognitive function on outcome after a hip fracture. J Bone Joint Surg Am. 2006 Oct;88(10):2115-23.

Adaptation and validation of the Ankylosing Spondylitis Work Instability Scale (AS-WIS) for use in Turkey

Ayşe A. Kucukdeveci¹, Sebnem Ataman¹, Aysun Genc¹, Sehim Kutlay¹, Atilla H. Elhan², Alan Tennant³

¹University of Ankara, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Turkey

²University of Ankara, Faculty of Medicine, Department of Biostatistics, Turkey

³University of Leeds, Faculty of Medicine and Health, Department of Rehabilitation Medicine, UK

Introduction. Ankylosing Spondylitis Work Instability Scale (AS-WIS) is a recently developed, 20-item measure to assess work instability (a mismatch between an individual's abilities and job demands) in AS. The aim of this study is to adapt the AS-WIS to Turkish and to test its reliability and validity. **Materials and methods.** After the translation process, 132 actively working patients with AS (mean age 37.8 \pm 10.7, 77% male) were assessed by the AS-WIS. Reliability was tested by internal consistency, person separation index and intra-class correlation coefficient (ICC); internal construct validity by Rasch analysis and external construct validity by associations with Bath AS Disease Activity Index (BASDAI), Bath AS Functional Index (BASFI) and the AS Quality of Life Questionnaire (ASQoL). **Results.** Reliability was good with a Cronbach α and person separation index of 0.88 and test-retest ICC of 0.91. The data showed good fit to Rasch model expectations with a mean item fit of -0.477(SD 1.047), person fit of -0.284(SD 0.894), chi-square interaction 60.9 (df40, p=0.018). There was no differential item functioning by age, gender, disease duration or work type. The scale was strictly unidimensional. The median score on the AS-WIS was 12.9 (IQR 7-15). 40.2% of the patients were at low risk, 50.8% at medium risk, and 9.1% were at high risk of having to give up their work.

External construct validity of the AS-WIS was confirmed by expected correlations with BASDAI, BASFI and the ASQoL (Spearman r 0.41, 0.32, 0.59, respectively). **Conclusion.** The Turkish adaptation of the AS-WIS is reliable, valid and available for use in routine clinical setting to identify those patients who are at risk of having to give up their current job.

References

Gilworth G, et al. Reducing work disability in Ankylosing Spondylitis – development of a work instability scale for AS. *BMC Musculoskeletal Disorders* 2009, 10:68.

Effects of intrathecal ziconotide and baclofen on pain and spasticity in spinal cord injury

G. Stampacchia¹, E. Bradaschia¹, A. Gerini¹, G. Sanguinetti², M. Menarini¹
¹*SD Miellezioni, Dipartimento Neuroscienze, Azienda Ospedaliera Universitaria Pisana*
²*Unità Spinale, Istituto di Riabilitazione di Montecatone.*

Intrathecal baclofen administration by an implantable delivery system (ITB) reduces spasticity and pain due to spasms in spinal cord injured (SCI) subjects, but in some cases neuropathic pain persists. A new analgesic drug, ziconotide, is now available for intrathecal delivery. The aim of the present experience is to study if the ziconotide addition to baclofen for intrathecal administration reduces this remaining neuropathic pain. **Materials and methods.** Six SCI subjects, four with dorsal level (2 ASIA A, 1 B and 1 C) and two with cervical (ASIA D) were submitted to ITB treatment with a continuous infusion of different doses (range 180-840 µg/day) obtaining a clear spasticity reduction but a strong neuropathic pain persistence. Ziconotide was added to baclofen beginning with a low flow, 1.2-1.5 µg/day, gradually increased up to 2.3-6.5 µg/day. The pain amount was recorded using a VAS scale graded from 0 to 10. **Results.** Five out of six subjects experienced a pain reduction from 9.4±0.5 to 4.4±3.0 (t-test $p < 0.05$). A spasticity decrease was observed in all subjects; in two we needed to reduce the baclofen flow from 650 to 530 and from 320 to 150 µg/day because of excessive hypotonia. Adverse effects were: headache, dysgeusia, urinary disorders, weakness, dysesthesia, mnesic deficits, confusional syndrome. Because of side-effects with low pain reduction, two subjects stopped ziconotide therapy. In other two cases, suffering side effects but having high pain reduction, ziconotide was stopped and then restarted with lower doses. **Conclusion.** Ziconotide can be mixed in pump with baclofen to obtain a pain reduction; adverse effects are similar to the described with ziconotide treatments alone. In this experience ziconotide enhances the antispastic effect of baclofen.

Efficacy of physical agents in management of chronic Low Back Pain (LBP)

M. Nazzal, Z. Auwaidat, Z. Subaih, M. Maaiah, M. Nazzal
Jordan University of Science and Technology, Irbid, Jordan

Introduction. Low back pain (LBP) is a major health concern associated with disability and socioeconomic consequences. The efficacy of using short term concurrent physical agents in the management of (LBP) is still unclear. Therefore, the current study examined the combined effect of physical agents on (LBP) functional indices and capacity, and pain scales in patients with (LBP). **Materials and methods.** A total of 32 females and 18 males diagnosed with (LBP) participated. The treatment plan included 4 weeks of combined exercise, ultrasound, TENS, and manual massage given 3 times weekly. Functional indices and pain scales, including trunk left and right lateral bending, forward flexion, extension, Oswestry disability scale, McGill pain scale, and visual pain scale were evaluated before and after the treatment. The change in the average of studied parameters before and after treatment was analyzed using pair t test. Analysis was conducted using SPSS. A-value of less than 0.05 was considered statistically significant. **Results.** After treatment, the average score of Oswestry disability index, McGill pain scale and visual pain scale decreased significantly. However, the average of extension and forward bending increased. Except lateral bending for the right side among females, all parameters changed significantly when subjects are categorized according to gender and age. **Conclusion.** Use of concurrent physical agents improves indexes related to (LBP) functional indices and pain scales. Additionally, results indicated that physical agents might be an effective treatment and future studies should examine incorporating these agents in the management plan for (LBP).

References

Sebnem D et al. Comparison of three different approaches in the treatment of chronic (LBP), *Clin Rheumatol* (2008)27:873-881.
 Mary B et al. Changes in disability following physical therapy intervention for patients with (LBP), *Phys Med Rehabil* 2006;87:749-56.
 Jette Am et al. A Physical therapy treatment for musculoskeletal impairment; *Physical Therapy* 1997;77:45-54.

Long thoracic nerve palsy in three cases

A. Farmakides, V. Aggeli, I. Sioutis, N. Roussos, V. Mani, S. Fotaki, D. Patatoukas
PRM Department, "Asklepieion" General Hospital, Voula, Greece

Introduction. Long Thoracic nerve is susceptible to injuries due to its long course. Injuries of this nerve has been reported in almost all sports, during overstretching of the arm, from currying heavy objects over the shoulder. Winging of the scapula due to long thoracic nerve palsy is associated with secondary pain and spasm due to muscle imbalances and tendonitis around the shoulder joint. **Materials and methods.** Three patients with shoulder pain and dysfunction in our outpatient rehabilitation department. Winged scapula was the main sign and long thoracic nerve palsy was diagnosed clinically confirmed with electrodiagnostic (EDX) procedures. **Results.** Patient No1 was a 19 years old volleyball player who experienced aching shoulder pain during vigorous competitive game. EDX study revealed long thoracic nerve neuropraxia without involvement of brachial plexus. Patient 2 was a 18-years old break-dancer who experienced an aching shoulder pain during dancing. EDX studies showed an isolated long thoracic nerve with axonotmesis. Third patient was a 32-years old housekeeper female who experienced shoulder pain due to overstretching of her arm during housekeeping. EDX studies revealed an isolated long thoracic nerve neuropathic lesion. All patients were treated conservatively with biofeedback, and strengthening exercises. The two patients with neuropraxia of long thoracic nerve were free of symptoms and signs in 15 and 20 days, whereas the third patient with axonotmesis was referred to orthopaedic department after 3 months because of failing of conservative therapy. **Conclusion.** Long Thoracic Nerve injury is more common than is believed. Any shoulder pain must be examined for winging of the scapula. Differential diagnosis includes brachial plexus lesion. Conservative treatment is optimal for neuropraxia of the nerve and sometimes for axonotmesis.

Incidence and risk factors of heterotopic ossification in traumatic brain injury

G. Fotinopoulos, V. Aggeli, E. Chalida, N. Roussos, I. Sioutis, V. Mitsis, D. Patatoukas
PRM Department, "Asklepieion" General Hospital, Voula, Greece

Introduction. To determine to incidence of heterotopic ossification in traumatic brain injury patients and to assess several risk factors for the occurrence of HO. **Materials and methods.** Thirty three consecutive inpatients with brain injury admitted in our rehabilitation department during the past 5 years after recovering from coma. It is a retrospective study. X-rays of big joints and bone scan were used for HO determination. Statistical analysis were conducted using chi-square test and correlation coefficient test. **Results.** Heterotopic ossifications were observed in 17 patients (incidence 51.52%) and in 34 joints (2 joints/patient). Most of them were localised at the level of the hip (18), of the knee (7) and of the elbow (5). No significant relation was found between heterotopic ossification and sex, age, coma duration, brain surgery, sipsis, and associated limb fractures. Statistic regression showed a significant positive correlation between HO and spasticity. Ten out of 13 (76.92%) patients with predominant pyramidal symptoms (increased muscle tone) developed HO, whereas 7 out of 20 (35%) patients with predominant ataxia symptoms developed HO (P= 0.018). **Conclusion.** The presence of spasticity may predict the chance of developing heterotopic ossification in patients with severe head injury.

Factors influencing length of stay in patients with traumatic brain injury

E. Chalida, V. Aggeli, G. Fotinopoulos, I. Sioutis, N. Roussos, S. Fotaki, D. Patatoukas
PRM Department, "Asklepieion" General Hospital, Voula, Greece

Aim of the study. To investigate the influence of the severity of brain injury, the level of Functioning at admission, and the medical

comorbidities on the Length of Stay (LoS). **Materials and methods.** Thirty three consecutive inpatients with brain injury referred from ICU to our rehabilitation department during the past 5 years with Glasgow Coma Scale >8. Chi-square test and correlation coefficient were used for statistical analysis. **Results.** Length of Stay in a rehabilitation department was not influenced from the age (38.8±14.5) of the patients. Patients with lower Motor FIM (p=0.0031) and lower cognitive FIM (p=0.0053) at admission stayed more days in the rehabilitation department than patients with higher scores. Patients with more severe brain injury who stayed longer in the Intensive Care Unit, stayed also longer in the rehabilitation department. Of the medical complications LoS was not influenced from concurrent long bone fractures and from brain surgery. Patients with heterotopic ossification stayed longer (122.1±89.8 days) than patients without (67.15±9.9 days) (p=0.048). Finally patients with spasticity as predominant sign stayed longer (144.7±92.8 days) than patients with ataxia (63.4±52.3 days) (p=0.003). **Conclusion.** Severity of injury is the most significant predictor of LoS. Other factors are heterotopic ossification and spasticity.

Change in Quality of Life of Disabled Patients after Intensive Inpatient Rehabilitation at Siriraj Hospital

T. Ploypetch, P. Dajpratham

Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

Introduction. To compare the quality of life (QOL) before and after intensive rehabilitation in disabled patients and to examine the factors associated with the change in QOL. **Materials and methods.** A retrospective chart review of 200 disabled patients who were admitted to inpatient rehabilitation during year 2006 – 2009. WHO-QOL-BREF-THAI (26 items) was used to assess QOL. Demographic data, physical and psychosocial status, Modified Barthel ADL Index (BAI) were collected and examined the association with change in WHOQOL score. **Results.** There were 117 (58.5%) males and 83 (41.5%) females with mean age 55.64 (SD17.91) years old. Various principal diagnoses resulting in the disability were included such as 112 (56%) stroke, 54 (27%) spinal cord injury and 34 (17%) other diagnoses. After intensive rehabilitation, quality of life perception was improved in 164 (82%) disabled patients. There was significant difference in mean WHOQOL scores on admission and at discharge which were 81.26 (SD 11.22) and 85.5 (SD 11.04) respectively. The mean changed score was 4.24 (SD 8.05). However, four domains of WHOQOL were improved except the social domain. The change in WHOQOL score was significantly higher in the patients without non-familial caregiver (OR 3.62, 95%CI 1.53 to 8.55) and joint contracture (OR 3.27, 95%CI 1.47 to 7.25). **Conclusion.** Inpatient intensive rehabilitation can significantly improve quality of life in the disabled patients. Having joint contracture prior to rehabilitation and non-available familial members for taking care are the factors that lessen WHOQOL score improvement.

References

Ploypetch T, Dajpratham P. Change in Quality of Life of Disabled Patients after Intensive Inpatient Rehabilitation at Siriraj Hospital.

Bioethics and Rehabilitation

????

????

Over the last twenty years, medicine has made enormous progress. These frenzied changes have developed a series of questions of moral and legal type cherishing worries and fears for the scenarios of the future. Of all these concerns attempts to take on a new discipline, *bioethics: what and how is right to act in the exercise of medicine?* There isn't problem bioethics which someone of us can say: do not concern me. And this is especially true for rehabilitators called to take care of particular patients: the "disabled". Called, we said, to rehabilitate that "re-make skillful". And all this without automation, never forget that the word disabled, does not really indicate a man, and man is "person". Whenever you come into contact with the physical reality of a man (as is the case of rehabilitation with the disabled person) take up contact with the person, with the full weight of his dignity. Considering the purpose of medicine a partial purpose (health protection) and ethics a global purpose (ultimate), only in that way ethics can say something to medicine about his approach, and then the consciousness of the purpose becomes

necessary reference for professional ethics. Pellegrini's words: "In complex and pluralistic democracies of today, the widespread appeal to efficiency is not entirely acceptable and becomes insufficient because it not produces the cooperation and consent of citizens. This fact returns the Ethics as a prerequisite to efficiency". This reaffirms that to have the ability to do "good the Good" not enough to possess the correct procedures, but it's necessary to interpret the health profession as a place of beloved service to society.

References

1. Agazzi E. Quale etica per la bioetica, Franco Angeli, Milano, 1990
2. Ippocrate Antica Medicina Giuramento del Medico, Milano, Rusconi, 1998
3. Sgreccia E, Miele V, Miranda G. Le radici della bioetica, Milano Vita e Pensiero, 1998.
4. Singer P. Etica pratica. Napoli, Liguori, 1989.

Particularities of diagnose and evolution of progressive ossifying fibrodysplasia (FOP)

R. Popescu¹, O. Rogoveanu¹, Ș. Gavrilă², R. Trăistaru¹

¹University of Medicine and Pharmacy Craiova, Romania

²Emergency Hospital Craiova

Introduction. Progressive ossifying fibrodysplasia is an autosomal dominant transmitted genetic disease of rare incidence (1 in 2 million persons) which is characterized by painful tumefaction of the soft tissues, with chronic evolution and spontaneous exacerbations, all these being joined by a heterotopic progressive ossifying process.

Case report. Our case regards a female patient, age 33, which has been diagnosed with progressive ossifying fibrodysplasia when she was 17 years old, as a result of the association between toes malformations and right hip ossifications. The clinical manifestations were triggered by a falling trauma episode at the age of 5. The first time she came at our hospital was in July 1997 and the patient presented generalized amiothofria, contracting maseter muscles therefore limiting the oral orifice (3cm), dextroconvex scoliosis with deformed thorax, retracted deltoid, bilateral coracobrachial and pectoral muscles, bilateral elbow flexis ankylose and multiple 1 to 3 cm bone growths on the upper and lower limbs. The X-ray showed masive ossifications of the bilateral pectoral muscles and the brachial biceps muscles, also bilateral hallux phalanx synostosis. The patient underwent many treatments with anti-inflammatory and decontractant pills, electrotherapy, sedative massage, criotherapy, kinetotherapy. Currently, her general state is almost constant due to the physical treatment of recovery although the ossifying process continued, its extension being proven by the soft tissue ultrasound. The lung ventilation function was maintained under acceptable limits with only 10% decrease of the ventilation parameters in comparison to 1997. The particularity of the case consists of the emerge of ultrasound detected liver and spline parenchyma calcifications although literature does not specify any visceral effect. **Conclusion.** Although progressive ossifying fibrodysplasia is a disease with invalidant and progressive evolution, a correct and constant physical therapy can truly help the life comfort of these patients.

The electrophysiological evaluation of the medical recovery programme of patients with stroke related motor deficit

R. Popescu, O. Rogoveanu, R. Trăistaru

University of Medicine and Pharmacy Craiova, Romania

Introduction. Strokes have the highest rate of morbidity and mortality out of all diseases worldwide. The post-stroke recovery represents the treatment the patients with muscular tonus modifications undergo in order to return to a normal life and integrate again into society. **The purpose of the study.** The analysis of the electrophysiological modifications of the skeletal muscle fibers using the unitary electromiogram (EMG) at all patients with post-stroke hemiparesis and hemiplegia. **Materials and methods.** We selected a group of 12 patients with ischemic stroke and hemibody motor deficit. Unitary electromiogram was used in order to analyse the electrophysiological activity of the deteriorated muscles (NEUROPAQ-MEB-9100 system). The initial results were compared to those which were noticed after 12 weeks of treatment. **Results and discussions.** A decrease of voluntary activity (regarding the frequency and the amplitude of EMG) was noticed and also abnormal potentials in voluntary contractions. 10 out of 12 patients included in the study favorably responded to thermotherapy,

cryotherapy, electrotherapy and massage and the EMG voluntary activity increased. 2 of the patients initially had re-innervation polyphasic EMG potentials of high amplitude (more than 150 microV) and long period (more than 35 msec). The recovery regarding these patients was not efficient and the disease led to muscle atrophy and spasticity. **Conclusion.** EMG evaluation at patients with motor deficit caused by upper motor neuron lesions can offer clues about the chances of recovery and the efficiency of the medical recovery programmes.

References

1. Osmond W, Flegal K, Friday G et al. Heart disease and stroke statistics—2007 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation* 2007;115:169-171.
2. Donnan GA, Fisher M, Macleod M, Davis SM. Stroke. *Lancet* 2008;371:1612-1623.
3. Lukacs M, Vecsei L, Beniczky S. Changes in muscle fiber density following a stroke. *Clin Neurophysiol* 2009;120: 1539-1542.
4. McKenzie MJ, Yu S, Prior SJ, Macko RF, Hafer-Macko CE. Hemiparetic stroke alters vastus lateralis myosin heavy chain profiles between the paretic and nonparetic muscles. *Res Sports Med* 2009;17:17-27.

Coaching and rehabilitation team. “Happy team”

Jaci Molins¹, M. Valdés², TR Fernández², E. Calero², S. Ródenas², R. San Segundo²

¹Head of department and master's degree in coaching

²rehabilitation's associate doctors with basic training in coaching
Rehabilitation Department of “Xarxa Sta. Tecla de Tarragona” (Spain)

Introduction. The individual coaching intended for company's managers is used a lot to get a better performance; it's application on teams is more recent and it's quite rare it's use in a rehabilitation department. Our aim is to apply coaching to our team to get a better efficiency in our joint work. **Materials and methods.** 6 rehabilitation doctor's team: 1 professional coach, 5 with basic training in coaching. Methodology 2 phases: 1. Team values definition and actions to achieve them (1). 2. Coaching methodology application in meetings (2): rotary roles distribution to the team members: coach, co-coach or observer, time controller, the one who forces the decision, active participants. Monitoring of the actions done between meetings. **Results.** During a year period (2008) on which coaching has been applied, it has been achieved (3): Definition and application of the values: creativity, commitment and joy. This involved a greater unity for all the team: “happy team”. More involvement and participation from all the team members in the meetings. Achievement of the actions proposed in the meetings. **Conclusion.** This is a qualitative study just applied to one team, so we can't take conclusions from it. Even though, we want to transmit our experience to other rehabilitation departments, since it helped us to have clear common values, consolidate the relationships between the team members and become more efficient in the meetings.

References

1. Salvador García. Simon Dolan. La Dirección por valores. Barcelona: Ed. Mc Graw Hill; 1997
2. Alain Cardon. Coaching de Equipos. Barcelona: Ed. Gestión; 2000
3. J. Molins, E. Calero, T. Fernández, M. Valdés, S. Ródenas, R. San Segundo. Nuestra experiencia en coaching de equipo en rehabilitación (oral comunicación). 47º Congreso SERMEF Valladolid; mayo 2009.

Coaching and rehabilitation. Coaching's descriptive preliminary study applied to rehabilitation patients cases

Jaci Molins¹, TR Fernández², R. San Segundo², E. Calero², S. Ródenas², M. Valdés²

¹Head of department and master's degree in coaching

²Rehabilitation's associate doctors with basic training in coaching
Rehabilitation Department of “Xarxa Sta. Tecla de Tarragona” (Spain)

Introduction. Coaching is a change process to get aims which can also be applied to health. The “Coach Group” from Melbourne (1) proved that the patients who had suffered a heart attack improved their healthy habits (diet, exercise...) when coaching was performed on them. Applied to rehabilitation the communication with the patient can be better (2) and also can make them undergo the treatment in all those cases when they wouldn't collaborate (3). With this

purpose we have applied coaching to patients with different pathologies as a preliminary study to value it's possible current use in rehabilitation. **Materials and methods.** Descriptive study of 9 cases of patients with the next pathologies: Hemiplegia, multiple sclerosis, polineuropathy lower extremities, double amputation, gonartritis, lumbar arthrosis, sciatica, neck pain and fibromyalgia None of the patients made the rehabilitation exercises neither carried out any activity because of psychological reasons, not for physical handicaps. **Methodology coaching.** 1. Application of the change's enabling conversation steps: priorities, objectives, options, obstacles, commitments and monitoring. 2. Communication skills: empathy, active listening, questions and feed-back. Number of meetings: 5 for patient. **Results.** In all the patients it has been achieved a greater involvement on the treatment and they had fulfilled the actions they set out, each one in accordance with their own capacities. **Conclusion.** Although with this kind of study we can't draw any conclusions, it's useful to propose, in the future, a random study that proves the efficacy of coaching applied to rehabilitation.

References:

- 1.COACH group. Coaching patients on achieving Cardiovascular health Arch. Int. Med. 2003;163:2775-2783.
2. J. Molins Roca, C. Daufi Subirats, R. San Segundo Mozo, T. Fernández Ferreras. Aplicabilidad del coaching a la rehabilitación. *Rehabilitación (Madr)* 2008, 42 Supl I: 127.
3. Jaci Molins. Coaching salud. Barcelona: Ed. Plataforma; 2010. (in preparation).

Prevention of venous thromboembolic complications in post-acute stroke patients: it can be done better!

J.M. Kruitbosch¹, C.P. Pijlman²

¹Consultant Physical Medicine & Rehabilitation, De Hoogstraat Rehab Centre, Rembrandtkade 10, TM Utrecht, The Netherlands.

²Consultant Physical Medicine & Rehabilitation. Blixembosch Rehab Centre, Toledolaan 2, BJ Eindhoven, The Netherlands

Introduction. In 1997 we found that the incidence of venous thrombo-embolism (VTE) amongst post-stroke in-patients in our rehab centre was 9%, including hospital VTE. VTE resulted in morbidity, delay in rehab and inefficient use of beds. Prophylaxis until then was dictated by referring hospitals. We changed our prophylaxis from January 1998. Now, we want to present the results of this change by comparing the VTE incidence within patients prior to and those after the change in prophylaxis. **Materials and methods.** A retrospective research on hundreds of patient files. Information on patient characteristics, type (haemorrhage or infarction) and severity of stroke was gathered and compared with information on VTE and prophylaxis. **Results.** A total of over 300 files were analyzed. The incidence of VTE, including hospital VTE, had dropped from 9% to 4%. Excluding hospital VTE, the incidence dropped from 4% to below 0.4% (significantly) in both types of stroke. **Conclusion.** Incidence of VTE within a sub-acute stroke population can be drastically reduced in a clinical rehabilitation setting. VTE prophylaxis for sub-acute stroke patients should get more attention from clinicians since VTE reduces both functional outcome and quality of life of these patients.

References

- Brandstater ME, Roth EJ, Siebens HC. Venous thromboembolism in stroke: literature review and implications for clinical practice. *Arch Phys Med Prefab*. 73 (suppl): 379, 1992.
- Kahn SR, Hirsch A, Shrier I. Effect of postthrombotic syndrome on health-related quality of life after deep venous thrombosis. *Arch Int Med* 2002; 162: 1144-8.
- Burke DT. Prevention of deep venous thrombosis: overview of available therapy options for rehabilitation patients. *Am J Phys Med Rehab* 2000;79(suppl):S3-8.
- Harvey RL, Lovell LL, Belanger N, Roth EJ: The effectiveness of anticoagulant and antiplatelet agents in preventing venous thromboembolism during stroke rehabilitation: a historical cohort study. *Arch Phys Med Rehabil* 2004 Jul;85(7):1070-5.

Assessment of disability in knee osteoarthritis

D. Drăgoi¹, D. Matei, R. Trăistaru, R. Popescu

¹Student University of Medicine and Pharmacy Craiova
Rehabilitation Clinic, University County Hospital, Craiova, Romania

Introduction. Osteoarthritis is a long-term disease that affects especially aged people. (1) Pain, joint swelling and stiffness, and for-

ced immobility gradually lead to difficulty in physical functioning, such as walking and going up and down the stairs.(2) The aim of this study is to investigate the disabilities and to evaluate the quality of life in patients with knee osteoarthritis. **Materials and methods.** The patients (N:21) included fulfilled the ACR criteria for knee OA. They rated both their disease status and pain on a visual analog scale; we also used Lequesne index and MHAQ. **Results.** The rural/urban ratio was 4/2, 17% of all patients having a BMI above average. The presence of pain and functional deficiency had sleeping repercussions (R 0.421) for almost 50% of the patients taken into account. Both the Lequesne index and the WOMAC questionnaire were significantly correlated with the level of pain (R 0.723, R² 0.598), especially for females and patients living in the rural area. Subjects residing in an urban area appreciated the repercussion of the pain component of knee OA on the quality of life as very important. (R 0.699). **Conclusion.** Complex evaluation showed the impact of the clinical and functional status on the life quality of patients with knee OA, thus supporting the importance of complex therapy orientation according to symptoms and disabilities induced by the degenerative process.

References

1. Giuliana Nicolau, Melissa M. Yogui, Tatiana L. Vallochi, Reinaldo J. Gianini, Ieda M.M. Laurindo, and Gilberto S. Novaes - Sources of Discrepancy in Patient and Physician Global Assessments of Rheumatoid Arthritis Disease Activity - The Journal of Rheumatology 2004; 31:7.
2. Harris C. Osteoarthritis: How to diagnose and treat the painful joint. Geriatrics 1993;48:39-46.

The role of obesity in knee osteoarthritis patients

D. Drăgoi, D. Matei, R. Popescu, R. Trăistaru

*Student University of Medicine and Pharmacy Craiova
Rehabilitation Clinic, University County Hospital, Craiova, Romania*

Introduction. Knee osteoarthritis (OA) is a long-term disease for which obesity represents one of the most important risk factors as well as a predictor for progression(1). Medical management is not always effective in reducing pain or improving the mobility. Consequently, this creates a great potential for patient dissatisfaction.

The aim of this study was to determine whether obesity is associated with an increased risk for progression of hip and knee osteoarthritis. **Materials and methods.** A number of patients with knee OA (n:38) were included in this study. The diagnosis of OA was based on the criteria of The American College of Rheumatology (ACR). Demographic data, disease duration (years), body mass index were noted. Index of severity for OA of the knee by Lequesne was used in evaluating the clinical disability of OA and the results of HAQ were noted. **Results.** Compared to the normal weight-patients group, obese patients showed a better correlation between the clinical and functional variables, with a superior predictability where the Lequesne index and HAQ are concerned, in connection to the degree of mobility limitation or pain associated with passive mobilization (R=0,738 and R²=0,545); moreover, the obese-patients group showed a significant correlation with a 60% predictability for determining knee disability expressed by the HAQ questionnaire. **Conclusion.** Compared to participants with a normal BMI, those who were over-weight or obese had an increased risk for clinical and functional status. At the same time, the repercussions of obesity on these patients' life quality are more significant in comparison to the regular weight group.

References

1. Grazio S, Balen D, Obesity: risk factor and predictor of osteoarthritis, Lijec Vjesn. 2009 Jan-Feb;131(1-2):22-6

Bone Mineral Content of the Upper Extremities after Stroke

B. Celik¹, K. Ones¹, N. Ince²

¹Istanbul Physical Medicine Rehabilitation Teaching and Research Hospital, Istanbul-Turkey

²Istanbul University, Istanbul Medical School, Istanbul-Turkey

Introduction. The aim of this study was to compare the bone mineral content (BMC) of the paretic arm versus non affected arm in patients with stroke and to evaluate the effects of time since stroke, spasticity and motor recovery on the BMC. **Materials and methods.** Thirty-five stroke patients with a mean age and standard deviations 62.69±9.54 yrs were included in the study. A full physical examina-

tion including Brunnstrom motor recovery and modified Ashworth spasticity scale was performed. BMC was obtained from the total body scans determined by using dual-energy X-ray absorptiometry (DXA; Lunar DPX-PRO, USA). **Results.** BMC of the non affected and paretic arms were 172.15±57.30 g ve 138.35±58.24 g respectively. BMC was significantly higher in the non affected side than in the paretic side (p=.000). Non significant correlation was found between the BMC of both the paretic and non affected upper extremities and brunnstrom motor recovery of the hand / upper extremity, Ashworth spasticity scale and time since stroke (p>.05). **Conclusion.** The non-affected side BMC seems to be higher than the paretic side in patients with stroke. This could be related to loading of the non-affected side by using cane or tripod resulting in significant increase of bone mineral.

Rankl inhibition as a targeted approach in the treatment of osteoporosis

A. Nardi

SOS Dpt Patologia Osteoarticolare, Azienda ULSS 18 - Rovigo, Italy

Bone undergoes a continuous and balanced remodeling process. An imbalance in this process, which favours bone resorption, results in bone loss and in damage to the skeletal microarchitecture. A new targeted anti-resorptive approach is represented by the inhibition of RANK Ligand (RANKL), which is one of the primary mediators of osteoclast activity, essential for osteoclast formation, function and survival. RANKL exerts direct catabolic effects on cortical and trabecular bone, leading to decreases in bone volume, mineral density and strength. A variety of innovative therapeutic approaches targeting RANKL inhibition are currently under investigation in humans. In randomized, controlled clinical trials, 6-monthly subcutaneous administration of an experimental, fully human, monoclonal antibody against RANKL to women with osteopenia or postmenopausal osteoporosis significantly increased bone mineral density (BMD) at all skeletal sites (including the lumbar spine, femoral neck and distal radius) and decreased markers of bone turnover in a rapid, pronounced and sustained manner. Moreover, in two clinical studies, this therapeutic approach produced significantly greater increases in BMD than alendronate at all measured skeletal sites after 12 months of treatment. RANKL inhibition with this monoclonal antibody has finally been demonstrated to significantly reduce the risk of vertebral (68%), non-vertebral (20%) and hip (40%) fractures in women with postmenopausal osteoporosis after 3 years of treatment. The frequency and pattern of reported adverse events has been similar to placebo or bisphosphonate treatment, suggesting a good tolerability profile. These data suggest that RANKL inhibition offers an additional and innovative therapeutic approach for the treatment of postmenopausal osteoporosis and, on the basis of comparative BMD results, may provide an incremental clinical benefit compared with currently available bisphosphonate treatments.

Percutaneous radiofrequency in the hip osteoarthritis and rehabilitation

C. Mariconda¹, F. Rivera², M. Barbieri¹, G. Annaratone²

¹Struttura Complessa di Recupero e Rieducazione Funzionale, Area Funzionale Ortopedico Traumatologica Riabilitativa.

²Struttura Complessa di Ortopedia e Traumatologia, Area Funzionale Ortopedico Traumatologica Riabilitativa.

Presidio Sanitario Gradenigo, Torino

Introduction. Presence of significant co-morbidities may represent a contraindication to hip surgery. We proposed a conservative approach to hip replacement, using percutaneous radiofrequency (PRF) lesioning of sensory branches of obturator and femoral nerves. **Materials and methods.** An articular branch block test using 3 ml of Ropivacaine was performed under fluoroscopic control. If local anesthesia was effective, PRF was carried out (90° for 90 seconds), using current supplied by the RF generator. For the obturator nerve the needle was inserted by antero-medial approach, while for the femoral nerve the needle was inserted by antero-lateral approach. Precise tip of the needle was verified by electrical stimulation of the target nerve (sensory and motor testing). **Results.** 16 patients (10 females and 6 males, mean age 74±6 years) with chronic hip pain with several contraindications to hip surgery was selected. In most cases the patients obtained pain relief after the procedure. Nearly half of patients reported at least

50% relief of pain at 6 months follow-up. There were no side effects or motor weakness. **Conclusion.** PRF lesioning of the sensory branches of the nerves innervating the hip joint can be an option for patients with intractable hip joint pain and contraindication for hip surgery. We believe that this technique represents a promising opportunity that can be employed in a wider and more articulated rehabilitation project.

References

1. Sei Fukui, Shuichi Nosaka. Successful relief of hip joint pain by percutaneous radiofrequency nerve thermocoagulation in a patient with contraindications for hip arthroplasty. *J Anesth.* 2001;15:173-175.
2. Atif Malik, et al. Percutaneous radiofrequency lesioning of sensory branches of the obturator and femoral nerves for the treatment of non-operable hip pain. *Pain Physician.* 2003; 6: 499-502. ISSN 1533-3159.

Skeletal Muscle Mass of the Upper Extremities after Stroke

B. Celik¹, K. Ones¹, N. Ince²

¹*Istanbul Physical Medicine Rehabilitation Teaching and Research Hospital, Istanbul-Turkey*

²*Istanbul University, Istanbul Medical School, Istanbul-Turkey*

Introduction. The aim of this study was to compare the skeletal muscle mass including lean mass and fat tissue of the paretic arm versus non affected arm in patients with stroke and to evaluate the effects of time since stroke, spasticity and motor recovery on the body composition. **Materials and methods.** Thirty-five stroke patients with a mean age and standard deviations 62.69±9.54 yrs were included in the study. A full physical examination including Brunnstrom motor recovery and modified Ashworth spasticity scale was performed. Fat mass (g) and lean tissue mass (g) of both the paretic and non-affected upper extremities were obtained from the total body scans determined by using dual-energy X-ray absorptiometry (DXA; Lunar DPX-PRO, USA). **Results.** Lean tissue and fat tissue of paretic and non affected arms were as follows: lean tissue paretic 2512.74±747.82 g, lean tissue non affected 2359.06±632.42 g, fat tissue paretic 1694.37±993.94 g, fat tissue non affected 1556.29±891.94 g. Non significant difference was found between the paretic and non-affected sides in terms of lean and fat tissue (p>.05). Non significant correlation was found between the lean tissue and fat tissue of both the paretic and non-affected upper extremities brunnstrom motor recovery of the hand upper extremity, Ashworth spasticity scale and time since stroke (p>.05). **Conclusion.** Stroke does not seem to affect lean and fat tissue of the upper extremities in this study. This could be related to small sample size as well as relatively lower body content of the upper extremities in comparison to lower extremities.

Motor relearning program and observation therapy: Minimal Protocol for Stroke (PMIC) as tool of comparison

L. Perrero, V. Tacchini, O. Garrè, A. Bellora, M. Polverelli

Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy

Introduction. One of the main goal in stroke rehabilitation is to get a standardization of the functional evaluation following the EBM. The base to perform an effective and efficient treatment is to develop the more possible objective protocol of measure using international validated scale. The Minimal Protocol for Stroke (PMIC) is a protocol of functional evaluation composed by international validate scale of measure. The main objective of the project is to diffuse the use of PMIC and create a National Italian Register for Stroke. Other possible positive relapses are about familiar and professional education, research and clinical approach. **Materials and methods.** We have developed a study to evaluate two different approaches in stroke rehabilitation using the PMIC as a tool of comparison. 60 stroke survivors are enrolled and submitted to PMIC evaluation before and after a period of rehabilitation (45-60 days). The population is randomized in 2 groups. Group A receives a treatment called "traditional" based exclusively on "task oriented therapy" referring to the concepts of "motor relearning program"; group B receives a "double treatment", constituted by the "traditional" associated to exercises related with the "action observation therapy." The objective of the study is to verify the efficacy of the two different treatment (traditio-

nal vs double treatment) **Results.** The statistical analysis of the comparison of PMIC scales values in group A and B don't show an evidence of superiority of one of the two treatment except for a better partial functional recovery of the superior limb in the B group. In both of groups we observe statistical meaningful improvements in all parameter evaluated with PMIC scales after the rehabilitation treatment. **Conclusion.** Even considering the modest entity of the number of subjects enrolled the study confirm the international data underlining the effectiveness of an intensive rehabilitation treatment in specific ward for stroke survivors. On the other hand is not possible to assign a real superiority to an approach towards the other. Also these results correspond to international study on stroke rehabilitation confirming there is not a superior rehabilitation technique in comparison to another.

References

- Franceschini M, Paolucci S, Perrero L, Polverelli M, Zampolini M, Giustini A. Stroke Rehabilitation Care in Italy. *American Journal of Physical Medicine & Rehabilitation.* August 2009;88:679-685.
- Ferrara P, Bertolini C, et al. Il protocollo diminima per l'ictus cerebrale (P.M.I.C.) come strumento di valutazione di outcome in un reparto di riabilitazione intensiva postacuzie *Eur Med Phys* 2009;45(suppl.1tono.3).
- Perrero L, Bruni L., Bellora A., Ghidella P.E., Polverelli M. Il protocollo di valutazione diminima per l'ictus (PMIC): utilizzo in riabilitazione intensiva post-stroke. *Eur Med Phys* 2008;44(suppl.1tono.3).

The lateral fracture of brittleness femur: new pharmacological and rehabilitation approach

N. Sala, C. Venza, G. Letizia Mauro

University of Palermo, Unit of Physical Medicine and Rehabilitation

Introduction. Recognized social disease from the World Health Organization, osteoporosis, represents an pathological entity intended to undergo significant increase in the coming years. The osteoporosis prepares to an increased risk of fractures. According to the International Osteoporosis Foundation, the femur fracture is the most serious and crippling complication and has the highest index of mortality at short distance from the event. **Materials and methods.** From April of 2008 to June of the 2009, twenty patient affections from lateral fracture of the femur with elevated index of medical history risk and documented severe osteoporosis with radiological evaluation the vertebral fractures have been enlisted. Eleven of these patients have been submitted to medical therapy with Teriparatide and to a specific rehabilitation program; the remainders nine patient, that could not assume such molecule, they have been submitted to a rehabilitation program and a medical therapy with Calcium and Vitamin D. All the patients, to the entry and the resignation from the department of Fisioterapia, to three, to six, to twelve and eighteen months the following scales of evaluation are been administered: VAS, Barthel, ADL and IADL and Qualeffo. **Results.** From the elaboration of the picked data a picture of satisfactory improvement of the quality of life of the patients is delineated submitted to medical therapy with Teriparatide and rehabilitation treatment than the control group. **Conclusion.** The objective has been that to individualize the most advantageous therapeutic planning that it aimed to confer a accelerated induced to the build bone by the treatment with Teriparatide, offering the possibility of a precocious load, that is translated in a more express and best recovery of the functional autonomy.

References

- Boning Up on Osteoporosis: A Guide to Prevention and Treatment. National Osteoporosis Foundation. 2000.
- Long, J.P., Santner, T.J., Hip resurfacing increases bone strains associated with short-term femoral neck fracture. *J. of Orthopaedic Research*, 2009.

The intraobserver and interobserver reliability of the Compangle, a new goniometer for joint angle measurements of the hand and wrist

A.N.G. van Pruijssen-Romijn, R.W. Selles, T.A.R. Schreuders, H.J. Stam
Department of Rehabilitation Medicine, Erasmus MC, Rotterdam & Rijndam Rehabilitation Centre, Rotterdam

Introduction. The Compangle, a new goniometer, is especially developed to measure mobility of smaller joints such as those in the hand and the wrist. It can be used with one hand and provides a better bone alignment with less skin contact. Previous research has shown a better intraobserver reliability compared to a conventional goniometer for the finger joints in healthy subjects¹. However, it has not been

determined if it can be used to measure mobility of the wrist, which is a difficult joint to measure with goniometry. Aim of this study is to determine the intraobserver and interobserver reliability of the Compangle for wrist flexion and extension and to compare it to the reliability of a conventional goniometer. **Materials and methods.** The active and passive range of motion (flexion/extension) of the dominant wrist of twenty five healthy adults was measured with the Compangle and with a conventional goniometer twice by one tester and once by another tester. The intraclass correlation coefficient (ICC) and the smallest detectable difference (SDD) were calculated. **Results.** For the Compangle, intraobserver and interobserver ICC's varied between, 0.86-0.95 and 0.63-0.83, respectively. SDD's varied between 6,2-8,3 and 10,8-15,3 degrees. Intraobserver and interobserver ICC's of the conventional goniometer were higher, between 0.93-0.98 and 0.72-0.88. SDD's were smaller and varied between 4,4-6,8 and 9,5-15,1 degrees. **Conclusion.** The reliability of the Compangle in joint angle measurements of the wrist is good to excellent but there is a tendency for better reliability of a conventional goniometer.

References

1. H.J. Stam et al. The compangle: a new goniometer for joint angle measurements of the hand. *Europa Medicophyica* 2006;42:37-40.

Quantitative Sensory Testing – a useful tool in the diagnosis of Complex Regional Pain Syndrome

O. Schuhfried¹, M. Herceg¹, G. Vacariu²

¹Department of Physical Medicine and Rehabilitation, Medical University of Vienna

²Orthopedic Hospital Speising, Vienna

Introduction. Quantitative Sensory Testing (QST) is a simple, non invasive method to detect small nerve fibre dysfunction. In CRPS hyperalgesia and allodynia are common complaints. Are there relevant side to side differences in QST in patients with CRPS I and are there differences in the acute and chronic stage of the disease? **Materials and methods.** 70 patients with CRPS I according to the modified IASP criteria (1) were tested. 44 patients were in the acute stage of the disease (<6 mo from the onset), 26 patients in the chronic stage of the disease (≥ 6 mo from the onset). Thermal QST was performed using a Medoc Thermal Stimulus Analyser TSA-2001 device. The probe was placed in the dorsum of the hand or foot. Warm detection threshold (WDT), cold detection threshold (CDT), heat pain threshold (HPT) and cold pain threshold (CPT) were assessed first on the contralateral side and than on the ipsilateral (involved) side. **Results.** In the acute stage of the disease significant side to side differences were found for the **CDT**: ipsilateral: 27.1±5.9°C; contralateral: 29.3±2.0°C (**p=0.019**) and for the **WDT**: ipsilateral: 39.1±5.4°C; contralateral: 36.6±3.5°C (**p=0.001**). The results for the **HPT**: ipsilateral: 46.0±3.3°C; contralateral: 45.7±3.7°C (p=0.721) and **CPT**: ipsilateral 7.8±9.1°C; contralateral: 8.5±9.1°C (p=0.717) were not significant. In the chronic stage of the disease a significant difference was found for the **CDT**: ipsilateral: 25.1±5.6°C; contralateral: 28.4±3.1°C (p=0.009), but not for the **WDT**: ipsilateral: 39.6±4.7°C; contralateral: 38.9±5.0°C (p=0.513) and for the **HPT**: ipsilateral: 45.5±5.0°C; contralateral: 47.1±3.0°C (p=0.244). A nearly significant difference was found for the **CPT**: ipsilateral 11.5±10.8°C; contralateral: 6.1±7.7°C (p=0.072). **Conclusion.** QST may be a helpful tool in the diagnosis of CRPS I. Differences in the acute and chronic stage of the disease have to be taken into account. This may be due to central sensitization.

References

1 Bruehl S et al. External validation of IASP diagnostic criteria for complex regional pain syndrome and proposed research diagnostic criteria. *Pain* 1999; 81: 147-154.

Kinematic analysis of drinking from a glass in a population with tetraplegia

A. De los Reyes-Guzmán, A. Gil-Agudo, A. Del Ama- Espinosa, B. Peñasco-Martín, M. Solís Mozos, E. Pérez-Rizo

Biomechanics and Technical Aids Department. Physical Medicine and Rehabilitation Department. National Hospital for Spinal Cord Injury. SESCAM. Toledo. Spain

Introduction. Kinematic analysis is a valuable instrument for studying the execution of movement during upper limbs functional activities. The aim of this study was to analyze the kinematic differ-

ences in the execution of an activity of daily living such as drinking from a glass between two groups of patients with tetraplegia and a control group. **Materials and methods.** 24 people were separated into three groups for analysis: 8 subjects with metameric level C6 and C7 tetraplegia and 8 control subjects. A set of active markers were positioned on the upper limb and two scanning units were used to record the sessions (CodaMotion). Movement times, velocities, and the joint angles of the shoulder, elbow and wrist were the variables analyzed. Kruskal-Wallis test was used to find differences between the three groups. **Results.** The most relevant differences between the three groups were in the wrist. Wrist flexion during the back transport phase was greater in the patients with C6 and C7 tetraplegia than in the controls (p<0.01), whereas the highest wrist extension values were in forward transport in the subjects with C6 and C7 tetraplegia. **Conclusion.** An exhaustive description was made of the three-dimensional kinematic analysis of the task of drinking from a glass. This was a useful application of kinematic analysis of upper limb movement in a clinical setting. Better knowledge of the execution of this movement in each of these groups allows therapeutic recommendations to be specifically adapted to the functional deficit present.

References

Murphy MA, Sunnerhagen KS, Johnels B, Willen C. Three-dimensional kinematic motion analysis of a daily activity drinking from a glass: a pilot study. *J Neuroeng Rehabil* 2006, 3:18.
Laffont I, Briand E, Dizien O, Combeaud M, Bussel B, Revol M, Roby-Brami A. Kinematics of prehension and pointing movements in C6 quadriplegic patients. *Spinal Cord* 2000; 38(6):354-362.

The effect of hand size on the stimulus intensities required for median and ulnar sensory nerve conduction studies

?????

?????

Introduction. The objectives were to compare supramaximal stimulus intensities required to obtain median and ulnar SNAP, pain scores, and the occurrences of ulnar CMAP interfering ulnar SNAP by using 14cm. standard distances versus proximal wrist crease. **Materials and methods.** 20-30 years old healthy volunteers were recruited. Determined hand size by distance between proximal wrist crease to base of middle finger, divided into 3 groups (small ≤11, medium >11-12, large >12cm.), 12 hands/group. Antidromic median and ulnar sensory nerve conduction studies (SNCS) were performed. The nerves were randomly stimulated at proximal wrist crease and 14cm. from recording electrode. Supramaximal stimulus intensity, pulse duration, peak-peak amplitude, VAS pain score and occurrence of ulnar CMAP interfering ulnar SNAP at each stimulating site were recorded. **Results.** All hands required stimulus intensities at 14cm. greater than at proximal wrist crease except 1 large hand in ulnar SNCS. In small hands, greater increase in supramaximal stimulus intensities (median 8-200%, ulnar 1-194%) was required at 14cm. versus at proximal wrist crease, than in medium and large hands. VAS at proximal wrist crease was less than at 14cm. especially in small hands in both nerves. In all hand size, at proximal wrist crease revealed less ulnar CMAP interfering ulnar SNAP than at 14cm. in which the latency differences between orthodromic and antidromic techniques were up to 0.4 msec. **Conclusion.** Most subjects required greater stimulus intensities at 14cm. than at proximal wrist crease. Especially in small hands, there were greater increases in VAS with more occurrences of ulnar CMAP interfering ulnar SNAP at 14cm. This study demonstrated the effect of hand size on selecting proper individualized stimulation site.

References

Srisawadi G, Thanakiatpinyo T. The effect of hand size on the stimulus intensities required for median and ulnar sensory nerve conduction studies. *Arch Phys Med Rehabil.*

Protocollo di minima per l'ictus cerebrale (PMIC) – a protocol for the evaluation of the outcome and the rehabilitative care of stroke patients: experience of the cesena rehabilitative medicine unit

P. Fornasari, S. Montanari, G. Teodorani
Rehabilitation Unit, Department of Neuroscience, Azienda USL, Cesena (Italy)

Introduction. The Protocollo di Minima per l'Ictus Cerebri (PMIC) (1) has been introduced in our clinical practice for stroke

for over four years. **Materials and methods.** PMIC was administered following the protocol, whereby the forms relative to the inpatient rehabilitative phase were completed at the admittance and discharge of patients to the intensive care rehabilitation ward and the form for the outpatient rehabilitative phase used at the 12 month follow-up. **Results.** 42 patients were assessed, 25 males and 17 females with a mean age of 64.3 years (SD 11.1). 28 patients had ischemia (TACI 2, PACI 16, LACI 5, POCI 5) and 14 haemorrhages (10 supratentorial; 3 infratentorial; 1 wide). The mean time between the stroke and admission in intensive rehabilitative care was 16.8 days (SD 8.1). The average pre-morbid Rankin score was 0.26; at admission it was 4.45 with a median of 5; at discharge it was 3.16 with a median of 3. The average score for the Canadian Neurological Scale at admission was 6, the median was 5.5; at discharge the average value was 8.14 with a median of 8.25. At follow up the average value was 8.98, the median was 9. 41 patients from the study were discharged home, while one patient was transferred to another Rehabilitative Intensive Care Unit. At follow up, 41 patients were still at home, 1 patient was deceased. 90.5% of patients regularly go out from home. 22 patients followed outpatient rehabilitative treatment, 7 home-based rehabilitative treatment and 2 in day hospital. **Conclusion.** In our experience, the PMCI was found to be an easy evaluation tool, useful for monitoring the short and long-term rehabilitative care and outcome of patients from our Rehabilitation Unit.

References

1. Franceschini M, Paolucci S. Basic assessment of stroke. Protocollo di minima per l'ictus cerebrale (PMIC). Eur J Phys Rehabil Med 2008;44:100-1.

Comparison of nerve conduction studies to clinical findings in the diagnosis of neuropathy of the ulnar nerve at the elbow

V. Aggeli, V. Doulias, I. Sioutis, N. Roussos, C. Goumas, V. Mitsis, D. Patatoukas

PRM Department, "Asklepieion" General Hospital, Voula Greece

Introduction. Ulnar nerve compression at the elbow is frequently encountered as the second most common entrapment neuropathy of the upper limb. This study is aimed to evaluate the importance of electrodiagnostic studies in patients with ulnar nerve neuropathy. **Materials and methods.** Fifteen patients (mean age 52.9 +/- 7.8 years, 7 men and 8 women) were evaluated. Electrodiagnostic studies were performed for the symptomatic and the asymptomatic contralateral arm. According to the symptoms and clinical findings (grip, pinprick sensation Froment's test Pollock's test Tinel's sign) the patients were assigned to three groups (mild, moderate, and severe). Electrophysiological measurements for each stage were compared with one another. **Results.** In the 15 symptomatic arms the mean values for motor nerve conduction were: For the mild group of nerve compression conduction velocity (MNCV) = 43.2±11.6 m/s; velocity change above-to-below-elbow segment = 11.8±7.7 m/s. For the moderate group of nerve compression the mean values are: MNCV = 42.2±11.7; velocity change MNCV = 12.9±5.9; For severe nerve compression :MNCV = 40.1±10.8; change MNCV = 13.2±8.3. The difference for each parameter between the symptomatic and asymptomatic contralateral arm was statistically significant (p < 0.05). In moderate stage group there was only a significant difference for MNCV between two arms and there was no significant difference between the moderate and the severe group. In our study the calculated sensitivities for the electrodiagnostic studies were 49% for the mild group, 64% for the moderate group, and 83% for the severe nerve compression group. In all patients the MNCV was the most sensitive parameter. **Conclusion.** Electrodiagnostic studies were only able to reveal 3/4 of all patients with an affection of the ulnar nerve and only 2/3 of the patients of the moderate group of ulnar nerve compression.

Health Status and Disability in Women with Breast Cancer related Lymphoedema

T. Di Gregorio, V. Candoli, M.V. Filippi, G. Attisani, V. Gessaga, E. Bottura, G.A. Magagni, R. Galassi

Hospital of Rimini, U. O. of Physical Medicine and Rehabilitation.

Introduction. Arm lymphedema is one of the most disabling complications in women after breast cancer surgery (1). The purpose of the present study was to apply the "Ricci's disability index" (2) in

order to verify its ability to assess the 'disability' of women and to determine whether it correlates with FIM. **Materials and Methods.** 18 women, mean age 53,5, underwent breast surgery (10 quadrantectomy, 8 mastectomy) and affected by arm lymphoedema were assessed using 'Ricci's disability index' and FIM. **Results.** According to the scores obtained from 'Ricci's disability index' 5 women (27,8%) displayed no disability, 7 (38,9%) mild, 5 (27,8%) moderate, 1 (5,5%) severe and 0 showed complete disability. All women in the group showed disability regarding the item "Objects lifting and carrying", 6 had problem with "Fine hand movements", 7 with "Means of transportation use", 5 with "Washing", 9 with "Body care-Dressing", 11 with "Meal making", 13 with "House chores"; 12 women encountered difficulties during interactions with unknown people, 6 with family members, 9 during sexual activity, 11 in job setting, 12 during leisure activities. Only few FIM items showed the need of some assistance: Dressing Upper (1 woman)- Lower (2) body and Social Interaction (2). It highlighted an increase in performance time of Dressing Upper (7)- Lower Body (6). **Conclusion.** Results suggest that Ricci's disability index is a sensible instrument in identifying lymphoedema related disability compared to FIM which shows low sensitivity and specificity.

References

1. Swensson KK et al. 'Case-control study to evaluate predictors of lymphedema after breast cancer surgery' Oncol Nurs Forum.36(2):185-93. Mar 2009.
2. Ricci M.: Proposal of Disability Scale for Oedema. The European Journal of Lymphology.19:21-3.2008.
3. Tsai RJ et al. The Risk of developing arm lymphedema among breast cancer survivors: a meta-analysis of treatment factors. Ann Surg Oncol Apr 14.2009.

Predictors of weight change in cardiac rehabilitation patients

S. Pimentel¹, J.A. Rocha^{1,2}, A.I. Silva^{1,2}, V. Araújo³, J. Maciel³, F. Parada¹

¹Department of Physical Medicine and Rehabilitation, São João Hospital, Porto, Portugal

²Cardiac Rehabilitation/Exercise Training Unit, Department of Physical Medicine and Rehabilitation, São João Hospital, Porto, Portugal

³Department of Cardiology, São João Hospital, Porto, Portugal

Background. Overweight and its consequences are associated with increased cardiovascular disease morbidity and mortality. Weight loss significantly contributes to improvement in overall cardiac risk factor profile both in primary and secondary prevention of coronary heart disease. **Objective.** To identify predictors of weight change during a hospital-based phase II cardiac rehabilitation program in coronary patients. **Materials and methods.** Prospective cohort study of 119 patients who completed a formal phase II cardiac rehabilitation program within 3 months after acute coronary syndrome recruited between September 2008 and December 2009. Data regarding anthropometric, clinical, laboratorial and functional response was collected at baseline and program completion. Psychosocial profile and quality of life were assessed using patient health questionnaire (PHQ-9) and short-form 36 (SF-36), respectively. Univariate linear regression was used to identify predictors of weight change during CRP. **Results.** We analyzed 119 patients who completed a mean of 14,92 (4,32) exercise sessions. They were mostly men 108 (90,8%), had low-levels of education with 61 (51,7%) having studied less than 4 years. Indications for cardiac rehabilitation were ACS submitted to either percutaneous revascularization 106 (89,1%), coronary artery bypass surgery 3 (2,5%) or medical treatment 10 (8,4%). Mean weight loss and mean BMI reduction was 0,73 (2,56) kg and 0,27 (0,93) kg/m², respectively. Body composition showed 1,13 (2,91) percent reduction in fat mass and 0,45 (1,16) percent increase in lean body mass. Independent predictors of weight loss were level of education (b=0,25; p<0,001), smoking status at program entrance with quitters (b=-0,35; p<0,001) and persistent smokers (b=-0,27;p<0,05) showing more adverse weight response to CRP. Severity of depressive symptoms negatively influenced weight reduction, as expressed by the PHQ-9 (b=-0,10; p=0,001) with major depression (PHQ-9 ≥10) having an even higher impact (b=-1,55; p<0,001). Total energy expenditure during training session maximized weight improvement (b=0,20; p<0,05). **Conclusion.** Weight reduction is a reflection of adherence to both dietary and physical activity recommendations in secondary prevention programs, hence its dependency on level of education, smoking status and estimated energy expenditure during physical activity. Weight change is also negatively influenced by psychological factors, mainly depression. Identifying factors associated with poorer weight

response might allow early more individualized interventions such as more aggressive low-calorie high-expenditure combinations and psycho-behavioural interventions. Further studies are needed to evaluate the impact of such interventions.

The influence of cardiovascular procedure type and postoperative complications on 6 minutes walking test (6MWT) in patients subjected to cardiologic rehabilitation

M. Mackiewicz-Milewska^{1,2}, A. Hoffmann¹, A. Kaszewska¹, P. Guzik³, A. Glama¹, H. Mackiewicz-Nartowicz⁴, D. Fabrowski¹

¹Department of Cardiology and Cardiologic Rehabilitation, Municipal Hospital in Bydgoszcz

²Department of Rehabilitation, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University

³Department of Cardiologic Intensive Care and Internal Diseases, Medical University in Poznań

⁴Department of Phoniatriy and Voice Rehabilitation, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University

Introduction. The aim of our study was the estimation of selected cardiosurgical complications and kind of cardiosurgical procedure on the 6MWT in patients rehabilitated due to cardiac surgery. **Materials and methods.** Our material covers 87 patients at a mean age of 72. All the patients had an early rehabilitation done after the cardiac operations. Patients who had a 6MWT performed in the beginning and at the end of rehabilitation programme were included into research. The kind of operation, 6MWT results, postoperated FA, pleural and pericardial effusion, and toracotomy wound healing by second intention were estimated. **Results.** Patients with pleural effusion had a 6MWT distance before the rehabilitation beginning significantly shorter (297,5±82,9 vs. 344,4± 88,0 m; p = 0,027), and it remained shorter after the end of rehabilitation (418,8 +/- 88,2 vs. 460,1±91,7 m; p = 0,060). Patients with wound healing by second intention got a significantly shorter distance in 6MWT after the end of rehabilitation (363,3±81,2 vs. 455,0±90,2 m; p = 0.023). Patients with CABG and aortic valve replacement procedures appeared more frequently pericardial (OR: 10,35; 95% CI: 1,1-97,3; p = 0,041) and pleural effusion (OR: 5,45; 95% CI: 1,2-24,9; p = 0,029) what was statistical significance. **Conclusion.** Postoperative complications like pleural effusion and sternal pathology considerably limit the effectiveness of cardiologic rehabilitation. The prosthetic valve replacement with CABG increase the risk of postoperative complications subformam pleural and pericardial effusion .

References

1. Fiorina C et al. The 6-min alking test early after cardiac surgery. References values and the effects of rehabilitation programme. *European Journal of Cardio-Thoracic Surgery* 2007,32,724-729.
2. Eder B et al. Early 4-week cardiac rehabilitation exercise training in elderly patients after heart surgery. *Journal of Cardiopulmonary Rehabilitation and Prevention*, 2009,25.

Urodynamic findings in patients with traumatic brain injury

Murat Ersoz, Kurtulus Kaya, Selami Akkus, Sumru Ozel
Ankara PMR Training and Research Hospital of Ministry of Health, Ankara, Turkey

Introduction. Neurogenic lower urinary tract dysfunction is frequent in patients with traumatic brain injury (TBI) and it has negative effect on their quality of life. The aim of this study was investigation and analysis of urodynamic findings in TBI patients. **Materials and methods.** Thirty patients (25 male, 5 female) with TBI who had neurogenic lower urinary tract dysfunction were investigated. Urodynamic examinations were performed by Libra+ (MMS, Enschede, The Netherlands) urodynamic measurement system and by using double lumen 8 F steril urethral catheters. Sterile serum physiologic at room temperature was filled continuously at a filling rate of 50 ml/min and maximum cystometric capacity, residual urine, presence of storage dysfunction (bladder capacity<300 ml) and emptying dysfunction (residual urine>50 ml), and presence of bladder filling sensation, type of detrusor and bladder emptying method were determined. Descriptive statistics were carried out. **Results.** Mean age was 31.9±16.3 years, mean maximum cystometric capacity was 228±155 ml. Postvoid residual urine was present in 15 of the patients and mean residual urine was 128±143 ml. Bladder filling sensation was normal in 16(55.2%), diminished in 11(36.7%) and

was absent in 2(6.7%). Frequencies of storage and emptying dysfunctions were 20(66.7%) and 8(26.7%) respectively. Three (10%) of the patients had normoactive, 23(76.7%) had overactive and 4(13.3%) had underactive detrusors. Twenty-five (83.3%) of the patients were emptying their bladder spontaneously, 4(13.3%) by intermittent catheterization and 1(3%) by indwelling catheter. **Conclusion.** Bladder storage dysfunction is frequent in patients with TBI which is mainly due to detrusor overactivity. Bladder filling sensation is present at least to some degree in the great majority of them and again a great majority of the patients are able to void spontaneously.

Metabolic syndrome patients – primary care can be more than usual care

C. Avram¹, S. Iurciuc², L. Craciun², A. Avram², M. Iurciuc², C. Ciulacu², D. Gaita²

¹Physical Education and Sport Faculty, West University Timisoara, Romania

²Victor Babes University of Medicine and Pharmacy, Timisoara, Romania

Introduction. Metabolic syndrome (MS) is related to cardiovascular risk factors that appear to promote the development of atherosclerotic cardiovascular disease and insulin resistance associated with visceral obesity. Previous studies have shown that MS is one of the risk factors for future cardiovascular events. Preventive measures are the main intervention in order to improve risk factors profile in MS patients.¹ The aim of this study was to evaluate the benefit of an intensive prevention programme conducted by general practitioners (GP), in metabolic syndrome patients. **Materials and methods.** We conduct a prospective study of 18 months on 133 voluntary patients (age 55.6±8.3 years old, 65% women). The inclusion criteria were patients diagnosed with MS using the NCEP-ATPIII criteria.² After a baseline clinical and biological evaluation, GP's reinforced the recommendation regarding lifestyle changes and readjusted the medication according to ESC prevention guidelines (2007). Patients were followed-up by GP's every 6 months. **Results.** Using the paired t test to compare the data at baseline and after 18 months, we noticed significant improvement of the cardio-metabolic risk factors: Waist circumference decreased from 101.1 to 98.6 cm, P=0.002; Systolic/Diastolic blood pressure decreased from 147/85 to 135/76 mmHg, P<0.0001; Total cholesterol decreased from 213 to 203 mg/dL, P=0.006; LDL cholesterol had the same positive evolution (decreased from 131 to 119 mg/dL, p=0.0006). Despite lifestyle changing recommendations and medication, the improvements in HDL cholesterol, Triglycerides and Glycaemia did not reached the statistical significance (p<0.05). **Conclusion.** 18 months primary prevention programmes improves cardiovascular risk factors in metabolic syndrome patients. Cardiovascular prevention programmes conducted by GP's are efficient, especially if the doctors are trained to follow the guidelines recommendations and encouraged to focus on cardiovascular risk reduction.

References

1. European Guidelines on cardiovascular disease prevention in clinical practice. *European Heart Journal* (2007) 28, 2375–2414.
2. Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. *JAMA* 2001; 285:2486-2497.

Endurance training and physical fitness in young metabolic syndrome patients

C. Avram¹, M. Oravitan¹, A. Nagel¹, L.D. Hoble¹, A.M. Rusu², R.G. Dragoi², C.A. Avram²

¹Physical Education and Sport Faculty, West University Timisoara, Romania

²Victor Babes University of Medicine and Pharmacy, Timisoara, Romania

Introduction. Metabolic syndrome (MS) is a cluster of cardiovascular risk factors including high blood pressure, dyslipidemia, hyperglycemia, and central obesity.¹ An important role in MS treatment is played by the lifestyle intervention including increase in physical fitness.² The study is aiming to evaluate the endurance training benefit on physical fitness in young metabolic syndrome patients. **Materials and methods.** We conduct a randomized prospective study of 6 months on 27 voluntary students, previously diagnosed with MS using ATP-III criteria. All patients were evaluate through a cardiopulmonary exercise testing (CPET) at inclusion and

after 6 months. The CPET results were used to provide optimal recommendation for exercise intensity in order to improve endurance and increase the VO_2 peak. The patients benefit from an intensive exercise training programme supervised and guided by a personal trainer. Exercise recommendation consisted in 3 times per week of 60 minutes at extensive and intensive endurance training zone (in the range of anaerobic threshold), completed by 1 minute interval in the range between anaerobic threshold (AT) and respiratory compensation point (RCP), for every 5 minutes of training. **Results.** After 6 months of training we noticed a significant improvement in physical fitness: Oxygen uptake (VO_2) at AT increased from 1.19 to 1.55 L/min, $P < 0.0001$; VO_2 at RCP increased from 1.66 to 1.96 L/min, $P = 0.0003$ and VO_2 peak increased from 1.9 to 2.13 L/min, $P < 0.0001$. We also noticed an increase of the oxygen pulse (VO_2/HR – an important indices of cardiac performance in exercise) from 10.3 to 11.7 mL, $P < 0.0001$. **Conclusion.** Six months endurance training programme improves physical fitness in young metabolic syndrome patients. Supervised endurance training is particularly needed, at least in the beginning of an intensive lifestyle intervention, in order to get quick results and increase the patient motivation and compliance to exercise.

References

1. Ryden L, Standl E, Bartnik M, et al. Guidelines on diabetes, pre-diabetes, and cardiovascular diseases. *European Heart Journal* 2007;28:88-136.
2. Gaita D, Avram A, Avram C. Antrenamentul fizic in recuperarea cardiopulmonara, Ed. Brumar, Timisoara, Romania, 2007.

Assessment of the severity of the autonomic lesion in spinal cord injury patients

J.G. Prevaire, P. Rigaux, V. Leclercq, J.M. Soler

Spinal Department, Centre Calvé, Fondation Hopale, Berck sur mer, France

Introduction. In spinal cord injury patients (SCI), we aimed: to assess the integrity of the descending autonomic pathways, by studying both sympathetic cholinergic (sudomotor) and adrenergic (cardiovascular) functions; to assess the presence of an isolated spinal cord, i.e. a sympathetic spinal cord segment that has lost supraspinal control; to correlate the severity of the somatic complete lesion (AIS A) with the severity of the autonomic lesion. **Materials and methods.** Chronic SCI patients with a complete somatic lesion above T6 were proposed to take part in the study. They took a battery of autonomic tests including pressor tests above and below the lesion (mental arithmetic, hand and foot cold, electrical abdominal stimulation), respiratory challenges (Valsalva Manoeuvre), and sympathetic skin responses (SSR) with electrical stimulation above the lesion. **Results.** 23 consecutive traumatic SCI patients were enrolled (12 tetraplegic and 11 paraplegic patients) in 2009. They all presented with an upper motor neuron lesion, and had history of autonomic dysreflexia. A sudomotor isolated spinal cord was found in all patients, as feet SSR were abolished in all; hands SSR were absent in all tetraplegics and 4 paraplegics. An adrenergic isolated spinal cord was found in 20 out of 23 patients, as pressor tests below the lesion (cold foot, abdominal electrical stimulation) evoked a significant rise in systolic blood pressure (with or without autonomic dysreflexia) in 20 patients. Valsalva manoeuvres were abnormal in all but 1 paraplegic patient. **Conclusion.** Complete somatic (AIS A) SCI is associated with total loss of supraspinal control on descending autonomic pathways in the majority of patients. A battery of tests is needed to assess both cholinergic and adrenergic sympathetic pathways.

References

- Mathias CJ, Frankel HL. Autonomic disturbances in spinal cord lesions. In: Bannister, R., Mathias, C.J. (Eds.), *Autonomic Failure*. Oxford University Press, Oxford, 2002.

Rehabilitation treatment patients with osteoarthritis. Own experiences.

L. Raczko, M. Lyp, A. Ogonowski, R. Kaczor

College of Rehabilitation in Warsaw

Introduction. Osteoarthritis (osteoarthritis) concerns every anatomical structures of the joint, bones, periarticular tissues and often abarticular structures. It leads to degeneration of the articular cartilage. There is also an inflammatory state and a pain associated with it. In this times it is a medical, social and economical problem, so it is extremely important to learn more about it and to increase effie-

ciency of methods which is treated by. **Materials and methods.** There was 44 patients included in the study. The group represented varied types of osteoarthritis. Subjects were treated by the methods of physiotherapy program of ATTIS Medical Centre in Warsaw, which contains the classical therapeutic exercises, physiotherapy procedures and massage. The level and the frequency of pain was estimated after the 3, 4 and 5-week lasting therapy. The correlation between the results and age, time of treatment, type and intensity of the pain was checked. In addition the changes of frequency of painkillers taking and the social activity was measured after rehabilitation. Modified VAS Scale and Laitinen questionnaire were used in that purpose. **Results.** Rehabilitation in ATTIS Medical Centre affected decreasing the pain feelings. Also there was noted that frequency of pain was lower after the therapy. There was low correlation between age and pain level but there was a high correlation between the pain level and the chronic and acute pain. The frequency of taking the analgetic drugs was decreased and the social activity was increased after rehabilitation. **Conclusion.** Rehabilitation treatment which was carried out according to program of ATTIS Medical Centre took positive effect of pain reduction in studied group. Classical physiotherapeutic exercises and procedures are effective in struggle with pain in osteoarthritis.

References

1. Balint G, Szebenyi B. Non-pharmacological therapies in osteoarthritis. *Baillieres Clin Rheumatol.*, 1997;11(4):795-815.
2. Cimbiz A. i wsp.. The effect of combined therapy (spa and physical therapy) on pain in various chronic diseases. *Complement Ther Med.*, 2005, 13(4):244-50.
3. Snibbe JC, Gambardella RA. Treatment options for osteoarthritis. *Orthopedics*, 2005;28(2 Suppl):215-20.

Effectiveness of active rehabilitation camps in case of children with myelomeningocele

J. Cieplińska, M. Lyp, R. Kaczor, A. Ogonowski

College of Rehabilitation in Warsaw

Introduction. Disability of the child with myelomeningocele is reflected in almost all aspects of its life, mainly due to the impairment of functional activities. The purpose of this study was to assess the level of improvement of functional performance of children with myelomeningocele in connection with the applied active rehabilitation's techniques. **Materials and methods.** The study group consisted of 30 randomly selected children, aged 8-16 years, diagnosed for myelomeningocele, who participated in camps organized by the Foundation for Active Rehabilitation. For the purposes of this study there was performed a comparative analysis of the results obtained from questionnaires filled by the therapists who conducted trainings for the children on the active rehabilitation camps and the parents (guardians) of these children. The scope of the survey covered a total of 28 activities of daily living, grouped into 5 categories such as "ability to overcome architectural barriers", "locomotion - riding technique", "self-service", "care - hygiene", "social adaptation - involvement in trainings at camps". **Results.** The biggest progress has been observed in the case of activities classified to the categories "the ability to overcome architectural barriers" and "locomotion - riding technique", with the exception of the entry on the stairs, which requires from the child a higher level of functional performance because of the difficulty of performance. On the other hand, the least improvement was recorded in the category "self-service" – it was due to the fact that some of the children already presented a satisfactory level of skills before the active rehabilitation camp. **Conclusion.** In case of the children with myelomeningocele active rehabilitation technique significantly affects the children's skills and efficiency and, consequently, their independence from the support of third parties.

Quality of life of patients with lumbar disc hernia treated conservatively versus surgically treated cases

M. Cevei, D. Stoicanescu

*University of Oradea, Faculty of Medicine and Pharmacy; Medical Rehabilitation Clinical Hospital Felix Spa
University of Medicine and Pharmacy, Timisoara, Romania*

Introduction. The aim of this study was to evaluate patients with low back pain due to lumbar disc hernia, comparing cases that were treated conservatively versus surgically treated cases. **Materials and methods.** We performed a prospective randomized study on 253

cases with low back pain with or without radiculopathy that were treated in the Rehabilitation Clinical Hospital of Baile Felix, between October 2008 - May 2009. All subjects were diagnosed by MRI examination, which confirmed the clinical diagnosis of low back pain by lumbar disc hernia. We divided the study group into two lots: lot I included 130 cases (57.69%) with lumbar pain of disc etiology and lot II consisted of 123 patients (44.23%) that were surgically treated, but still had back pain +/- residual radiculopathy. **Results.** To highlight the impact of the lesion on functionality and daily activities we have relied on indices of assessment of pain and its subsequent disability: Oswestry questionnaire. Average Oswestry score of 54.36% in lot I and 48.43% in the second revealed a severe disability present in both groups. **Conclusion.** 1. Quality of life of patients with lumbar disc hernia is affected largely due to pain, restriction of activity and of social life. 2. Low back pain due to lumbar disc hernia affects the well being status due to severe disability. 3. Deficits for the items investigated with Oswestry score in cases with disc hernia conservatively treated were not significantly statistically different from those with surgical treatment.

References

Fritz JM, Irrgang JJ. A comparison of a modified Oswestry low back pain disability scale; *Physical Therapy* 2001;81:776-778.
 Häkkinen A, Kautiainen H et al. Changes in the total Oswestry Index and its ten items in females and males pre- and post-surgery for lumbar disc herniation: a 1-year follow-up. *Eur Spine J.* 2007;16(3):347-352.

Pathology of lumbar spine in women aged between 40-50 years

D. Stoicanescu, M. Cevei

*University of Medicine and Pharmacy, Timisoara, Romania
 University of Oradea, Faculty of Medicine and Pharmacy; Medical Rehabilitation Clinical Hospital Felix Spa*

Introduction. The aim of this study was to highlight the impact on quality of life in patients with the diagnosis of low back pain due to lumbar discopathy and osteoporosis, in women aged between 40-50 years, in full professional and social activity. **Materials and methods.** We performed a prospective randomized study on 240 women aged between 40-50 years with low back pain due to lumbar discopathy or osteoporosis that were treated in the Rehabilitation Clinical Hospital from Baile Felix between October 2008 - October 2009. We divided the patients in 2 groups: group I included 126 cases (52.5%) with back pain ± residual radiculopathy of disc etiology confirmed by MRI, group II consisted of 114 cases (47.5%) with a diagnosis of vertebral osteoporosis certified by DXA. **Results.** We evaluated life quality of patients in group I with MOS SF-36 questionnaire. Average SF-36 score was 53.67 ± 17.5 points, ranging between 36.14 and 71.2, representing a loss of 46.3%, almost 1/2, revealing a severely impaired quality of life. Evaluation of life quality of patients from group II has been made using Qualeffo-41 questionnaire. Qualeffo 41 total average score of 49.82, revealed a loss at 1/2 of the quality of life. **Conclusion.** The study demonstrated the importance of knowing the influence of discopathy and osteoporosis on quality of life, with a predictive role on the evolution and treatment, which can only be of benefit for medical practice.

References

1. Lips P, van Schoor NM: Quality of life in patients with osteoporosis. *Osteoporos Int* 2005,16:447-455.
 2. Fritz JM., Irrgang JJ.: A comparison of a modified Oswestry low back pain disability scale"; *Physical Therapy* 2001;81:776-778.
 3. Mariana Mihailov, Mariana Cevei: „Recuperarea funcțională în boli reumatice”: Editura Universității din Oradea, 2006

Combined stabilization and straightening exercise program for chronic low back pain

A. Stankovic, M. Lazovic, M. Kocic

Clinic for Physical Medicine, Rehabilitation and Prosthetics, Clinic Center Nis, Serbia

Introduction. Chronic low back pain (CLBP) is widespread health problem and demands multidisciplinary approach. Segmental lumbar stabilization exercises in combination with strengthening and stretching of lower back muscles, form protective lumbar corset which improves stability of the lumbar region, followed by pain and functional disability reduction. **Materials and methods.** The randomized controlled trial was conducted from January 2007. until December 2008. 160 patients with CLBP had two types of exercises.

Control group (CG) had a traditional program (Reagan-Michel). Study group (SG) had combined stabilization and strengthening exercise program for low back pain. Therapy was arranged in 20 sessions during 4 weeks, 30 min. each. For evaluation, SF-36 and Oswestry Disability Score (ODS) were used. Statistical analysis was conducted using MS Excel program for the table and graphical display of data, and the calculations were carried out with the SPSS, version 15.0. **Results.** ODS revealed significant functional recovery in study group: from 34.28% before therapy down to 23.44% at the end. In control group ODS was reduced from: 38.10% to 32.83%. Student's t-test showed that the improvement of functional status in the study group was highly statistically significant compared to control group (t-test (s) = 12.27, t-test (k) = 6.10, p <0.001). Improved functionality and pain reduction induced positive feelings to occur more often, opposite to negative ones, which was determined by strong positive correlation between ODS and SF-36 (questions 38-54). **Conclusion.** Stabilization exercises in combination with strengthening and stretching of lower back muscles, proved to be efficient in reducing pain, increasing mobility and improving overall quality of life.

References

1. Bair M, Robinson R. Depression and pain comorbidity. Review art. *Arch Inter Med* 2003;163:2433-45.
 2. Hayden, JA, van Tulder, M. W., Malmivaara, A. V., Koes, B. W. Meta-Analysis: Exercise Therapy for Nonspecific Low Back Pain. *Ann Internal Med* 2005,142:765-75.

Nerve conduction tests in fibromyalgic patients – a prospective study with healthy controls

A. Lima, D. Leonardo, C. Afonso, A.C. Sousa, L. Gonçalves

Centro de Medicina de Reabilitação do Alcoitão

Introduction. Fibromyalgia (FM) is a common chronic pain condition (2-4% of the population)¹ characterized by diffuse musculoskeletal pain, tender points in characteristic locations and symptoms as fatigue². It is often associated with negative consequences in participation in daily activities¹. Despite improved recognition and understanding, the exact mechanism underlying FM remains obscure³ and lacks adequate data on electroneurophysiologic evaluation of the peripheral nervous system (PNS). The goal of this study is to compare this evaluation in FM patients and healthy controls. **Materials and methods.** Nerve conduction studies were performed in women between 40 and 70 years old: 31 fibromyalgic patients (fulfilling the American College of Rheumatology criteria for FM) and 59 healthy controls. Statistical analysis used parametric and non parametric tests (PASW Statistic 18). Were analyzed: sex, age, motor and sensory nerve conduction of median, ulnar and radial nerves and F waves of ulnar nerve. **Results.** We found statistically significant differences between the two groups (p<0,05) regarding motor latency of median nerve, sensory conduction velocities and latencies of median, radial and ulnar nerves and F waves of ulnar nerve. **Conclusion.** Patients with FM presented higher conduction velocities and lower latencies, most significant in studies dependent on sensory conduction. These results may help to understand the pathophysiologic mechanisms of FM and may indicate that nerve conduction tests could be of value in the assessment of patients with FM and be used as an additional diagnosis tool.

References

1. Gerdtle et al. Firing rate and conduction velocity of single motor units in the trapezius muscle in fibromyalgia patients and healthy controls, *Journal of Electromyography and Kinesiology*, 2008,18:707-716.
 2. Casale et al. Central motor control failure in fibromyalgia: a surface electromyography study, *BMC Musculoskeletal Disorders*, 2009,10:78-86
 3. Ersoz et al. Nerve conduction tests in patients with fibromyalgia: comparison with normal controls, *Rheumatol Int*, 2003,23:166-170

Behavioral and Cognitive Functioning after Traumatic Brain Injury

A. Cavina², A. Cantagallo¹

¹*Modulo di Neuropsicologia Riabilitativa, UOMR,*

²*Dipartimento di Neuroscienze/Riabilitazione, Ospedale ed Università di Ferrara, Italy*

Introduction. The quality of playing in open skill sports, like soccer, mainly depends on the perceptual and cognitive abilities of the athlete as well as on physical and motor skills. The main aims of this pilot study are: to improve our knowledge regarding basic

cognitive abilities of expert soccer players; to enhance our understanding of the role of rapid planning and execution of movements in training and rehabilitation of professional athletes.

Materials and methods. In the first part of the study, we examined the differences between a group of 10 expert soccer players and a group of 10 sedentary people, using a battery of neuropsychological attention tests generally used in clinical field. In the second part, we studied the reaction times and the duration of a rapid isometric contraction in response to a target. We performed variance analysis to one and more factors to evaluate any differences between the groups examined. **Results.** Clinical assessment showed significant differences only for divided attention. Expert soccer players are faster in a dual-task, both through auditory canal ($p = 0.03$) and through visual canal ($p = 0.02$). Multifactor ANOVA, performed on the parameters of isometric contraction, demonstrated that expert soccer players have a higher speed of isometric contraction ($p = 0.004$) in reaching a target. **Conclusion.** Some of the neuropsychological tests used in the pilot study evidenced sensitivity and specificity problems in relation to the required task: only dual task in divided attention showed a better performance in the professional athletes. Finally, the shortest isometric contraction time found in the expert group would suggest a shorter planning phase of motor gesture, but further studies are needed. These two important results should be considered when implementing training and rehabilitation programmes for soccer athletes.

Theory of Mind in patients following Traumatic Brain Injury

A. Geraci¹, L. Surian^{1,2}, M. Ferraro³, A. Cantagallo⁴

¹Department of Cognitive Sciences, University of Trento, Italy

²Centre for Mind-Brain Studies (Cimec), University of Trento, Italy

³Rehabilitation Unit, General Hospital-University of Padua, Italy

⁴Department of Neuroscience/Rehabilitation, Hospital-University of Ferrara, Italy

Introduction. One possible explanation for the difficulties that Traumatic Brain Injury (TBI) patients have in social interaction and communication may be the result of an acquired impairment in representing and reasoning about mental states, and belief-desire reasoning, for short “Theory of Mind” (ToM). Previous studies on TBI patients have proposed that the prefrontal cortex plays a fundamental role in Theory of Mind. **Materials and methods.** All patients had at least 11 months post trauma or surgery, except one who had 5 months post trauma. The time after onset ranged from 5 to 288 months ($M = 34.72$, $SD = 64.93$) and the days of unconsciousness ranged from 1 to 60 ($M = 14.72$, $SD = 13$). The inclusion conditions for patients were: a) a Level of Cognitive Functioning (LCF) of 7 (Automatic, Appropriate Response) of 8 (Purposeful, Appropriate Response); b) an equivalent global score on the WCST equal to or greater than 2 (absence of disorders of executive functions). In the present study, we compared the performance of brain-damaged patients with a pre-dominantly focal injury in the ventromedial ($n=11$) or dorsolateral ($n=7$) prefrontal cortex on two well-known theories of mind tasks, adapted to adult age, one requiring mental state recognition from faces (the Eyes test) (1), and the other requiring inferences about others’ mental states (Faux-pas test) (2). **Results.** We found that both groups of patients performed equally poorly on the former, but only patients with ventromedial lesions performed poorly on the latter. **Conclusion.** These results provide support for theories that claim a fundamental role of the ventromedial cortex in mental state reasoning. The Authors describe two rehabilitation programmes, one for emotion recognition and one other for mental state reasoning.

References

1. Baron-Cohen S, et al. Journal of Child Psychology and Psychiatry, 2001;42: 241-251.
2. Baron-Cohen S, et al. Journal of Autism Developmental Disorders, 1999;29: 407-418.

Analysis of the measurement properties of PMIC (“protocollo di minima per l’ictus cerebrale”): rationale and general methodology

F. Bovolenta¹, S. Caselli¹, F. Cappa¹, M. Mantovani¹, M. Faenza¹, P. Sale², M. Franceschini², F. La Porta¹ on behalf of PMIC group.

¹Rehabilitation Unit, Nuovo Ospedale Civile di Modena (Italy)

²IRCSS San Raffaele Pisana, Roma (Italy)

Introduction. PMIC (“Protocollo di Minima per l’Ictus Cerebrale”, 2006) is a collection of scales and instruments aimed at gathering a minimum data set on Italian Stroke patients undergoing rehabilitation¹. The protocol, that spans from the acute to the community stage of recovery, includes several scales covering both the “Body Functions” and “Activities and Participation” domains of ICF. The goal of this study was to test whether raw scores of PMIC scales satisfied criteria for interval-level measurement using Rasch Analysis². **Material and methods.** Data were collected within a 3-year multicenter observational study involving patients with stroke. The following scales were analyzed: Motricity Index (MI) and Canadian Neurological Scale (CNS) for the ICF domain “Body Functions” and Trunk Control Test (TCT) and Barthel Index (BI) for the ICF domain “Activities and participation”. Two samples were employed for these analyses: a 1795 observations sample related to the rehabilitative phase and a further sample of 3280 observations (both acute and rehabilitative phase). For each scale, five requirements were checked: correct ordering of score categories, unidimensionality, local independence, invariance and absence of Differential Item Functioning (DIF). **Results.** Several technical issues related to breadth of sample size emerged and had to be addressed when conducting the analyses. With the exception of TCT, none of the other PMIC scales satisfied, in their original forms, interval-level measurement requirements and had to be modified accordingly. Details on each analysis are provided in the companion abstracts. **Conclusion.** These results need to be taken into account when using PMIC for clinical and research purposes.

References

1. Lenti G, Massucci M, Agosti M, Zampolini M, Paolucci S, Franceschini M. Assessment of Stroke Patients: “Protocollo di Minima per l’Ictus – PMIC”. Towards an Italian Stroke Rehabilitation Register Eur.J.Phys.Rehabil.Med. 2008;44:263-9.
2. Tesio L. Measuring behaviours and perceptions: Rasch analysis as a tool for rehabilitation research. J Rehabil Med 2003;35(3):105-15.

Analysis of the measurement properties of PMIC (“protocollo di minima per l’ictus cerebrale”): rasch analysis of motricity index and canadian neurological scale

G. Lenti¹, S. Caselli², F. Bovolenta², L. Perrero³, M. Franceschini⁴, F. La Porta² on behalf of PMIC Group.

¹Rehabilitation Unit, Ospedale G. da Saliceto, Piacenza (Italy)

²Rehabilitation Unit, “Nuovo Ospedale Civile” di Modena (Italy)

³Rehabilitation Unit, Azienda Ospedaliera “S.S. Antonio e Biagio”, Alessandria (Italy)

⁴IRCSS San Raffaele Pisana, Roma (Italy)

Introduction. Canadian Neurological Scale (CNS) and Motricity Index (MI) are two “Body Functions” scales included in PMIC, a collection of scales aiming at gathering a minimum data set on Italian Stroke patients¹. The goal of this study was to test whether raw scores of MI and CNS satisfied criteria for interval-level measurement using Rasch Analysis. **Materials and methods.** Data were collected within a multicenter observational study (October 2006 – October 2009) conducted on a population of stroke patients. For these analyses, a sample of 500 random observations was chosen from a larger sample of 1795 observations collected during the rehabilitative phase. The following five requirements were checked: correct ordering of response categories, unidimensionality, local independence, invariance and absence of Differential Item Functioning (DIF). For each scale, the stability of final solutions obtained was tested using further 4 random samples. **Results.** In order to achieve a final fitting solution items of MI had to be rescored and reduced to three, although the presence of DIF by age was revealed for two items (hip flexion and shoulder abduction). Analysis of CNS confirmed the presence of two separate dimensions (motor and cognitive). A final fitting solution was achieved for CNS “motor” after rescored and deleting one item (distal arm), although DIF by age for the item “proximal leg” was discovered, whereas no final fitting solution could be found for the CNS “cognitive” scale. **Conclusion.** The “Body Functions” scales included in PMIC do not satisfy criteria for interval-level measurement. Despite substantive changes to their original structure in terms of scoring and item content, further adjustments are needed for the presence of DIF by age. The clinical and scientific implications of these results are discussed.

References

1. Franceschini M, Paolucci S. Basic Assessment of Stroke. Protocollo di minima per l’ictus cerebrale. Eur J Phys Rehab Med 2008;44:100-1

Analysis of the measurement properties of PMIC (“protocollo di minima per l’ictus cerebrale”): rasch analysis of barthel index and trunk control test

C. Da Re¹, S. Caselli², F. Bovolenta², D. Bonaiuti³, M. Franceschini⁴, F. La Porta² on behalf of PMIC group.

¹Rehabilitation Unit, “Casa di Cura Habilitata”, Zingonia, BG (Italy)

²Rehabilitation Unit, “Nuovo Ospedale Civile” di Modena (Italy)

³Rehabilitation Unit, S. Gerardo Hospital Monza (Italy)

⁴IRCSS San Raffaele Pisana, Roma (Italy)

Introduction. Barthel Index (BI) and Trunk Control Test (TCT) are two “Activities and Participation” scales included in PMIC, a collection of scales aiming at gathering a minimum data set on Italian Stroke patients¹. BI assesses classically the level of independence in activities of daily living, whereas TCT tests the ability to perform supine and sitting mobility task functionally related to trunk control. The goal of this study was to test whether raw scores of BI and TCT satisfied criteria for interval-level measurement using Rasch Analysis². **Materials and methods.** Data were collected within a multicenter observational study (October 2006 - October 2009) conducted on a population of stroke patients. For these analyses, a sample of 500 random observations was chosen from two larger samples (1795 observations for TCT and, respectively, 3280 for BI). The following five requirements were checked: correct ordering of score categories, unidimensionality, local independence, invariance and absence of Differential Item Functioning (DIF). For each scale, the stability of final solutions obtained was tested using further 4 random samples. **Results.** TCT showed to fit the Rasch Model in its original form. A final fitting solution for BI was achieved after rescoring four items and deleting one (bowel control). No DIF was present for both scales. **Conclusion.** The “Activities and participations” scales included in PMIC satisfy criteria for interval-level measurement, although the original structure of BI need to be modified in terms of scoring and item content. The clinical and scientific implications of these results are discussed.

References

1. Franceschini M, Paolucci, S. Basic Assessment of Stroke. Protocollo di minima per l’ictus cerebrale. Eur J Phys Rehab Med 2008;44:100-1.
2. Tesio L. Measuring behaviours and perceptions: Rasch analysis as a tool for rehabilitation research. J Rehabil Med 2003;35(3):105-15.

Diabetes and rehabilitation activity: a sure correlation. An initial Study

L. Scalzo, D. Galasso, I. Amelio, B. Farenza, M. Golia, I. Gabriele, V. Rubino

RSA Madonna di Porto Gimigliano (CZ)

Introduction. Diabetes is a disease of great interest also in rehabilitation⁽¹⁾ **Materials and methods.** In this study we examined 40 patients who are undergoing rehabilitation treatment. Patients so come to our observation for orthopedic or neurologic disabilities. 20 patient suffering of diabetes mellitus. All the patients are studied with the clinical examination, ICF Classification, FIM scale, VAS scale and monitoring careful of blood glucose before and after exercise. **Results.** In the diabetic patients has been a reduced threshold dolorifica e proprioceptive. Also we can see a reduced load distribution. This latter fact is confirmed by instrumental evidence⁽²⁾ **Conclusion.** In the patients with diabetes 1 although the risk of complications exercise should not be limited For the positive impact of the health. In the patients with diabetes 2 the exercise improves the metabolic compense⁽³⁾

References

1. Goodyear L,Kahn B., Exercise, glucose transport and insulin sensitivity. Annu Rev Med 1998;49:235-261.
2. Peirce N.- Diabetes and exercise, Br.J.Sports Med 1999;33:161-173.
3. Wallberg, Henriksson H, Rincon J, Zierath J. Exercise in the management of non insulin dependent diabetes mellitus Sports Med. 1998;25:25-35.

The Use of FIM Classification in a group of patients with cardiovascular disability: inicial study in rehabilitation center

L. Scalzo, A.M. Pirillo, A. Celia, E. Dardano, V. Bilotta, T. De Masi, I. Gabriele, L. Iannelli

Centro di Riabilitazione Estensiva Sasà Martino Isola C.Rizzuto

Introduction. The FIM Classification is a most important index of load relief and indirectly a index of disability. In the recent literature great emphasis has been given to this classification also in the cardio-

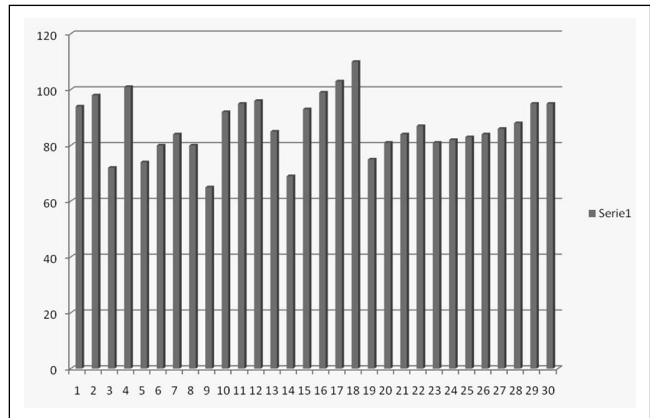


Figure 1.

vascular disease. **Materials and methods.** In the our rehabilitation center we used the FIM classification in 30 patients (10 M e 20 F) with cardiovascular disease. In most cases the patient arrived at our center for orthopedic disability. The most frequent cardiovascular disease studied was the heart failure. All the patients are studied with the clinical examination, ICF classification (SF), FIM scale in initial phase and in terminal phase of therapy. **Results.** This is a preliminary study: statically observation is impossible because the Campion is restricted . However some observations are possible In the most cases, the FIM items frequently deficitary are the motor ITEMS. In a smaller percentage of patients were found cognitive disorders. In the following chart were showing the total ITEM FIM. **Conclusion.** Even in the cardiovascular disability, the FIM scale is a useful tool for rehabilitation equippe because provides important information for the rehabilitative project and programs. These elements also in cardiovascular disability are the central core of rehabilitation center live

References

1. Mourt L, Teffaha D, Bouhaddi M, Ounissi F, Vernochet P, Dugue B, Regnard J, Monpère C. Exercise rehabilitation restores physiological cardiovascular responses to short-term head-out water immersion in patients with chronic heart failure. J Cardiopulm Rehabil Prev. 2010 Jan-Feb;30(1):22-7.
2. Weintraub WS. Do more cardiac rehabilitation visits reduce events compared with fewer visits? Circulation. 2010 Jan 5;121(1):8-9.
3. Pashkow FJ. Cardiac rehabilitation: not just exercise anymore- Cleve Clin J Med. 1996 Mar-Apr;63(2):116-23.

Disability and quality of life in the mastectomy: Preliminary study

G. Crispino, B. Scornaienghi, L. Scalzo, I. Gabriele, L. Iannelli, R. Pedace

Clinic Service Center Piano Lago di Mangone

Introduction. Mastectomy is a surgical removal of breast partially or completely. In this patients the rehabilitative approach must be global because the mastectomy caused alteration in various structures. **Materials and methods.** In this study we studied 30 patients with mastectomy disabilities. All the patients are studied with the clinical examination, ICF classification (SF), FIM scale in initial phase and in terminal phase of therapy⁽¹⁾ **Results.** This is a preliminary study: statically observation is impossible because the Campion is restricted . However some observations are possible. The most common impairment observed was arm pain on motion. We can observed , across clinical measure(delta rules) , a reduction for edema in the most patients (60%) With the ICF Classification we can observed a reduction in the activity and in the participation. ⁽²⁾This redction is absent in the final control. **Conclusion.** Pain relief should be the priority of treatment along with the prevention of joint movement restriction to ensure a sufficient quality of life for surgically treated breast cancer patients.⁽³⁾

References

1. Kaya T, Karatepe AG, Günaydn R, Yetiş H, Uslu A. Disability and health-related quality of life after breast cancer surgery: relation to impairments - South Med J. 2010 Jan;103(1):37-41;
2. Hack TF, Cohen L, Katz J, Robson LS, Goss P.- Physical and psychological morbidity after axillary lymph node dissection for breast cancer. J Clin Oncol. 1999 Jan;17(1):143-9;
3. Hack TF, Kwan WB, Thomas-Maclean RL, Towers A, Miedema B, Tilley A, Chateau D. Predictors of arm morbidity following breast cancer surgery. Psychooncology. 2010 Jan 22.

Our experience in the treatment of rotator cuff tears in the elderly patients by a infiltrative and rehabilitative treatment

C. Costantino, S. Olvirri, R. Ciraulo, E. Marangio.

Physical and Rehabilitation Medicine Postgraduated School , University of Parma, Italy

Introduction. Rotator cuff tears are cause of disability in elderly patients. The gold standard treatment is surgery. In selected cases several authors recommended the use of intraarticular infiltration of ialuronic acid in association by a rehabilitative program. The aim of this study is to evaluate the efficacy of rehabilitative and infiltrative treatment with hyaluronic acid in elderly patients with rotator cuff tears, who do not present indications for a surgical intervention or were unwilling to do it. **Materials and methods.** We have selected 18 patients, (10 men and 8 women), in a range of 70 and 85 years (on average age 77.5 years) with a partial rupture of the rotator cuff showed by ultrasound and / or RMN. All patients showed symptoms like sharp pain, loss of range of motion of the shoulder and loss of autonomy in daily life activities. Each patient has been evaluated as far as pain by the Visual Analogic Scale (V.A.S.); and by Constant Murley and Shoulder Rating Questionnaire for functional limitation and independence in daily life activities. We performed a series of three intra-articular infiltration of hyaluronic acid (molecular weight between 800 and 1200 Kdalton) followed by a focused.rehabilitation program. **Results.** The results achieved have been very encouraging since the statistic evaluation showed a great success ($p < 0,0005$) and therefore an improvement of the parameters considered. The protocol we have here shown has been appreciated by all patients who have been satisfied. **Conclusion.** The infiltrative-rehabilitative treatment practiced for these selected cases showed a certain efficacy. The action on pain it's been possible due to the improvement of the range of motion and the functionality of the shoulder. It may be considered a valid choice instead of a surgical treatment, that is at the moment the gold standard in classic cases of rupture of rotator cuff. However we believe we have to increase our survey . We are planning further follow-up (at 12th month) so as to compare this treatment with others already considered valid in literature.

Labour inclusion of youths with disabilities –multidimensional assessment with ICF method – ICF multi-stringa experimentation

A. Lussu¹, G. Solinas², A. Bressan³

¹nominated Director of Complex Operative Unit health and socio-health rehabilitation ASL Cagliari

²Psychologist and physiotherapist Complex Operative Unit health and socio-health rehabilitation ASL Cagliari

³Degree in Statistics and Economics, Consultant and Senior Trainer, Studio Vega

Introduction. The *Struttura Complessa Riabilitazione ASL Cagliari* (Cagliari health authority rehabilitation complex), 7 town councils, the Province of Cagliari and social and welfare organisations, made available people with specialised roles and competence with the aim of co-planning strategies, aims and actions for the protection and development of people with disabilities. In 2006 the project *inserimenti lavorativi ILD (Inclusione Lavorativa Disabilità)* (ILD labour insertion – disability labour inclusion) was established. The intention was to create an integrated socio-health work group to assess young people with disabilities and to facilitate their access into the work place. **Materials and methods.** A *multi-stringa* was created in ICF language in order to instantaneously highlight the capacity and performance, work skills and autonomy of the individual with the aim of targeted insertion, highlighting the environmental facilitators needed. Young people with disabilities are assessed according to their “*functioning*”, using holistic, multi-dimensional and ecological methods according to the ICF paradigm. Assessment was carried out by a socio-health team of psychiatrists, physiotherapists, social workers, psychologists and educators. The assessment led to a “*skills profile*” in relation to the person's abilities. Observation was carried out in simulated programmes directly experimented in workshops or traineeships. **Results.** The observation period, during which domains and subdomains were gathered (including facilitators/environmental barriers), was useful for conducting targeted placement. A *procedural algorithm* was created, with the participation of other services, such as Ce.S.I.L (*Centro Servizi per l'inserimento lavorativo dei soggetti svantaggiati* - Services centre for work place-

ment of disadvantaged persons), as well as the productive sector, to have the chance for an effective encounter between work demand and supply. The poster illustrates the flowchart, the assessment protocol synthesis, the (*multistringa*) ICF forms used to describe individuals' functionality. **Conclusion.** 21 young people were involved: 15 of the assessed are yet to be inserted and are under the tutoring of the socio-health team; 10 have been inserted in a traineeship; 7 have been inserted in businesses with *borse lavoro* (Ministry of Labour grants for disabled people participating in specific projects).

References

- World Health Organisation: ICF-CY International classification of functioning, disability and health, Erickson, 2007.
Borgnolo G, De Camillis R, Francescotti C. ICF e Convenzione ONU sui diritti delle persone con disabilità – Nuove prospettive per l'inclusione (ICF and UN convention on the rights of persons with disabilities – new perspectives for inclusion). Erickson 2009.

Calcific tendinosis of shoulder. Extracorporeal shock wave therapy

J.A. Mirallas-Martínez, M.T. Sabater Querol, M.J. Casas-Lázaro, M.A. Mendoza-Latorre, N. Guardiola-Beltrán, S. Qudsi-Sinclair.

General Hospital of Castellón. Department of Physical Medicine and Rehabilitation. Castellón de la Plana. Spain.

Introduction. ECSWT is an increasingly popular therapeutic approach to the treatment of a number of soft tissue complaints. Benefit has been demonstrated in calcific tendinosis of rotator cuff. The objective is to perform a study of the effect and the tolerance of the ECSWT, in patients with calcific tendinosis of shoulder. **Materials and methods.** Between 14 February, 2002 and 24 February 2010, we prospectively studied 139 consecutive adults patients with calcific tendinosis of shoulder, treated with ESWT, 1 session for week, 4 weeks. All were assessed before each treatment and one month, after completion of therapy. **Results.** 139 subjects, 104 (74.8%) were women and 35 (25.2 %) men, of 48,7±7,4 years old. The side was right in 78 (56,1 %) and left in 61 (43,9%). The mean duration of symptoms was 2,7±2,9 years. They had previously been treated with: medication 125 (89,9 %), steroid injection 68 (48,9%), electrotherapy 80 (57,6%), sonotherapy 77(55,4%), Cyriax 31(22,3%), thermotherapy 43 (30,9%), kinesitherapy 67(48,2%), and others 25(17,9%) patients. The interval between the last treatment and the ECSWT was 3,7±7,6 months. The energy density was 0,6±0,5 mJ/mm², with 2.211,3±750 impulses. At 1 month after the ECSWT, the evaluation resulted in significant improvement in pain (66,2 % less in activity) and active articular rank (32,7^o more in abduction). The limitations in daily living activity, sporting and working activity that existed initially in 139 (100%), persisted in 18 (12,9%) and 26 (18,7%) respectively. The calcifications that existed in 139 (100%), persisted in 56 (40,3%). The tolerance was good without important pain in 90 (64,7%), without secondary effects of interest. **Conclusion.** ECSWT in calcific tendinosis of shoulder are well tolerated, and shows a significant effectiveness for pain relief, functional restoration and calcifications lithotripsy, with a mean satisfaction of 8,2±1,9 (0-10).

References

- Mirallas-Martínez JA. Efectividad de las ondas de choque extracorpóreas basada en la evidencia. *Rehabilitación (Madr)* 2005;39(2):52-8.

Plantar Fasciitis. Extracorporeal shock wave therapy.

J.A. Mirallas-Martínez, M.T. Sabater-Querol, M.A. Mendoza-Latorre, N. Guardiola-Beltrán, S. Qudsi-Sinclair, M.J. Casas-Lázaro.

General Hospital of Castellón. Department of Physical Medicine and Rehabilitation. Castellón de la Plana. Spain

Introduction. Plantar fasciitis pain is severe and can cause loss of time from work, sometimes leading to total and/or partial disability. The objective is to study the effect and the tolerance of the treatment with extracorporeal shock wave therapy (ESWT) in plantar fasciitis. **Materials and methods.** Between 24 February, 2002 and 24 February 2010, we prospectively studied 120 consecutive adults patients with plantar fasciitis, treated with ESWT, 1 session for week, 4 weeks. All were assessed before each treatment and one month, after completion of therapy. **Results.** 120 subjects, 72 (60%) were women, and 48 (40%) men, of 49,7±11.3 years old. The side was left in 60 (50%) and right in 60 (50%). The mean duration of symptoms was 1,3±2,3 years. They had previously been treated with: medication 94 (78,3%), steroid injection 94 (78%) electrotherapy 42 (35%), sonotherapy 65(54,2%), Cyriax 28 (23,3%), thermotherapy 13 (18,8

%), kinesiotherapy 46 (38,3%) and others 32(26,7%). The interval between the last treatment and the ECSWT was $1,8 \pm 2,2$ months. The energy density was $0,36 \pm 0,12$ mJ/mm², with $1.432,9 \pm 558,2$ impulses. At 1 month after the ECSWT, the evaluation resulted in significant improvement in pain (81,7 % less in activity) and active articular rank (7,9^o±9,9^o more). The limitations in daily living activity, sporting and working activity that initially existed in 120 (100 %), persisted at the month in 5 (4,2%) and 7(5,8%) respectively. The fasciitis that existed in 15 (12,5%) disappeared. The spur that existed in 49 (40,8 %) persisted. The tolerance was good without important pain in 82 (68,3 %) and without secondary effects of interest. **Conclusion.** ECSWT in plantar fasciitis, are well tolerated, and shows a significant effectiveness for pain relief, functional restoration, with a mean satisfaction of $8,2 \pm 2,0$ (0-10).

References

Mirallas-Martínez JA. Efectividad de las ondas de choque extracorpóreas basada en la evidencia. *Rehabilitación (Madr)* 2005;39(2):52-8.

Lateral epicondylitis. Extracorporeal shock wave therapy

J.A. Mirallas-Martínez, T. Ricarte-Benedito, M.C. Tudela-Salom, M.A. Mendoza-Latorre, N. Guardiola-Beltrán, M.J. Casas-Lázaro, S. Qudsi Sinclair.

General Hospital of Castellón. Department of Physical Medicine and Rehabilitation. Castellón de la Plana. Spain

Introduction. The lateral epicondylitis, in most cases is a result of repetitive movements that require the forearm muscles to be engaged. It is a common workplace or athletic injury. The objective is to study the effect and the tolerance of the treatment with extracorporeal shock wave therapy (ESWT) in lateral epicondylitis. **Materials and methods.** Between 28 May, 2002 and 24 February 2010, we prospectively studied 65 consecutive adults patients with lateral epicondylitis, treated with ECSWT, 1 session for week, during 4 weeks. All were assessed before each treatment and one month, after completion of therapy. **Results.** Of the 65 subjects, 47 (72,3%) were women, and 18 (27,7%) men, of $46,8 \pm 7,5$ (30-73) years old. The side was right in 53 (81,5 %) and left in 12(18,5%). The mean duration of symptoms was $10,5 \pm 11,2$ months. They had previously been treated with: medication 53 (81,5 %), steroid injection 45 (69,2%), electrotherapy 41 (63,1%), sonotherapy 41 (63,1%), Cyriax 32(49,2%), thermotherapy 13 (20%), kinesiotherapy 26 (40%) and other 9(13,8%). The interval between the last treatment and the ECSWT was $2,3 \pm 2,7$ months. The energy density was $0,23 \pm 0,09$ mJ/mm², with $1.142,7 \pm 335,9$ impulses. At 1 month after the ECSWT, the evaluation resulted in significant improvement in pain of 76,3% less in activity and active articular rank of 5^o more. The limitations in daily living activity, sporting and working activity that existed initially in 65 (100%), persisted only in 2 (3,1 %) at the month. The tolerance was good without important pain in 46 (70,8%) and without secondary effects of interest. **Conclusion.** ECSWT in lateral epicondylitis, are well tolerated, and shows a significant effectiveness for pain and relief, functional restoration, with a mean satisfaction of $8 \pm 2,3$ (0-10).

References

Mirallas-Martínez JA. Efectividad de las ondas de choque extracorpóreas basada en la evidencia. *Rehabilitación (Madr)* 2005;39(2):52-8.

Principles of neurogenic dysphagia rehabilitation

I. Avdyunina, L. Chernikova, E. Berdnikovich, N. Dokuchaeva, V. Selivanov

Research center of neurology, RAMS Moscow

Introduction. Deglutition is so delicate and accurate coordinated sequence of events that dysfunction may appear in different stages and for different reasons and cause diagnostic complications and therapeutic difficulties. **Materials and methods.** 123 patients between the ages of 17 and 78 years with different severity neurogenic dysphagia (ND) (stroke, peripheral neurogenic dysfunction, ctr.) are investigated. Clinical bedside examination was supplemented with video fluoroscopy (VFSE) and/or fiber optic swallowing evaluation (FEES). The methods of rehabilitation: dietetic, compensating, training, physical-therapy (intra-pharyngeal electro stimulation -IPES and transcutaneous electrical stimulation -TCES), surgical, substitution of lost swallowing function with nutrition support. The conception TCES realized in vocaSTIM based on unity of manual neuromuscular

electro stimulation with special exercises at the same time. Cricopharyngeal myotomy was fulfilled in M. Abakumov modification. **Results.** We distinguished syndromes of ND: disturbance of food bolus forming 32%; disturbance of "larynx protection" 80%; bulbar 44%, pseudo bulbar 53% and false glossopharyngolaryngeal palsy 15,7%; cricopharyngeal achalasia 16%; esophageal dysphagia 4%. 86% patients had several syndromes. In 57% cases we observed recovery or obvious improvement and in 1/5 cases we saw no considerable effect. Treatment efficacy depended on etiology, syndrome and severity of ND, well-timed and functional application. Cricopharyngeal myotomy dramatic changed for the better quality of life in 77,8% patients. TCES in all cases was successful and depended on procedure frequency per day and duration of treatment. The results were confirmed by FEES or video fluoroscopic swallowing examination. **Conclusion.** Successful rehabilitation is impossible without accurate topical comprehension of ND symptoms. Rehabilitation strategy must be elaborated in each specific case proceed from patients originality and under the video fluoroscopy/endoscopy swallowing examination control.

Characteristics and Prognosis of Pusher Syndrome in Stroke Patients

Sang Beom Kim, Kyeong Woo Lee, Jong Hwa Lee

Dept. of Physical Medicine and Rehabilitation, Dong-A University College of Medicine, Republic of Korea

Introduction. To evaluate the incidence, associated neuropsychological symptoms, imaging feature and prognosis of pusher syndrome (PS). **Materials and methods.** One hundred-ninety-seven patients with unilateral acute stroke were enrolled. Patients were evaluated for presence and severity of PS using a standardized scale for contraversive pushing, neurological examination, assessment of neuropsychological symptoms (neglect, anosognosia, aphasia, apraxia), activities of daily living (ADL) and neuroimaging studies (CT or MRI). ADL was measured with Korean version of modified Barthel index (K-MBI). **Results.** PS was found in 10.7% (n=21) of the included patients. No significant differences were found between patients with and without PS in age, sex, handedness, initial K-MBI score, neuropsychologic symptoms, lesion size and cortical involvement. Thalamic lesion was strongly correlated with PS ($p < 0.05$). PS had no independent influence on gain in ADL, but spent 4.8 ± 1.7 weeks ($p < 0.05$) more to reach the same final outcome level than did patients without PS. Average symptom duration of PS was 14.6 ± 3.6 weeks. Initial severity of PS did not influence on gain in ADL and recovery period. **Conclusion.** PS did not affect final functional outcome, but slowed the process of recovery considerably. And thalamus seems to be fundamentally involved in control of upright body posture. Presence of PS is more important than severity of initial PS for prognosis.

Anxiety and depressive symptomatology in Multiple Sclerosis patients with vesicourethral and sexual dysfunction. Preliminary data study

D. Marin, L. Monti Bragadin, E. Biasutti, P. Di Benedetto

Institute of Physical Medicine and Rehabilitation "Gervasutta" Hospital Udine, Italy

Introduction. The most common lower urinary tract symptoms (LUTS) in multiple sclerosis (MS) are irritative, obstructive or mixed (association of irritative and obstructive (LUTS). Symptoms of sexual dysfunction are also commonly reported in patients with multiple sclerosis. The aim of our study was to find the impact of lower urinary tract symptoms in QoL. **Materials and methods.** We examined a group (45 subjects) of consecutive chronic progressive multiple sclerosis patients who regularly received care at the I.M.F.R. rehabilitative centre of Udine (Italy). The patients were evaluated with EDSS, MMSE, BDI, CBA (anxiety scale), SF 12, Qualiveen questionnaire. We studied the correlation between clinical measures (EDSS, age, sex), vesicourethral symptoms (Qualiveen questionnaire) and sexual symptoms (evaluated by MSISQ 19) and the relation between anxiety and depression scores. **Results.** In our sample, EDSS is not related with vesicourethral (Spearman's Rho .207; sign. 2 tailed .172) and sexual (Spearman's Rho .153; sign. 2 tailed .386) symptomatology. Highly scores at the BDI related with sexual and urinary dysfunction. Anxiety symptoms are related with primary direct physical (Spearman's Rho .355; sign. 2 tailed .040) and secondary indi-

rect physical (Spearman's Rho .365; sign. 2 tailed .034) sexual dysfunction but not with tertiary psychosocial dysfunctions. **Conclusion.** LUTS may occur in MS even in the absence of severe disability. Sexual and vesicourethral dysfunctions have a significant impact in the quality of life of MS patients. The positive correlation between the BDI and the anxiety scale of CBA scores with the Qualiveen questionnaire demonstrate the relationship between these symptoms and the quality of life of MS patients.

References

1. R. Zivadinov, M. Zorzon, L. Monti Bragadin, et al. Sexual dysfunction in multiple sclerosis: II. Correlation Analysis. *Multiple Sclerosis* 5, 428-431, 1999.
2. P. Di Benedetto, C. Delneri, E. Biasutti et al. Vesicourethral dysfunction in multiple sclerosis. Initial assessment based on lower urinary tract symptoms and their pathophysiology. *Neurological Sciences* 29, 5348-5351, 2008.

Soft-tissue surgery and Botulinum toxin treatment in hemiplegic subjects with lower limb spasticity.

C. Lentino, G.A. Checchia, A. Barbano, G. Vigo

ASL2 Savonese, 'Santa Corona' Hospital, Pietra Ligure (SV) Italy

Introduction. Lower limb spasticity treatment have different possibility, including Botulinum Toxin Treatment (Btx)^[1] and soft tissue surgery (Sts)^[2]. In this work we evaluated the frequency wherewith two treatments are associated. **Materials and methods.** 112 Hemiplegic patients, underwent a Sts in our Hospital from 2003 to 2008, were included. All patients were able to walk ten meter at least and the aim of the treatments was gait improvement. Evaluation protocol, utilized both Btx and Sts was: a) clinical and neurological evaluation b) observational gait analysis c) dynamic polyelectromyography (pEMG) d) Cinematic analysis by optoelectronic system (only in selected cases). **Results.** 65 patients out of 112 (group 1: 58% of the total) made only Sts whereas 47 (group 2: 42% of the total) combined surgical operation with Btx treatments. Considering only group 2, 49% of them made btx treatments only before surgery, 27% of them utilized Btx treatment on non-operated muscles group and 24% of them after Sts needed of Btx treatment in the same operated muscles group. However in this last case interval between two Btx treatments grew after surgery treatment. **Conclusion.** Our work confirms that Sts can reduce Btx treatments in hemiplegic patients with lower limb spasticity. However, in some selected cases, Btx treatment after operation can be useful to maintain improvement obtained with surgery.

References

1. S.J. Pittock, A.P. Moore et al. A double-blind randomized placebo controlled evaluation of three dose of Botulinum Toxin Type A in the treatment of spastic equinovarus deformity after stroke; *Cerebrovascular Dis* 2005; 15:289-300.
2. Carda S, Bertoni M, Zerbinati P, Rossini M, Magoni L, Molteni F. Gait changes after tendon functional surgery for equinovarus foot in patients with stroke: assessment of temporo-spatial, kinetic, and kinematic parameters in 177 patients. *Am J Phys Med Rehabil.* 2009 pr;88(4):292-301.

Gait Analysis to assess Kinesio Taping Methot© efficacy in Neurological Patients

C. Lentino, G.A. Checchia, N. Camuzzini, G. Corvaglia, G. Vigo

ASL2 Savonese, 'Santa Corona' Hospital, Pietra Ligure (SV) Italy

Introduction. Kinesio Taping method (KTm) is widely utilized in sport medicine^[1] and recently also in neurological patients^[2], but without scientific evidence about its efficacy. This patients often present an irregular Rectus Femoral (RF) recruitment during gait, with consequent deficit in stability and gait efficacy. In this study we utilized gait analysis to determine if KTm can improve muscular recruitment, and consequently gait, in neurological patients. **Materials and methods.** We recruited 10 patients (2 women and 8 men): 5 with hypoactive and 5 with hyperactive RF during gait. Inclusions criteria were: a) interval from acute event greater than 6 months b) able to walk 10 meter at least c) no botulinum toxin of physiotherapy treatments during the study. We applied a Taping on RF and changed it every 3 days for two weeks. Evaluation was performed before and after application period, and consisted in: a) clinical and segmental evaluation b) dynamic polyelectromyography (pEMG) of RF c) Cinematic analysis by optoelectronic system. **Results.** We considered the maximum knee extension during stance phase and the maximum knee flexion during swing phase. From the pEMG we extrapolated some indicators to evaluate the EMG timing and the EMG area. After the KTm, 7 patients improved the knee extension and 6 patients improved knee flexion. Also in 6 patients the EMG timing

after application was more physiological than before. **Conclusion.** This preliminary study encourages us to continue research, considering more subjects and more muscle groups, and defining which patients could be suit better for KTm

References

1. Tieh-Cheng Fu et al, Effect of Kinesio taping on muscle strength in athletes-A pilot study; *Journal of Science and Medicine in Sport*, 2008.
2. Ewa Jaraczewska and Carol Long; Kinesio® Taping in Functional Use of the upper extremity in hemiplegia; *Top Stroke Rehabilitation* 2006;13(3).

Do orthopaedic shoes improve dynamic stability of gait in patients with severe foot&ankle injuries?

P. Terrier^{1,2}, F. Luthi², O. Dériaz^{1,2}

¹IRR, Institut de Recherche en Réadaptation, Sion, Switzerland

²Clinique Romande de Réadaptation SuvaCare, Sion, Switzerland

Introduction. Orthopedic Shoes (OS) are used to enhance ambulation and encourage participation in daily living activities. Despite numerous evidences of OS effectiveness, there is still a need to better characterize their effect on gait. Local Dynamic Stability (LDS) is the ability of locomotor system to maintain steady gait by accommodating small perturbations. LDS has been advocated as a clinically relevant parameter in the evaluation of mobility and the response to therapeutic interventions [1]. The objective was to assess LDS modification induced by OS in patients with foot&ankle injuries. **Materials and methods.** Thirty patients (age 44.4±11.3yr, body mass 79.8±10.7kg, height 172.8±5.8cm) with severe foot and/or ankle fractures performed four 30s walking trials with Normal Shoes (NS) and OS. A triaxial motion sensor recorded trunk accelerations at the low back level in Medio-Lateral (ML), Vertical (V) and Antero-Posterior (AP) directions. LDS was assessed by computing finite-length Lyapunov exponent (λ^1) [1]. **Results.** OS significantly improve gait stability in ML direction (14%): for NS $\lambda^1=0.68±0.16$; for OS $\lambda^1=0.59±0.13$ (paired t-test p=0.0001). The effect was less pronounced in V direction: for NS $\lambda^1=0.70±0.14$; for OS $\lambda^1=0.66±0.09$ (paired t-test p=0.03) and in AP direction: for NS $\lambda^1=0.65±0.15$; for OS $\lambda^1=0.59±0.10$ (paired t-test p=0.009). **Conclusion.** Complex foot & ankle fractures are often associated with a poor outcome, especially in terms of gait recovery capacity. Prescription footwear represents an important part of the treatment of after-effects. We showed that short walking test using low-cost sensor could efficiently assess footwear outcome. We observed that OS improve gait quality by increasing stability. Because poor dynamic stability is associated with a higher fall risk, this may explain one of the mechanism by which OS increase patients' confidence and comfort.

References

1. Dingwell JB, Cusumano JP: Nonlinear time series analysis of normal and pathological human walking. *Chaos* 2000;10:848-863.

The assessment of the prevalence rate of cerebrovascular incidents in patients having undergone Coronary Artery Bypass Graft (CABG) surgeries and complex cardiac surgeries, rehabilitated in the Cardiac Rehabilitation Department in the Cardiac Surgery Clinic of the PAM in Szczecin in the years of 2008 and 2009.

I. Denisewicz¹, A. Karczmarczyk¹, A. Brzeziński¹, S. Waligórski¹, M. Brykcyński¹, M. Mackiewicz-Milewska^{1,2}

¹The Department of Cardiac Surgery and The Department of Rehabilitation of the Pomeranian Medical University

²Department of Rehabilitation, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University, Poland.

Introduction. The aim of this study was to assess the prevalence rate of strokes and transient ischemic attacks among patients subjected to cardiac operations and safety of intensive cardiac rehabilitation. **Materials and methods.** 598 patients: 165 female (28%) and 433 male (72%) operated on and subsequently rehabilitated in the Cardiac Department in the years of 2008 and 2009 were subjected to retrospective analysis. The clinical data of the patients with cerebrovascular incident diagnosis was analyzed allowing of correlation between central circulatory disorder and a kind of surgical procedure carried out. **Results.** 33 (6%) patients with clinical symptoms of cerebrovascular accident in the early postoperative period: stroke 29 (88%) and TIA 4 (12%) were identified. Among patients with such complications 12 (36%) were female and 21 (64%) were male. In early period after cardiac surgeries (up to 30 days) ischemic stroke or TIA occurred in (6%) of the patients undergoing rehabilitation in the Department. As many

as 19 (58%) cerebrovascular incidents concerned patients with heart valve disease. The greatest proportion of strokes 11 (58%) occurred as a complication of aortic valve replacement surgery among patients with valve diseases. Another cardiac surgery laden with high risk of stroke or transient ischemic attack was mitral valve repair 3 (16%) and mitral replacement 3 (16%). 32 incidents of CVA occurred in the first 7 days after operation, only one occurred at the Department of Cardiac Rehabilitation. **Conclusion.** Intensive cardiac rehabilitation after cardiac surgery does not increase risk of cerebrovascular accidents.

References

1. Pruszczyk P, et al. Cardiology. Medical Tribune, 2009.
2. Sienkiewicz-Jarosz H, et al. Decline of 30 day case fatality for stroke between 1991/1992 and 2005, comparison of data from population based studies. J Neurol 2006 ;253(Suppl 2):16-7.

100 Hz vibration of the antagonistic muscle is able to reduce upper limb flexion spasticity in hemiplegic patients

C. Damiani¹, T. Sciarra², V. Rosati³, P.L. Chimento⁴, C. Fundarò⁴, C. Foti⁵, R. Casale⁴

¹San Raffaele Portuense Tosinvest, Roma, Italy

²Ph.D. in Physical and Rehabilitation Medicine, Università degli Studi Tor Vergata, Roma, Italy

³San Raffaele Portuense Tosinvest, Roma, Italy

⁴Dept. Clin Neurophysiology & Pain Rehabilitation Unit, Foundation "Salvatore Maugeri" IRCCS, Montescano, Italy

⁵Chair of Physical and Rehabilitation Medicine, Università degli Studi, Tor Vergata, Roma, Italy

Introduction. To control spasticity is a major task in neuro-motor rehabilitation. Usually rehabilitation programs are often associated with the use of drugs both systemically given or locally injected to control spasticity. However although generally effective, both have side effects sometimes limiting their use. A third possible way of controlling spasticity is by means of physical modalities. Recently mechanical vibration has been successfully used to reduce lower limb spasticity in spastic diplegia (1). Aim of the study is to clinically test in a group of hemiplegic patients the hypothesis that the application of a selective vibration stimulus on the upper limb flexor antagonist (i.e. the triceps brachii) can reduce the spasticity of the flexor agonist (i.e. the biceps brachii). **Materials and methods.** 20 patients affected by upper limb spasticity were randomly allocated to two groups. (PT) group received daily session of physiotherapy; (VIB+PT) received physiotherapy plus 30 minutes of daily 100 Hz vibration, applied over the belly of the triceps brachii muscle of the spastic side. Spasticity was evaluated using the modified Ashworth scale before starting treatment (T0), 48 hours after the fifth session (T1) and 48 hours after the last session of vibration (T2). **Results.** Fisher's exact test showed a statistically significant greater improvement in the VIB+PT group after 1 week (p=0.0001) and after 2 weeks (p=0.0078) compared to in the PT group. **Conclusion.** A vibratory stimulus of 100 Hz applied to the triceps brachii of a spastic upper limb is able to reduce the spasticity of the flexor agonist, biceps brachii. Results suggest a possible beneficial utilisation of a vibratory stimulation applied to the antagonist muscle in controlling flexion upper limb spasticity in a group of hemiplegic patients.

References

1. Ahlborg L, et al. Whole-body vibration training compared with resistance training: effect on spasticity, muscle strength and motor performance in adults with cerebral palsy. J Rehabil Med. 2006;38(5):302-8.

Mirror therapy in the rehabilitation of lower limb amputees: are there any contraindications?

R. Casale^{1,2}, V. Rosati², C. Fundarò¹, I. Clemenzi², C. Foti³, P.L. Chimento¹, C. Damiani²

¹Dept. of Clinical Neurophysiology & Pain Rehabilitation Unit, Rehabilitation Institute of Montescano, Foundation Salvatore Maugeri, IRCCS, 279040 Montescano, Italy

²San Raffaele Portuense Tosinvest, Rome, Italy

³Chair of Physical and Rehabilitation Medicine, Università degli Studi, Tor Vergata, Roma, Italy

Introduction. Mirror box therapy is used in pain therapy and in rehabilitation of amputees with phantom limb-related phenomena. It allows patients to view a reflection of their anatomical limb in the visual space occupied by their phantom limb. There are only limited reports of its possible side effects. **Materials and methods.** We

retrospectively reviewed the existence of side effects or adverse reactions in a group of 33 non-selected patients with phantom limb-related phenomena. **Results.** Nineteen reported confusion and dizziness, six reported a not clearly specified sensation of irritation and four refused to continue the treatment. Only four of the 33 patients did not have any complaints. **Conclusion.** Possible reasons for this large number of side effects could be the lack of selection of patients and the fact that the mirror box therapy was paralleled by a conventional rehabilitation approach targeted to the use of a prosthesis. Warnings on the need to select patients, with regard to their psychological as well as clinical profile (including time from amputation), and possible conflicting mechanisms between box therapy and conventional therapies should be taken into account.

References

1. Ramachandran VS. Plasticity and functional recovery in neurology. Clin Med 2005;5(4):368-73.
2. MacLachlan M, McDonald D, Woloch J, et al. Mirror treatment of lower limb phantom pain. A case study. Disabil Rehabil 2004;26(14-15):901-4
3. Chan BL, Witt R, Charrow AP, et al. Mirror therapy for phantom limb pain. N Engl J Med 2007;357(21):2206-7
4. Casale R, Damiani C, Rosati V. Mirror therapy in the rehabilitation of lower limb amputation. Am J Phys Med Rehabil 2009;837-42.
5. Casale R, Alaa L, Mallick M, Ring H. Phantom limb related phenomena and their rehabilitation after lower limb amputation. Eur J Phys Rehabil Med 2009;45(4):559-66.

Effectiveness of a comprehensive rehabilitation program in association with paracetamol at improving pain in a group of relatively young people affected by severe OA on waiting list for total joint replacement

R. Casale¹, C. Damiani², V. Rosati², T. Sciarra³, P.L. Chimento¹, C. Fundarò¹, C. Foti³

¹Dept. of Clinical Neurophysiology & Pain Rehabilitation Unit, Rehabilitation Institute of Montescano, Foundation Salvatore Maugeri, IRCCS, 279040 Montescano, Italy

²San Raffaele Portuense Tosinvest, Rome, Italy

³Chair of Physical and Rehabilitation Medicine, Università degli Studi, Tor Vergata, Roma, Italy

Introduction. Knee and hip osteoarthritis (OA) are the most common joint disorders and can also affect relatively young people. Although comprehensive inpatient rehabilitation and appropriate drug regimens are well established treatment in the elderly, no data are available on controlling pain and disability in relatively young people affected by severe OA on the waiting list for total joint replacement (TJR). The aim of this study was to assess the of subjects. **Materials and methods.** Thirty Day Hospital patients were enrolled and randomly divided in two groups (A and B). Both groups underwent 15 days of treatment consisting of strengthening exercises, flexibility and endurance training, relaxation and heat therapy of the painful joint. In addition to this rehabilitation program, group B patients received pharmacological treatment, consisting of 1 gr paracetamol three times a day. Pain intensity variation and absolute value were assessed using a visual analogue scale before treatment (T0), after each of the 3 weeks of treatment (T1 to T3) and after each of the 4 weeks of the post-treatment period of observation (T4 to T7). **Results.** Pain was relieved in the patients in both groups A and B. However, from the 1st week of treatment to the end of period of observation there was a statistically significant greater reduction of pain intensity in group B compared to group A (p<0.01). **Conclusion.** Stand-alone comprehensive rehabilitation can reduce pain also in a subgroup of relatively young patients with a severe form of OA on a waiting list for TJR. Better pain control can be obtained by adding a level 1 pharmacological treatment, i.e. paracetamol at a full dose of 3 gr/day, to the rehabilitation program. Thus the reduction in pain level is greater and obtained more quickly when a comprehensive rehabilitation program is accompanied by treatment with paracetamol

Acute stroke assessment in rehabilitation: proposal of a common regional multicentric dataset.

L. Carcelli¹, V. Di Giuseppe¹, M. Franceschini², C. Damiani¹

¹San Raffaele Portuense, Tosinvest, Rome, Italy

²San Raffaele Pisana, IRCCS, Tosinvest, Rome, Italy

Introduction. The purpose of this project is to adopt an automated, computerized clinical dataset to collect the medical data of acute stroke inpatients admitted to the "San Raffaele" ("SR")

Rehabilitation Centers of the Lazio region in Italy. Our aim is to introduce a standardized clinical chart for data collection, shareable by all regional "SR" Rehabilitation Units by means of the "SR" local network. This chart will be used to collect admission and discharge data (clinical and administrative information, functional measures) in order to create a common database for future prospective studies. **Materials and methods.** Every acute stroke patient admitted to an inpatient rehabilitation program, will receive a systematic assessment. All "SR" Rehabilitation Centers agreed on the collection of a common set of data including: age, sex, days from onset, discharging hospital and department, post-rehabilitation discharge destination, type of stroke (ischaemic or haemorrhagic), specific lesion location (according to Bamford classification), clinical features (size, hemispatial neglect, aphasia, dysarthria, dysphagia, PEG or NGT feeding) and outcome measures (FIM, Barthel Index, TCT, Canadian Stroke Scale, Motricity Index) at both admission and discharge. Administrative automated data will be collected using the International Classification of Diseases, 9th edition for the admitting diagnosis and comorbidities. **Result and Conclusion.** Future prospective research is required to determine whether a shared and standardized data collection may help to objectify the stroke injury and the effect of rehabilitative intervention on functional recovery.

References

Granger CV, Markello SJ, Graham JE, Deutsch A, Ottenbacher KJ. The uniform data system for medical rehabilitation: report of patients with stroke discharged from comprehensive medical programs in 2000-2007. *Am J Phys Med Rehabil.* 2009 Dec.
Lenti G, Agosti M, Massucci M, Zampolini M, Paolini S, Franceschini M. developing a minimum data set for stroke patients assessment: the "protocollo di minima per l'Ictus (PMIC) as a starting point towards an Italian stroke registry. *Eur J Phys Rehabil. Med* 2008.

Tai – Chi effects on balance, mobility, and gait in parkinson disease: preliminary study

C. Damiani¹, S. Cassarino², S. Ippolito¹, L. Bestavashvili¹, R. Casale³, I. Clemenzi¹, C. Foti²

¹*San Raffaele Portuense, Tosinvest, Rome, Italy*
²*Chair of Physical and Rehabilitation Medicine, Università Tor vergata, Rome, Italy*
³*Dept. of Clinical Neurophysiology & Pain Rehabilitation Unit, Rehabilitation Institute of Montescano, Foundation Salvatore Maugeri, IRCCS, Montescano, Italy*

Introduction. The primary goal of this preliminary study was to examine whether Tai Chi could improve gait, mobility and balance in patients with Parkinson Disease (PD). We took into consideration the importance of the new rehabilitative strategies able to reduce the disability in PD. **Materials and methods.** A group of eight patients underwent the standard protocol treatment and 20 sessions of Tai Chi training. The inclusion criteria: age between 40-75; H&Y :1.5-3; MMSE >20; ability to maintain the straight position independently and ability to walk with/without an assistive device., The exclusion criteria : serious medical problem; other neurological disorders besides PD. A pre-and post-testing was performed by the following Scales of Evaluation: Barthel, UPDRS, FES (fall fear scale), Tinetti. **Results.** The results obtained could confirm the validity, appropriateness and safety of this treatment. The observed patients demonstrate the balance and mobility improvement and increased self-confidence in the daily life activities. Furthermore, all patients expressed the great satisfaction and enjoyment regarding Tai Chi training. **Conclusion.** Further randomized study is required and would be performed to verify and compare the effectiveness and benefits of Tai Chi as a rehabilitative exercise in addition to the traditional treatment.

References

Hackney M, Earhart G. Tai Chi improves Balance and Mobility in People with Parkinson Disease. *Gait Posture* 2008.
Li F., Harmer P, Fisher J, Xu J, Fitzgerald K, Vongjaturapat N. Tai Chi based exercise for the older adults with Parkinson disease: a pilot program evaluation. *Journal of aging and Physical activity*, 2007.

The impact of body image disturbance on rehabilitation programs in lower limb amputees: a pilot study

C. Damiani¹, V. Rosati¹, R. Casale², I. Clemenzi¹, V. Dell'Armi³, C. Foti⁴

¹*San Raffaele Portuense Tosinvest, Rome, Italy*
²*Dept. of Clinical Neurophysiology & Pain Rehabilitation Unit, Rehabilitation Institute of Montescano, Foundation Salvatore Maugeri, IRCCS, Montescano, Italy*

³*San Raffaele Pisana, IRCCS, Tosinvest, Rome, Italy*
⁴*Chair of Physical and Rehabilitation Medicine, Università degli Studi, Tor Vergata, Roma, Italy*

Introduction. Amputee gait training with a prosthesis seems to be strongly related to disturbed self body image because of limb loss and the phantom pain syndrome. This relation is not described in the literature. The aim of this single centre, pilot study was to verify and quantify self body image disturbances in amputees and their impact on rehabilitation programs in these patients, such as adaptation to the prosthesis, anxiety and depression. **Materials and methods.** 33 inpatients who had undergone lower limb amputation were enrolled in this experimental study. All patients participated in a conventional rehabilitation program for amputees. Exclusion criteria were non-collaboration, serious cognitive impairment, central nervous system disorders, and severe co-morbidities. The main outcome measures, assessed at the beginning and at the end of the rehabilitation program, were: FIM, MMSE, ABIS, TAPES, MPQ, CES-D, STAI-Y. **Results.** All patients had notable functional improvements. There was a strong negative correlation between the self body image disturbance and general and social adaptation to the prosthesis. There were strong positive correlations between body image disturbance and state and trait anxiety and depression. **Conclusion.** This study shows the importance of a specific rehabilitation program. In particular, we observed that early and appropriate prosthesis use is necessary for reconstruction of a correct self body image.

References

Alesi A, Damiani C, Pernice D. Europa TAPES (Trinity Amputation and Prosthesis Experience Scales): traduzione e adattamento italiani-fase preliminare *Medicofisica* 40 (3 Suppl.1):653-4.
Casale R, Alaa L, Mallick M, Ring H. Phantom limb related phenomena and their rehabilitation after lower limb amputation. *Eur J Phys Rehabil Med* 2009;45:559-66.
Murray CD, Fox J. Body image and prosthesis satisfaction in the lower limb amputee. *Disabil Rehabil* 2002;24(17):925-31.

Reability of a new video anlisy software to assess visuomotor skills

M. Bejor^{1,2}, E. De Bernardi¹, C. Pavese¹, M. Chiappedi^{1,2}, E. Dalla Toffola^{1,3}

¹*University of Pavia, Dept. Surgical, Resuscitation, Rehabilitation and transplants Science*
²*Fondazione Don Gnocchi Salice T.*
³*IRCCS Pol. S.Matteo, Pavia*

Introduction. Visuomotor skills are the normal psychomotor development milestones and their alterations might reveal the presence of motor disorders. In child neurology and rehabilitation the assessment of these skills is currently performed through more or less complex neuropsychological or neurophysiologic tests that capture the disorders effect, but the movement itself is scarcely studied because complex instruments are needed. Optoelectronic devices are very expensive, need dedicated rooms and solid markers placed on the tested subject . For clinical purposes video recording and video images analysis based devices can be used easily and, as they don't need dedicated rooms nor the preparation of the subject, during normal activities and in not dedicated environments. **Materials and methods.** High speed video recording devices and a new software tool (Dartfish 5.5tm) were used to record the movement of 21 healthy children arms during a standardized maze task. The videofiles were elaborated and joints rotation centers trajectories and their variation were calculated in different tasks. **Results.** The obtained curves were able to separate childrens with different motor development stages (with a cut at the age of 7) according with studies performed with much more complex instruments. **Conclusion.** This is a low cost method, non invasive, easy to perform and allows an accurate evaluation of joint angles and a quantitative description of the movement. The major drawbacks are the single plane imposed by video recording and the requirement for a well organized and lighted environment.

References

Athenes S, Sallago I, Zanone PG, Albaret JM. Evaluating The Coordination Dynamics Of Handwriting *Hum Mov Sci* 2004;23:621-641.
Gravenhorst RM, Walter CB. Cognitive mechanisms of visuomotor transformation in movement imitation: examining predictions based on models of apraxia and motor control. *Brain Cogn* 2009;71(2):118-128.

Autonomy assessment one year after stroke: predictors of functional outcomes

E. Medici, R. Lorenzetti, P. Giacchetti, E. Giaccaglini, M. Sebastianelli, S. Franceschini, R. Casci, P. Orazzi, B. Gobbi, M. Baroni
ASUR Marche Territorial Zone n.5 Jesi, Stroke Care Unit (U.O of Neurology and U.O of Rehabilitative Medicine.

Introduction. Exploring predictors of functional decline in the long term is useful to optimize the planning of therapeutic and relief resources at discharge. Aim of the study is to assess the relief load and the statistically significant predictors of clinical-functional outcome, in terms of autonomy, in stroke patients. **Materials and methods.** In the year 2008, 170 stroke patients consecutively admitted in the Stroke Care Unit of the hospital of Jesi, have been evaluated at admission (T0), at discharge (T2) and 12 months after stroke through telephone interview (T12). The following predictors of functional dependence (defined as Rankin Scale score ≥ 3) were studied through logistic regression analysis: age, sex, cognitive impairment, stroke severity at admission measured with the NIHSS. Comparison of functional dependence scores between T1 and T12 were performed using the Wilcoxon's Test for coupled data. **Result.** Mortality rate was 14% at T1 and 21% at T12. Outpatients were 55% at T1 and 88,5% at T12. No statistically significant differences were observed for functional dependence evaluated at T1 and T12 (65% versus 59%). Rehabilitative treatment was continued with clear prevalence of the domiciliary setting in 57% of patients. Age is an independent predictor of necessity of assistance and use of aids in the outpatients. **Conclusion.** Age, stroke severity and cognitive impairment are independent predictors of disability one year after stroke, in accordance with literature data (1). Continuation of rehabilitative treatment contributes to contain the degree of functional dependence in the long term after stroke. The effectiveness of a model of Stroke Care Unit is confirmed both in terms of reduction of mortality during hospitalization and one year after stroke, both in terms of functional impairment containment in the long term.

References

1. Appelros P et al. Poor Outcome After First-Ever Stroke. Predictors for Death, Dependency, and Recurrent Stroke Within the First Year. *Stroke*. 2003;34:122-126.

Are football muscle lesions related to anthropometry? Preliminary results of an observational study

A. Fusco^{1,2}, L. Cretaro¹, M. Iosa², G. Morone², F. Margutti¹, F. Ioannilli¹
¹S. S. Lazio
²Movement and Brain Laboratory, Fondazione Santa Lucia I.R.C.C.S.

Introduction. The risk of a musculoskeletal injury is an unfavourable consequence in physical training. Many factors are involved in the predisposition to injury. Our purpose was to link measures of the skeletal length and of the leg circumferences, taken at the beginning of sport season, with various muscle lesions of lower limbs in the junior elite athletes. **Materials and methods.** Measures of the skeletal length and of the leg circumferences were collected for twenty junior football players (under 16-years-old) at the beginning of sport season. It has been conducted an observation of muscle lesions during the following six months. Pearson correlation coefficient (R) was evaluated between each limb measurements and day of rest due to the related limb injuries. **Results.** Fifteen athletes had at least one injury during the recorded period. Six of them had 2 injuries. Excluding a player who had a stop of 90 days (and considered as outlier), the other injuries implied a mean rest of 7 days. Positive, but not significant, correlation were found between thigh circumference at 10 cm (R=0.26, p=0.11) and 20 cm (R=0.20, p=0.22), and shank circumference at 15cm from inferior border of patella (R=0.14, p=0.39). No correlations were found with skeletal length measurements (R<0.1). However, the data were differently clustered between players with and without injuries. In the injured group, significant correlations were found between the thigh circumferences (R=0.48 at 10cm, R=0.52 at 20 cm, p<0.05 for both) and the days of rest. **Conclusion.** We cannot conclude that anthropometric measurements influences the possibility of an injury, but our results suggest that the period of rest after an injury could depend on some anthropometric measurements.

References

1. Maffey L, Emery C. What are the risk factors for groin strain injury in sport? A systematic review of the literature. *Sports Med* 2007;37(10):881-94.

Quality of life in disability: from rehabilitation to accessible tourism

D. Bonaiuti
Unità Operativa di Medicina Fisica e Riabilitazione, AO S.Gerardo Monza

In the beginning of the Third Millennium, people with neurological illnesses in Europe are more than 27% of all the population, with estimated costs of about four hundred thousand million of euros. Neurological illnesses are the origins of 35% of the total chronic disabilities and a disability perception strictly related with the "perceived quality of life". Social and medical problems in the Third Millennium are overall related to the existence of a lot of older, chronically disabled people, with degenerative, but clinically stable, illnesses and with a quality of life expectations that rehabilitation has to manage by radical changes in goals and exercise programs. Rehabilitation is the only therapeutic answer now useful to these subjects for whom the main problem is the disability, and their related changes in the quality of life, that should not justify an isolated way of life, also when they reached the daily activities living autonomy. At present, people with neurological chronic illnesses wanted to reach not only the daily activities living autonomy, but they wanted a better quality of life, travelling, playing and so on. These new patients' requests are the new goal for the rehabilitation. Therefore the rehabilitation needs to have the competences to manage complex symptoms and impairments and all the disabilities that influence the quality of life. And the Individual Rehabilitative Project has to focus the autonomy in the main activities outside the hospital and the outpatients settings: in the main field of the ICF Activities and Participation. These new concerns change the rehabilitative programs with more specific exercises and a new educational focus for the physiotherapists that have to teach with more motivation disabled people in their behaviour to prevent the inactivity and improve the Participation. This goal is more important for disabled people, (older and young people) because this is the main portion in the daily time: a fundamental to improve "the quality of life". So, the free time can be a new setting to know, improving people abilities with activities and exercises to propose daily, outside the conventional rehabilitative setting, with a people better motivated to the participation, travelling, playing sports, communicating, and enjoying arts and cultural activities.

Functioning of patients with breast cancer

H. Burger¹, N. Bešič²
¹University Rehabilitation Institute, Ljubljana, Slovenia
²Institute of Oncology, Ljubljana, Slovenia

Introduction. Breast cancer is the most frequent cancer among women. The treatment is determined according to the clinical stage and can consist of surgery, radiation and systemic therapy (chemotherapy, biological and hormone therapy). Patients suffer from problems in different areas of functioning because of the disease itself and the consequences of the treatment. To plan rehabilitation of these patients it is necessary to know which are the most frequent and disturbing impairments and limitations these patients have. The aim of our study was to find out which are the most frequent problems of these patients. **Materials and methods.** All women admitted to the Institute of Oncology, between January and June 2009 for first breast cancer operation. They filled in ICF brief core sets for breast cancer, WHODAS-II and EORTC QLQ BR-23 questionnaires. The same questionnaires have been sent to them again 3 month post operatively. **Results.** 87 patients 31 to 83 years old were included. On average, they had preoperative problems in 3 out of 11 areas for body functions, and 2 out of 11 activities and participation. The number of problems in both increased by 2 after surgery. Operation increased problems on 6 out of 7 subscales in the WHO-DAS-II questionnaire and worsened quality of 5 out of 8 quality of life areas. A greater decrease in all quality of life areas is observed in patients that have more problems in the functioning. **Conclusion.** Women with breast cancer have problems with functioning even prior to surgery. Postoperatively the number of problems increases. A greater decrease in quality of life is observed in patients that experience more problems in function. Rehabilitation would reduce their impact, and thereby improve quality of life.

Furlong hip arthroplasty: functional 7-year follow-up analysis of a patient population

A. Zambito¹, D. Bianchini¹, C. Dall'Oca², N. Smania¹, R. Aldegheri³

¹U.O. *Recupero e Rieducazione Funzionale Azienda Ospedaliera Universitaria Integrata Di Verona*

²Clinica Ortopedica Università di Verona

³Clinica Ortopedica Università di Padova

Introduction. We report functional results (HHS: Harris Hip Score) in a population of patients who were all operated by the same surgical team and who all underwent rehabilitation by the same physiotherapy team. **Materials and methods.** 205 biologically fixed hip arthroplasty implanted from 2000 to 2006 in 182 patients with mean age 60.5 years (range 13-87) were studied clinically over a follow-up period lasting from 1 to 7 years. In the population of patients who chose to have elective surgery, there was a high percentage of younger patients. The 'rehab' was mainly based on the lengthening of the muscles, whereas mobilization was dedicated to articular rigidity which is more important and particularly found in the younger patient. **Results.** Mean pre-operative HHS was 45.5, and then 94.85 at 1 year, and 98.8 at 7 years. We found 19 precocious complications: 7 cases of DVT (3.41%), 5 diaphyseal fractures of the femur during surgery (2.43%), 4 dislocations of the prosthesis (1.95%) and 3 cases of transitory palsy of the femoral nerve (1.46%). There were 6 late complications: the acetabular cup moved (2 cases; 0.97%), the acetabular cup migrated (1 case; 0.48%), the prosthesis moved after a diaphyseal fracture (1 case; 0.48%), the prosthetic head ruptured (1 case; 0.48%); and in 1 case the prosthesis was painful (0.48%). **Conclusion.** In this population of patients who chose to have elective surgery with this type of prosthesis and rehabilitation based only on 'stretching' the overall results after 7 years have been very good and in line with international literature

Analysis of the normal and modified gait in a population of healthy subjects

A. Zambito¹, P. Fumene Feruglio², C. Manganotti⁴, M. Bertagna⁴, P. Pernigo¹, G. Crimi⁴, N. Smania¹, A. Sbarbati², P. Bartolozzi³

¹U.O. *Medicina Fisica e Riabilitazione Azienda Ospedaliera di Verona*

²DSMB, *Sezione Anatomia e Istologia Università di Verona*

³Clinica Ortopedica Università di Verona

⁴Dipartimento Riabilitativo Ulss 20 Marzana

Anatomical bone modifications can cause a muscle force redistribution which is able to modify gait and posture, in particular by prosthesis implant. The goal of this study was to induce a reorganization of healthy subjects' body kinematic chain during walking by an alteration of forces of the hip muscles that can be assimilated to hip disorders. During gait, external loads, were alternately applied on the right hand in arm adducted and in 90 degree arm abducted positions. Before the gait trials a simplified biomechanical model was implemented to understand gait alterations with the employed loads. To quantify gait modifications, Time-distance parameters and kinematics variables have been taken into account. Both female and male subjects were investigated due to their anatomical differences. The conclusion of this study can be summarized as follows: both external loads induce a trunk inclination to compensate the loads; trunk inclination in the abducted position of the arm is double that of the adducted position; female trunk lateral slope and walking speed were always higher than that of the male likely to compensate hip muscle fatigue. worthy of remark is the new body configuration with carried loads similar to the Duchenne's walk in hip diseases. The theoretical biomechanical model fits data very well in the adducted case. These results provide a dataset which can be used as comparisons in pathological gaits studies.

Interferential and horizontal therapies in chronic low back pain due to multiple vertebral fractures: a randomized, double blind, clinical study

A. Zambito, D. Bianchini, D. Gatti, M. Rossini, S. Adami, O. Viapiana *Rheumatologic Rehabilitation, Valeggio s. Mincio Hospital, University of Verona, Italy*

Introduction. Multiple vertebral fractures almost invariably ensue in chronic low back pain that remains of difficult management. Electrical nerve stimulation is frequently used but its efficacy has

never been properly evaluated. **Material and methods.** One hundred and fifteen women with chronic back pain due to previous multiple vertebral osteoporotic fractures (CBPMF) were randomly assigned to either interferential currents (IFT), horizontal therapy (HT) or sham HT administered for 30 minutes daily for 5 days per week for two weeks together with a standard exercise program. Efficacy assessment was obtained at baseline and at week 2, 6 and 14 and included a functional questionnaire (Backill), the standard visual analog scale (VAS) and the mean analgesic consumption. **Results.** At week 2 a significant and similar improvement in both the VAS and Backill score was observed in the three groups. The two scores continued to improve in the two active groups with changes significantly ($p < 0.001$) greater than those observed in control patients at week 6 and 14. The use of analgesic medications improved only in the HT group. **Conclusion.** This randomized double-blind controlled study provides the first evidence that IFT and HT therapy are significantly effective in alleviating both pain and disability in patients with CBPMF.

Respiratory complications after orthotopic liver transplant

A.I. Hijas Gómez, M. Sevilla Benitez, C. Resino Luis, M. Ramos Solchaga, C. Abad Fernández, P. Gotor Ferrer

Hospital Universitario Puerta de Hierro Majadabonda

Introduction. Orthotopic liver transplant (OLT) is a complex surgery carry out in patients clinically deteriorated with a high risk of postoperative complications. Pulmonary complications are very frequent (60-70%), involving high morbidity and mortality. In 2008 we started a treatment program in order to avoid or to minimize these pulmonary complications after liver transplant. **Materials and methods.** We reviewed the medical records of 46 adult patients who underwent liver transplantation during 2008 and 2009. Cause of liver disease, smoking status, surgery duration, length of orotracheal intubation (IOT) and stay in the intensive care unit (ICU), pulmonary and extrapulmonary complications, mortality incidence, and physical treatment data were noted. **Results.** Pulmonary complications were detected in 37 patients (80, 4%), pleural effusion was the most frequent in 29 (63%), 6 of them (13%) needed to be evacuated with thoracentesis. Other complications as pneumonia (8.7%), atelectasia (4.3%), pneumothorax (2.2%) or acute respiratory distress syndrome (ARDS) (2.2%) were associated. Since ICU 37 patients started respiratory therapy (80.4%), and we also needed to add mobilizations and muscle strengthening in 7 patients (15.2%) who showed a significant loss of functional activity. Patient mortality was 17.4% (8 patients). **Conclusion.** The most frequent postoperative complication is pleural effusion that usually is solved with diuretics and respiratory therapy, however sometimes it requires to be evacuated by thoracic tube drainage. We must remember that these patients can present any type of complication due to their liver disease, immunosuppression, type of surgery, toxics (smoke and alcohol). A global and fast intervention with a standardized treatment is essential.

References

- Monge E, Fernandez-Quero L, Navia J. Complicaciones médicas postoperatorias precoces del trasplante ortotópico en adultos (I). *Rev Esp Anestesiología Reanim* 2002; 49: 529-540.
Hall JC, Tarala RA. Prevention of respiratory complications after abdominal surgery: a randomised clinical trial. *BMJ* 1996;312:148-53.

Left ventricular assist device; a step up for cardiac transplantation

A.I. Hijas Gómez, C. Resino Luis, M. Sevilla Benitez, M. Ramos Solchaga, J. Montilla Dominguez, N. Perez Fernandez

Hospital Universitario Puerta de Hierro Majadabonda

Introduction. Severe heart failure involves an important health problem. Progressively multiple devices have been developed to provide circulatory support to patients who suffer a severe ventricular dysfunction that compromise their life. Left ventricular assist devices (LVAD) practically imitate the function of the human heart, reestablish adequate cardiac output and are well established as a bridge to cardiac transplantation. **Materials and methods.** We describe our experience with three patients with severe heart failure who receive a LVAD as a bridge to cardiac transplantation, and the physical interventions we apply. **Results.** Three male patients, with ages between 31 and 46 years-old, were admitted to the hospital with severe ventricular dysfunction due to dilated cardiomyopathy. All of them

underwent insertion of a LVAD (Berlin-Heart Excor). After the surgery, patients were evaluated by a physical therapist, and treatments were initiated. In the intensive care unit (ICU), they received respiratory therapy. After transfer for the ICU, they started a training program which included breathing exercises and gait training with rolling walker. We controlled the intensity of the exercise by a scale of perceived effort (Borg's scale), and monitoring the arterial tension and the cardiac frequency. Sessions of 25 minutes-walking with an intensity among 2,5 to 3,5 METs were achieved with good tolerance. Finally, patients were transplanted. **Conclusion.** Ventricular assist devices, as the Berlin-Heart Excor, give a new opportunity to "terminal" patients who are waiting for a transplant. These patients are so deconditioned that an aggressive physical therapy intervention with an individualized treatment plan is essential.

References

Humphrey R: Exercise physiology in patients with left ventricular assist devices. *J Cardiopulm Rehabil.* 1997;17(2):73-5.
 Ueno A: Cardiac rehabilitation and artificial heart devices. *J Artif Organs.* 2009;12(2):90-7.
 Christiane S: Early Mobilization of LVAD Recipients. *Texas Heart Institute Journal,* 2006;3:130-133

Family with charcot-marie-tooth disease. Findings in gait analysis and treatment

V. Mani, N. Roussos, V. Aggeli, I. Sioutis, N. Lykos, C. Goumas, D. Patatoukas
PRM Department, "Asklepieion" General Hospital, Voula, Greece

Introduction. Charcot-Marie-Tooth disease (CMT) is a hereditary condition resulting in muscle weakness and changes to the mechanical properties of the foot. Impact on the foot is due to atrophy of the peroneal muscles. Incidence of the disease is 30/100.000. Progression is very slow and life expectancy virtually normal. Deformation combined with sensory impairment requires the use of customized insoles following pedobarogram. **Materials and methods.** Five members of the same family with CMT were studied. Two sisters aged 63 and 58, their brother aged 61 and the two sons of the women, aged 40 and 35 respectively. Static and dynamic gait analyses as well as photographic scans of all the patients were studied. After the study, a treatment with physiotherapy, exercise and use of special insoles were recommended. **Results.** All the examined patients were presenting high arches (pes cavus) with evidence of hyperkeratosis under the heads of the metatarsal bones, especially the 5th. The 63 year old woman had started suffering from ulceration and was treading only on the forefoot. Four out of five were presenting a completely missing longitudinal arch in one or both feet. Lack of toe imprint was present in 4 out of five. In dynamic gait analysis, the elder were presenting a decrease of gait length and major instability, but everyone was walking with the line of load transferred towards the inner edge of the foot. There was a significant encumbrance of the heads of the metatarsal bones, especially the 1st and 5th. Customized insoles were prescribed to all the patients after the pedobarogram. **Conclusion.** All patients had a significant improvement to pain while walking. The elder patients increased their length and speed of gait, which became less painful. Earlier adoption of foot insoles improves the quality of walking, making it painless and functional.

Does treadmill and partial body weight support training reduce time of gait recovery after stroke?

S. Bargellesi, C. Brescacin, S. Scapolan, F. Faliero
UO Medicina Riabilitativa- Unità Gravi Cerebrolesioni, Ospedale Riabilitativo di Alta Specializzazione, Motta di Livenza (TV)

Introduction. The demand of an early gait recovery after stroke leads to new approaches like using Body Weight Support (BWS) on a treadmill. Walking training on treadmill with BWS, as a Task oriented rehabilitation, is intended to improve the coordination of motor activity and to promote symmetric activity of lower limb giving a postural support. The aim of this study was to investigate if BWS and treadmill training, combined with conventional physiotherapy, can accelerate gait restoration compared to conventional physiotherapy alone. **Materials and methods.** Eight hemiparetic patients, not later than 120 days from the stroke, with TCT not less than 60/100, and FAC level 0, were divided by a random selection into BWS group and Control group. The target was the achievement of FAC 1 and we measured the time needed to reach the goal. **Results.** The

BWS group takes average 18,5, median 20 days to reach FAC's first level while Control group takes average 46,25, median 45, days. **Conclusion.** BWS and treadmill training combined with conventional physiotherapy allows starting precociously gait rehabilitation and seems to accelerate gait recovery after stroke. We can say that BWS is an effective integration to conventional physiotherapy, even if studies with larger groups are needed.

References

1. McCrea David, Rybak Ilya (2008), Organization of mammalian locomotor rhythm and pattern generator, *Brain Res. Reviews;* 57 (1).
 2. Visintin M. et al. (1998), A new approach to retrain gait in stroke patients through body weight support and treadmill stimulation, *Stroke,* 29.
 3. Nilsson L., et al (2001), Walking training of patients with hemiparesis at an early stage after stroke: a comparison of walking training on treadmill with body weight support and walking training on the ground, *Clinical Rehabilitation,* 15.
 4. Moseley A. et al (2003), Treadmill training and body weight support for walking after stroke, *Stroke* 34.

Neuropsychiatric disorders in patients with severe Traumatic Brain Injury (TBI): prevalence, phenomenology and relationship with clinical and functional features

P. Ciurli¹, R. Formisano¹, U. Bivona¹, A. Cantagallo², P. Angelelli³
¹*IRCCS Santa Lucia Foundation, Rome, Italy;*
²*Department of Neuroscience/Rehabilitation, Hospital and University of Ferrara, Italy;*
³*Department of Psychology, University of Bari, Italy;*

Introduction. Neuropsychiatric sequelae are widely reported TBI patients, and their presence and persistence often have deleterious effects on recovery and rehabilitation outcomes. Furthermore, neuropsychiatric symptoms, including disorders of cognition, mood, motivation and behavior¹, appear to have an important role in shaping long-term outcomes, particularly those related to family and social reintegration and return to work^{2,3}. The aim of this study was to characterize neuropsychiatric symptomatology in a large group of individuals with severe Traumatic Brain Injury (TBI) and to correlate these symptoms with demographic, clinical and functional features. **Materials and methods.** The Neuropsychiatric Inventory (NPI)⁴, a frequently used scale to assess behavioral, emotional and motivational disorders in patients suffering from neurological diseases, was administered to a sample of 120 people with severe TBI. Controls were 77 healthy subjects. **Results.** A wide range of neuropsychiatric symptoms was found in the severe TBI population: apathy (42%), irritability (37%), dysphoria/depressed mood (29%), disinhibition (28%), eating disturbances (27%) and agitation (24%). A clear relationship was also found with demographic (age), clinical (chronicity), and functional (GOS score) variables. **Conclusion.** Neuropsychiatric disorders constitute an important part of the comorbidity in severe TBI populations. Our study emphasizes the importance of integrating an overall assessment of cognitive disturbances with a specific neuropsychiatric evaluation to improve clinical understanding and treatment of TBI cases.

References

1. Rao V, Lyketsos C. Neuropsychiatric Sequelae of Traumatic Brain Injury. *Psychosomatics.* 2000;41(2):95-103.
 2. Lippert-Gruener M, Wedekind Ch, Klug N. Functional and psychosocial outcome one year after brain injury and early onset rehabilitation therapy. *Journal of Rehabilitation Medicine.* 2002;34:211-214.
 3. Warriner EM, Velikonja D., Psychiatric Disturbances After Traumatic Brain Injury. *Neurobehavioral and Personality Changes Current Psychiatry Reports.* 2006;8:73-80.
 4. Cummings JL, Mega M, Gray K, Rosemberg-Thompson S, Gornbein J. The Neuropsychiatric Inventory: comprehensive assessment of psychopathology in dementia. *Neurology.* 1994;44:2308-2314.

Driving with disability: from idea to realization

E. Skikic-Mujic, P.H. Khadse, S. Trebinjac, P. Richardson
Rashid Hospital, Dubai, Emirates Driving Institute, Dubai

Introduction. With the aim of improving quality of life and independence for disabled persons, the idea came of establishing a proper and harmonized program for disabled driving, realized the necessity of comprehensive team work, communication between rehabilitation professionals, training centre for driving, road-traffic authorities and vehicle adaptation facilities for successful implementation. Medical assessment is essential to evaluate adequate operation-

nal, cognitive and higher executive functions of the driver and possible vehicle adaptations. **Materials and methods.** Preparation started as a Project between Rashid Hospital, Emirates Driving Institute (EDI), Road and Traffic Authorities (RTA), Swed Adaptation and Arabian Automobiles in February 2009. Step by step implementation of hand adapted car within EDI, training for instructors, development of assessment tools for off road assessment, establishing proper channel of communication with key contact persons within involved institutions. All clients were assessed off-road for functional abilities, screening and testing on simulator and on -road assessment was performed if it was required. **Results.** For the period of 10 months there were 81 disabled candidates who enquired about the procedure in EDI. In Rashid Hospital 18 patients were assessed by physiatrist and occupational therapist for driving abilities and medical report was issued. 12 patients were registered for driving classes in EDI and from them 6 disabled persons passed the road test. **Conclusion.** To achieve the goal of driving with disability and improve independency and quality of life for physically disabled persons, good team work and active participation of all team members is required. This process needs to be implemented step-by-step, starting with physical disability and continuing with more complex medical conditions with all required legislative rules and regulations.

References

Redepinning S, Driver Rehabilitation Across Age And Disability: An Occupational Therapy Guide; 2006.
 Yale S, Hansotia P, Knapp D, Ehrfurth J; Neurologic | Conditions: assessing Medical Fitness to Drive; Clinical Medicine & Research, Volume 1, Number 3:177-188.
 Heikkila VM, Kaillanranta T, Evaluation of the driving ability in disabled persons: a practitioners' view; Disability Rehabilitation 2005 Sep 2:27(17):1029-36.

Comparison between 2 VS (Vegetative State) populations: cerebrovascular accident (CVA) and anoxic brain injury (ABI). Clinical and rehabilitative profiles

C. Perin^{1,2}, C. Cornaggia^{1,2}, V. Rega², D. Ruiu², C. Cerri¹

¹Università degli Studi Milano-Bicocca
²Istituti Clinici Zucchi Carate Brianza

Introduction. There are no definite suggestions on the cognitive rehabilitation approach (see the Royal College-Physicians-raccomandation)(1) for CVA and ABI VS(40% of total VS)(2).Monitoring of VS CVA and ABI patients has been perform to:-**aim1**-identify different cognitive and clinical features; **-aim2**-verify possible different responses to sensory stimulation; **-aim3**-investigate correlations between neuropsychoneurophysiological and bio-humoral variables.**-aim4**-verify if there is a more suitable cognitive scale to monitor CVA/ABI patients. **Materials and methods.** VS CVA and ABI patients were assessed (4 month observation period) (inclusion criteria by Giacino)(3) at the basal(T0)and final time(T1):- Cognitive scales(CS):JFKComaRecoveryScale-Revised,Coma-Near-ComaScale (CNC),WesternNeuroSensoryStimulationProfile(WNSSP), InnsbruckComaScale(ICS), - BasalEEG, -PO2,BMI,Hb,Albumin. At the Intermediate T (Tint): PO2,BMI,Hb,Albumin. Rehabilitation treatment: 1h/die motor and CPAP fkt and 1h/die psycho-sensory stimulation. Statistical Analysis: Mann-Whitney U test to Compare CS total scores at T0,T1 and delta T1-T0.Spearman rank correlation between the cognitive scale scores and bio-humoral parameters (mean of values T0-Tint-T1), between cognitive scales and EEG. **Results.** 11 CVA [4, 7] and 10 ABI [1, 9] were recruited. Bio-humoral parameters and Cognitive assessment: no statistically significant differences were highlighted(aim-1-). For correlation indexes between CS and EEG: WSNNP-attention (WNSSPA)subitem correlates with the EEG evidence: WNSSPA score 0-3→EEG:very scarce electrical activity =10sbjct; WNSSPA score 5-7→EEG: slow aspecific activity ,Continuous generalized slowing, Intermittent generalized pattern =11sbjct. Spearman coeff (r= -.200)p>0.05. No correlations between cognitive and bio-humoral parameters values were found (aim-3-). **Conclusion.** ABI and CVA have a scarce recovery and response to sensory stimulation (aim-2) according to literature (4). WNSSP seems highlight variabilities in the cognitive response(aim-4-). Further analysis to assess VS are requested to evaluate whether the patient can show response to stimulation, according to the recent evidence that VS patients could have fMRI-brain activation reflecting some awareness and cognition(5).

References

1. Royal-College of Physician- London:20031
 2. Bates D; Neuropsychol-Rehabil-2005;15:175-183,
 3. GiacinoJT et al; Neurology2002;58-249,
 4. GrahamDI et al; Neuropsychol-Rehabil-2005;15:198-213; 5-Monti et al, NEJM 2010;3.

Results of complex rehabilitation treatment in patients with ankylosing spondylitis

I.-R. Marcu, S. Patru, A. Bighea, R. Popescu
 University of Medicine and Pharmacy Craiova

Introduction. Quality of life studies in patients with ankylosing spondylitis attest to its significant impact on day to day activities and social interactions. The aim of this study was to assess the efficacy of complex rehabilitation treatment and its influence on the clinical and functional status of these patients. **Material and methods.** The study included 138 patients with ankylosing spondylitis, mean age 41,52±11,63 years, randomized function of the treatment in 3 lots: medication lot (56 patients), exercise lot (41 patients) and the studied lot with complex rehabilitation treatment (41 patients). The patients were clinical, biological and functional evaluated at the beginning of the study, after 3 months, 6 months and 12 months. **Results.** The efficacy of physical-kinetic treatment is reflected by statistically significant improvements (p<0.05) of scores for BASFI (Bath Ankylosing Spondylitis Functional Index), HAQ (Health Assessment Questionnaire), spinal and peripheral joints mobility, muscular force and decrease of lumbosacral pain on a visual analogue scale. The minimal number of patients we need to treat for 52 weeks (number needed to treat- NNT) to prevent the quality of life decrease for one of them was 4 in the studied lot with complex rehabilitation treatment and 6 for the control lot with kinotherapy. We also established the profile of the patient with ankylosing spondylitis with a maximal response at the physical- kinetic therapy. **Conclusion.** The improvement of the clinical and functional parameters has a significant impact on their quality of life.

References

Dougados M, Dijkmans B, Khan M, Maksymowich W, et al. Conventional treatments for ankylosing spondylitis. Ann Rheum Dis 2002; 61 (Suppl III): iii40- iii50.

Gait modification after 2 years of rehabilitation treatment for the child with cerebral palsy

D. Caimac, R. Marcu, P. Simona, E. Rosulescu, Z. Mihaela
 ????

Introduction. Abnormalities of gait and ambulation are the main complain for the caregivers and families of the children with spastic cerebral palsy. **Aim.** This study was designed to investigate the long-term effects of rehabilitation program on gait for the children with cerebral palsy. **Patients and methods.** This study included children with spastic cerebral palsy (CP), (divided in two groups: studied group and control group), evaluations were made before starting the rehabilitation (0), after 1 year (1) and after 2 year (2), using Gross Motor Functional Measurement **88-66** (GMFM), Gross Motor Function Classification System (GMFCS). We study the efficiency of rehabilitation treatment standard that include 50 minutes exercise training and physiotherapy program, four times per week, for 2 years (ideal maximum was 208 session/year), for 66 children (divided in two groups studied group and control group). 14 participants withdraw from our study for various reasons before the end of the second year. **Conclusion.** The impact of rehabilitation program on the gross motor abilities and the evaluation using the GMFM scale at the end of the study notice statistic medium differences between the two groups (difference median CI%65, p<0,05) the score of GMFM T3 and T1 was more evident, with the increase of gross motor abilities (for the study groups **7.1 (4.7:9.4)** different for the control group **3.8 (1.8:5.8)**).

Effects of physical-kinetic therapy on quality of life in patients with psoriatic arthritis

I.-R. Marcu, S. Patru, C. Visarion Danut
 University of Medicine and Pharmacy Craiova, Romania

Introduction. Approaching the patient with psoriatic arthritis (AP) depends on the clinical form and the associated dermatoses. The main purpose of the management of these patients is to ensure a normal and independent living and an appropriated quality of life. In this context we considered it appropriate to evaluate the effectiveness of evolution of the score for Health Assessment Questionnaire (HAQ). **Material and method.** The study included 94 patients, 54% men, divided in three groups comparable in gender, residence, duration of psoriatic arthritis and of psoriasis, age, disease

characteristics, smoking; two control lot with drug therapy (32 patients), respectively with kinotherapy (26 subjects) and a test lot with procedures and exercises (36 patients). Average age of the patients was 45.3 ± 6.21 years, mean duration of AP 15.5 ± 8.75 years and of psoriasis 20.11 ± 9.7 years. All patients were evaluated clinical and functional at the initiation of the study, after 3 months, 6 months and one year. **Results.** HAQ dynamics during the 12 months reveals a positive change especially in the physical-kinetic therapy group. Based on HAQ indicator we calculated the minimum number of patients to be treated for 52 weeks to prevent decreasing the quality of life in at least one of them: 2 in the lot with physical-kinetic therapy and 3 in the lot with kinotherapy. Bath Ankylosing Spondylitis Functional Index (BASFI) influence on HAQ improvement is well above 50%; there is a correlation between indicators estimated as moderately high (0.8). **Conclusion.** The results show the contribution of complex physical kinetic therapy to increasing the quality of life for patients with psoriatic arthritis.

Osteoporosis in patients with early ankylosing spondylitis

I.-R. Marcu, S. Patru, O. Rogoveanu, R. Popescu
University of Medicine and Pharmacy Craiova, Romania

Introduction. Osteoporosis is a well-recognized feature of ankylosing spondylitis (AS), as well as of other inflammatory rheumatic diseases. **Aim.** To determine total body and regional bone mineral density (BMD) in a cohort of patients with early AS. **Material and methods.** Thirty-three patients (26 males and 7 premenopausal women) with early AS, mean age 33.62 ± 10.5 years were evaluated regarding lumbar spine and total hip BMD by dual energy X-ray absorptiometry (DEXA). Total body measurements were done with the same device and the results were compared with 33 sex and age-matched controls. **Results.** In patients with early AS, BMD was reduced in both lumbar spine (T score -1.15 ± 1.52) and total hip (T score -0.71 ± 0.95) as compared with controls (T score 0.13 ± 1.12 , respectively 1.33 ± 0.41 , all $p < 0.05$). Total body BMD was also significantly lower in AS patients ($p < 0.05$) and it was correlated with spine BMD ($r = 0.70$; $p = 0.00523$) but not with total hip BMD. Lumbar spine BMD was also correlated with disease duration; no significant correlation was found between BMD at any site and biological markers of disease activity (erythrocyte sedimentation rate and C-reactive protein serum levels). **Conclusion.** We found spine osteopenia or osteoporosis in 51.43% patients, while 32% had hip osteopenia and none had hip osteoporosis. AS is associated with generalized bone loss that occurs early in the disease course.

Decannulation procedures after serious brain injuries

M. Mackiewicz-Milewska¹, H. Mackiewicz-Nartowicz², S. Lach-Inszczak¹, A. Sinkiewicz², W. Hagner¹

¹*Department of Rehabilitation, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University*

²*Department of Phoniatry and Voice Rehabilitation, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University*

Introduction. The aim of our study was to analyze factors that may influence positive decannulation in patients with tracheotomy performed because of the traumatic brain injury, stroke or cardiac arrest. **Materials and methods.** Our material includes 127 patients hospitalized in the Department of Rehabilitation. All of them had tracheotomy performed before the admission. The effect of several factors on success of decannulation was analyzed. We estimated age, sex, cause of hospitalization (brain injury, stroke, cardiac arrest), GCS scale in case of trauma, duration of tracheotomy, tracheotomy complications, concomitant diseases. Laryngological examination – endoscopic examination of the larynx and trachea was conducted to qualify patients for decannulation. To analyze our data a χ^2 test, and in case of small groups χ^2 test in Yates modification were used. The analyses involved the comparison of decannulation and the factors. **Results.** A successful decannulation was performed in 40 out of 127 patients i.e. 31.5. We found a positive correlation between age, cause of hospitalization, duration of tracheotomy and decannulation. Most of decannulated patients were less than 40 years old. 33 patients out of 74 hospitalised because of the brain injury were successfully decannulated. The duration of tracheotomy was from 1 week to 389 weeks. We confirmed that long term tracheotomy results in decannulation difficulties. The other factors did not influenced on decannulation. **Conclusion.** 1. In the analyzed group, the most suc-

cessful decannulations were observed in patients below 40 years of age after a traumatic brain injury. 2. Time interval from tracheotomy until decannulation has a significant influence on decannulation.

References

1. Goldenberg D et al. Tracheotomy complications: a retrospective study of 1130 cases. *Otolaryngol Head Neck Surg* 2000;123: 495-500.
2. Richard I et al. Tracheotomie et traumatisme crânien grave: pour qui? Pourquoi? Quand? Comment? *Ann Fr. Anesth. Reanim* 2005; 24 : 659-62

Heterotopic ossification after hypoxic brain damage.

M. Mackiewicz-Milewska¹, S. Jung², S. Borland², S. Lach-Inszczak¹, I. Szymkuć¹, J. Cieściński³, W. Hagner¹, W. Lasek³

¹*Department of Rehabilitation, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University Bydgoszcz, Poland*

²*Trauma and Orthopaedics, South Tyneside Hospital, South Shields, United Kingdom*

³*Dept of Radiology and Diagnostic Imaging, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University Bydgoszcz, Poland*

Introduction. Heterotopic ossification is the formation of osseous masses in the soft tissues where it does not normally occur. It can cause severe stiffness of joints. The aetiology may be posttraumatic, neurogenic or genetic. We aim to assess the development of heterotopic ossification in patients who suffer hypoxic brain injury, and look at the impact on the rehabilitation process. **Materials and methods.** We identified 39 patients who developed hypoxic brain injury after cardiac arrest. We assessed the conscious level, spasticity and joint stiffness. We diagnosed those who developed heterotopic calcification using clinical examination, blood markers and X-ray imaging. Those who had X ray findings of heterotopic calcification were further assessed by CT scan. **Results.** In 39 patients, 6 developed heterotopic calcification (15%). The cause of cardiac arrest varied. We found that in those patients with heterotopic calcification, there was increased pain at the site, with increased stiffness of the joint involved. The commonest joints involved were the hip, elbow and shoulder. 3 patients had multiple joints involved. **Conclusion.** Heterotopic ossification can occur in up to 15% of patients following hypoxic brain injury. It can lead to increased pain in joints on movement and can prolong the rehabilitation process of the patient

References

1. K.G. Chua, K.H. Kong Acquired heterotopic ossification in the settings of cerebral anoxia and alternative therapy: two cases brain Injury, 2003; 17, (6)535-544.
2. E. Malamed, D. Robinson, N. Halperin and all. Brain injury-related heterotopic bone formation: treatment strategy and results. *Am.J Phys med Rehabil*, 2002,81, 99), 670-674.

Construct validity of the ICF Core Set for Osteoarthritis by Rasch analysis: can it be used as a measuring tool?

S. Kutlay¹, Y. Kurtais Aytür¹, A.A. Kucukdeveci¹, D. Oztuna², M. Hafiz¹, A. Tennant³

¹*University of Ankara, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Turkey*

²*University of Ankara, Faculty of Medicine, Department of Biostatistics, Turkey*

³*University of Leeds, Faculty of Medicine and Health, Department of Rehabilitation Medicine, UK*

Introduction. This study aimed to investigate the construct validity of the ICF Comprehensive Core Set for osteoarthritis (OA) in order to test its possible use as a measuring tool for functioning. **Materials and methods.** 100 consecutive patients with OA (84 F, 16 M; mean age 63 yr) completed forms including demographic and clinical information besides The Short Form (36) Health Survey (SF-36®) and the Western Ontario and McMaster Universities Index of Osteoarthritis (WOMAC). Health professionals completed the ICF Core Set for OA by interview. The internal construct validities of "Body Functions-Body structures" (BF-BS), "Activity-Participation" (AP) and "Environmental" (E) domains were tested by Rasch analysis and reliability by internal consistency and person separation index (PSI). External construct validity was evaluated by correlating the Rasch transformed scores with SF-36 and WOMAC. **Results.** After rescoring of some items showing disordered thresholds and deleting some items that did not fit to the Rasch model, the internal construct validities of the three scales (BF-BS 16 items, AP 13 items, E 17 items) were good [values of mean item fit (SD) were 0.022 (1.028), 0.040 (1.303) and -0.146 (0.936); those of person item fit (SD) were -

0.150 (0.646), -0.327 (1.184) and -0.121 (0.624)], indicating a single underlying construct for each scale. Post-hoc tests showed that each set of items showed strict unidimensionality. The scales were largely free of differential item functioning (DIF) for age, gender, years of education and duration of disease. Reliabilities of the BF-BS and AP scales were good with Cronbach's alphas of 0.80, 0.89 and PSI's of 0.87, 0.91, respectively. Rasch scores of BF-BS and AP showed moderate correlations with SF-36 and WOMAC scores as expected. **Conclusion.** The BF-BS and AP scales derived from the ICF Core Set for OA has been shown to be valid and reliable by Rasch analysis and might be used as a clinical assessment tool.

A Randomised Controlled Clinical Trial Comparing Two Different Types Of Transcutaneous Electrical Nerve Stimulation (TENS) With Gabapentin In Neuropathic Pain

A. Dicle Turhanoglu, E. Okuyucu, H. Güler, A. Mansuroglu, C. Ozer
Mustafa Kemal University, Medicine School

Introduction. The aim of the study is to evaluate the efficacy of transcutaneous nerve stimulation therapy in the patients with neuropathic pain. **Materials and methods.** Fifty two patients with neuropathic pain were randomized into three groups. The patients receive (n=16) gabapentin in first group, conventional TENS in second group (n=18), and, acu-TENS in third group (n=18). Visual Analog Scale (VAS) and Leeds Assessment of Neuropathic Symptoms and Signs(LANSS) scores were used to assess pain and, SF-36 to assess quality of life (QoL). TENS were administered forty minutes per day, for five days in a week, in a three weeks period. Pain and QoL were assessed before and after treatment, after a week and a month later. Percentage changes in VAS, LANSS and SF-36 scores were calculated and compared between the groups. **Results.** Three groups were similar with respect to sex-distribution, age, pain period, pain intensity, and QoL. Mean decline of VAS score were 30.40±17.72%, in gabapentin group, 44.93±23.96 % in conventional TENS group, and 28.75±23.96 % in acu-TENS group. At the end of one month mean changes were %50.33±21.52 in gabapentin group, %53.46±27.48 in conventional TENS group, and %44.70±28.64 in acu-TENS group. SF-36 scores were elevated in both groups in all visits. **Conclusion.** In one month period after treatment there is a regression in pain and an increase in QoL in patients who were performed conventional and acu-TENS treatment just similar with patients taking drug therapy. As a conclusion TENS may be an alternative of medical treatment in neuropathic pain.

The RTRC Chronic Fatigue Programme

R. Weller

Royal Talbot Rehabilitation Centre, Melbourne, Australia

Introduction. Chronic Fatigue Syndrome (CFS) is a disabling condition affecting up to 3% of the population; its aetiology is unknown and there is no specific treatment. Increasing numbers of referrals resulted in the establishment in late 2004 of a dedicated 6 week OP therapy programme at the Royal Talbot Rehabilitation Centre (RTRC) in Melbourne, Australia for patients with the condition. **Materials and methods.** The programme is based on supervised graded exercise and the Stanford Chronic Disease Self-Management Programme, the latter as a surrogate for individual Cognitive Behavioural Therapy. In response to patient concerns about the programme intensity, relapse rates and following discussions with services in UK and Belgium, this was changed to a 12 week programme from Sept 2008. The programme structure and content will be described, along with outcome data collected thus far. Approximately 200 patients have been referred since the programme's inception, but of these, only 109 have completed the programme. Reasons for non participation will be described, and in particular, criteria for identifying patients likely to drop out after commencement of the programme will be explored. **Conclusion.** CFS is a common condition and can be responsible for significant disability. Outpatient rehabilitation based on graded exercise and teaching patients self-management strategies is effective in managing CFS. Screening for patients likely to reject the programme can assist with planning therapy programmes and reducing "wastage". More research is necessary to identify risk factors for relapse after programme completion.

Modulated Midfrequency Electrotherapy as Treatment Modality of Acute Low Back Pain: a Pilot Study.

E. Atabas

Practice of Physical and Rehabilitation Medicine, Bonn, Germany

Introduction. Low back pain is usually associated with high muscle tonus in the erector spinae muscle which can be measured by superficial electromyography (EMG). Modulated midfrequency electrotherapy (MET) can be used to regulate muscle tonus and therefore reduce painful conditions in the lower back. Our goal was to investigate if 20 minutes of modulated midfrequency electrotherapy has an immediate effect on muscle tonus and pain sensation. **Materials and methods.** In this pilot study 20 subjects (mean age 46,7±14,74) suffering from low back pain received MET. Before and after treatment, EMG of the erector spinae in the segment L5 was measured. Additionally subjective sensation of low back pain was evaluated by a visual analogue scale (VAS) with a range from 0 to 10. The inclusion criteria was acute low back pain. Exclusion criteria included leg pain, pregnancy, neuromuscular and neurological disorders, muscle atrophy and pacemaker. **Results.** We could observe a reduction of muscle tonus from 11±3,13 to 6,48±3,07 micro volt (p<0,001). The mean VAS-score could be reduced from 6,8±1,39 to 3,7±1,3 (p<0,0001). **Conclusion.** We could observe that MET reduces pathological high muscle tone in the erector spinae muscle and also shows an observable benefit regarding pain sensation evaluated by the patients themselves. Comparative studies with different kinds of treatment modalities are in progress in order to evaluate and verify these observations.

Comparison of ultrasound (US)-guided intra-articular injections on the three different sites of the knee

Yong Bum Park, Dong Woo Lee

Department of Physical Medicine & Rehabilitation, Sanggye Paik Hospital, Inje University College of Medicine, South Korea

Introduction. The purpose of this study was to compare the accuracy rate of the ultrasound (US)-guided intra-articular(IA) injections on the three different sites of the knee using medial, lateral, superolateral portals.^{1), 2)} **Materials and methods.** In the study, the ultrasound (US)-guided intra-articular(IA) injection was performed on 79 knees with radiographically confirmed knee osteoarthritis (Kellgren/Lawrence grade 2 or 3). Totally 5ml-mixed material of 1% lidocaine(4ml) and contrast dye(1ml) was injected into the intra-articular space of knee joint using medial, lateral and superolateral portals. After an US-guided IA injection into the knee joint, a radiographic image was taken to ascertain whether the injected material had reached only to the intra-articular space or infiltrated to the soft tissue. **Results.** Accuracy rate of the US-guided IA injection on lateral portal(96%) or on superolateral portal(100%) of the knee was statistically significantly higher than injection on medial portal(76%). (p<0.05). **Conclusion.** An US-guided IA injection on lateral or superolateral portal may raise the accuracy rate in knee joint injections.

References

1. Jackson DW, Evans NA, Thomas BM. Accuracy of needle placement into the intra-articular space of the knee. *J Bone Joint Surg Am* 2002; 84:1522-1527.
2. Bianchi S, Zamorani MP. US-guided interventional procedures. In: Bianchi S, Martinoli C (eds). *Ultrasound of the Musculoskeletal System*. 1st ed. Berlin, Heidelberg: Springer; 2007:891-917.

A New Method of Ultrasound-guided Intra-articular Injections in the Knee through the Suprapatellar Bursa

Yong Bum Park, Dong Woo Lee

Department of Physical Medicine & Rehabilitation, Sanggye Paik Hospital, Inje University College of Medicine, South Korea

Introduction. The purpose of this study was to develop and assess a new method of ultrasound (US)-guided intra-articular injections in the knee through a suprapatellar bursa.^{1), 2)} **Materials and methods.** In the study, examination was performed on 99 patients with radiographically confirmed knee osteoarthritis (Kellgren/Lawrence grade 2 or 3) without an effusion and 40 normal controls. After US-guided or blind injection of hyaluronic acid (HA) and contrast dye through the suprapatellar bursa into the knee joint, a radiographic image was made to ascertain whether the injected material had reached the intra-articular space. 40 normal controls were ex-

mined by US to test if the suprapatellar bursa was discernable. **Results.** The suprapatellar bursa was evident on US in all 40 normal controls. An US-guided injection of HA into the knee joint exhibited a significantly greater accuracy rate (97.8%) than a blind injection (84.1%). **Conclusion.** Intra-articular injections through the suprapatellar bursa using US-guidance may raise the accuracy rate in knee joint injections.

References

1. Qvistgaard E, Kristoffersen H, Terslev L, Danneskiold-Samsøe B, Torp-Pedersen S, Bliddal H. Guidance by ultrasound of intra-articular injections in the knee and hip joints. *Osteoarthritis Cartilage* 2001; 9:512-517.
2. Sambrook PN, Champion GD, Browne CD et al. Corticosteroid injection for osteoarthritis of the knee: peripatellar compared to intra-articular route. *Clin Exp Rheumatol.* 1989; 7:609-613.

Therapeutic non-pharmacological approach to reduce risks of falling in osteoporotic outpatients older than 70 years

D.M. Carlucci^{1,2}, G. Zanardi^{1,2}, P. Chiodera², V. Coiro^{1,2}

¹Specialization School In Medical Hydrology
²Graduate School In Physical Exercise And Sport Sciences, University of Parma, Parma, Italy.

Introduction. Postural instability, scant dynamic equilibrium(1), reduced muscle strength and ambulatory speed(2), high degree of dorsal kyphosis(3) and serum levels of 25-hydroxyvitamin-D<30ng/ml(4) are predictive of risks of falling. **Purpose.** The possibility to modify some predictive factors by changing way of life. **Materials and methods.** We studied 135(age>70yrs) osteoporotic outpatients(femoral bone-mineral-density(BMD)=T score<-2.5)with serum levels of 25-hydroxyvitaminD<30ng/ml, without invalidating osteoarticular diseases. Subjects were randomly divided into three groups: Group A underwent 7000IUvit-D treatment plus hydrokinesitherapy in bicarbonate-sulphate-calcium mineral water (at 36C°-37C°) ("Zellino Spring of Agriturismo Thermae"-Monterenzio, Bologna-Italy) 3-times/week for 6-months. Group B underwent hydrokinesitherapy without vit-D treatment. Group C did not receive any treatments. At recruitment(time 0) and 6 months later, we evaluated BMD, serum vit-D, subjective symptoms of pain and dynamic tests of spinal column function:Walking Test("Up and Go Timed Test"); "finger-flat distance"Test. Statistical analysis: Paired-and Unpaired-StudentT-tests. **Results.** BMD did not change at time 6 months vs time 0 in any group. At 6 months, serum vit-D levels were lower than 30ng/ml in GroupB and C, whereas they were higher in Group A. Subjective symptoms of pain and dynamic tests showed significant improvements at time 6 months vs time 0 in Groups A and B, but not in Group C. Improvements were significantly higher in Group A than in Group B. **Conclusion.** Hydrokinesitherapy reduced pain and the examined predictive factors of falling. The association of both vit-D and hydrokinesitherapy was more effective than hydrokinesitherapy alone in improving walking autonomy.

References

1. Tinetti MF.et al.(1988).N. Engl. J. Med. 319:p.1701-1707.
2. Cummings SR.et al.(1995).N. Engl. J. Med. 332:p.767-773.
3. Sinaki M. et al.(2005).Osteoporos Int. 16:p.1004-1010.
4. Bischoff-Ferrari HA.et al.(2004) JAMA 291:p.1999-2006.

Effect of Lidocaine Iontophoresis on Pain during Needle EMG

A. Morchow, T. Annaswamy
 University of Texa, Southwestern Medical Center at Dallas (sponsor)
 Veterans Affairs (VA) Medical Center, Dallas (study site)

Introduction. Patients often report acute pain associated with the needle electromyography (EMG) exam. This research study was designed to test the hypothesis that lidocaine iontophoresis applied prior to the needle EMG exam will mitigate the pain experienced during the EMG exam. There have been multiple studies examining various techniques to reduce pain during needle EMG, but none of these studies have looked at lidocaine iontophoresis for this purpose. **Materials and methods.** There were a total of 14 subjects that participated in this randomized double-blinded, placebo-controlled study. All subjects had been referred to the VA Hospital EMG clinic for evaluation of bilateral upper extremity symptoms. A total of 40 mA-min of transdermal lidocaine 4% was administered using iontophoresis over the left opponens muscle. Both left and right oppo-

nens muscles were then tested using a monopolar needle. Immediately following the EMG, subjects completed a questionnaire asking them to rate the pain they experienced at the two tested sites and choose a preference for iontophoresis prior to the needle EMG exam. Normal saline iontophoresis was used for placebo. No subjects withdrew from the study. **Results.** Seven participants received lidocaine 4% in the iontophoresis electrode lead. Five participants in this active group indicated a decreased Visual Analog Scale (VAS) pain score on the treated side. A total of ten subjects in the study reported a preference for iontophoresis prior to undergoing needle EMG. We calculated, with a 95% confidence interval, that there was a decreased in pain when iontophoresis was used prior to the needle EMG exam. However, there was no significant difference between the active and placebo groups. **Conclusion.** From the data, we can conclude that there was an apparent placebo effect by the presence of iontophoresis on pain reduction in needle EMG. Further studies are needed to determine if lidocaine iontophoresis actually affects pain perception in needle EMG and if it would be beneficial to use in the clinical setting.

Neuroplasticity after Spinal Cord Injury: effects of a walking training

E. Bizzarini¹, C. Pinzini¹, C. Urgesi^{3,4}, G. De Maio¹, M. Maieron³, S. D'Agostini², C. De Colle², B. Tomasino⁴, L. Weis³, P. Cappellaro¹, A. Zampa¹

¹Department of Rehabilitation Medicine, Spinal Unit, SPINAL, IMFR, Udine, Italy
²Department of Radiologic Sciences S. Maria della Misericordia University General Hospital, Udine, Italy
³Department of Biomedical Sciences and Technologies and Department of Philosophy, University of Udine, Udine, Italy
⁴Scientific Institute Eugenio Medea, Udine, Italy

Introduction. Aim of the study was to test the effects of a walking training using Body Weight Supported Treadmill (BWST) and Functional Electrical Stimulation (FES) in complete spinal cord injured (SCI) patients. **Materials and methods.** Participants: 8 thoracic level SCI patients, age 33,36±1,14 years, Asia Impairment Scale A. Material: PO22 Stimulator Fequa and BiacMed systems were used for FES walking. The training was realized in four steps: 1) Patterned Electrical Stimulation (PES) assisted isometric exercises for quadriceps muscles, 5 sessions/week for 3 weeks; 2) FES cycling, 3 times/week for 3 weeks; 3) FES walking at BWST (TR Spacetrainer), 3 times/week for 3 weeks; 4) over-ground FES walking training, 3 times/week for 4 weeks. At every steps of the training we tested 1) quadriceps isometric torque with isokinetic dynamometer during contraction induced by electrical stimulation; 2) O₂ maximal consumption during stress test and energetic cost of gait with respiratory gases analyzer (VO2000, Medgraphics-USA); 3) post-training changes of motor activations during observation and imagery of lower and upper limb movements with fMRI (Siemens AVANTO, 1,5 Tesla). **Results.** At the end of the training we verified an increase of quadriceps torque (from 19.6 to 42.7 Nm x m), of walking speed (from 0.09 to 0.20 m/s) and of aerobic performance, with a decrease of energetic cost of gait (from 32.94 to 30.28 J/Kg/m). FMRI results showed increased activations of visual as well as of motor and premotor areas during observation and imagery of lower limb movements. **Conclusion.**

Our finding confirm that inputs as BWST and FES realize in SCI patients physiologic and metabolic benefits and, more interestingly, that they can guide cortical plastic changes.

References

- Hotz-Boendermaker S., Funk M., Summers P. et al. Preservation of motor programs in paraplegics as demonstrated by attempted and imagined foot movements. *Neuroimage* 2008; 39:383-94.

Influence of exercise training before coronary artery bypass surgery on in-hospital perioperative complications

H. Branea, C. Streian, I. Gyalai, M.C. Tomescu
 Cardiology Clinic City Hospital Timisoara Romania, Cardiovascular Surgery Clinic, Timisoara Romania

Introduction. Open heart surgery implies specific complications due to extracorporeal circulation, laminary atelectasis, thromboembolic risk, neuromediator imbalance and mood disorders. Exercise

training antagonizes these mechanisms medium term after surgery so we tried to determine its acute effects if sustained intervention is performed before intervention. **Materials and methods.** Over a 8-year period, 40 patients already undergoing supervised phase III exercise training after acute myocardial infarction required CABG surgery (study group). We investigated the incidence of perioperative AMI, stroke, thromboembolic events, respiratory infections, severe depression/anxiety and also mortality and duration of ICU stay and hospital admission. These data were compared to a control group of 66 consecutive patients with minimal physical activity prior to intervention, comparable in terms of risk factors and severity of the disease (mean age, sex, weight, BP, DM, systolic function and number of grafts). **Results.** Mortality, perioperative AMI and stroke were comparable in both groups (5%-study vs 4.5%-control NS; 7.5% study vs 10% control NS, 7.5% study vs 7.5% control NS respectively). Thromboembolic events, respiratory infections and severe mood disorders were reduced in the study group (2.5% study vs 4.5% control $p=0.04$; 5% study vs 12% control $p=0.01$; 17.5% study vs 22.5% control $p=0.03$). As a result, the hospitalization period decreased from mean 9.8 ± 0.8 days (control) to 8.3 ± 0.8 days (study group) - $p=0.04$ as well as the ICU stay from mean 29 ± 1.3 hours to 22 ± 1.5 hours - $p=0.03$. **Conclusion.** Patients performing exercise training before CABG surgery had fewer in-hospital complications, leading to reduced need for hospital care.

Role of general practitioners in rehabilitation after heart surgery

H. Branea, I. Tatar, I. Gyalai, M. Tomescu
Cardiology Clinic, City Hospital Timisoara, Romania

Introduction. Only a few patients can perform long term cardiac rehabilitation in a specialized unit. The general practitioner is the closest healthcare professional to them. Many general practices are well endowed for noninvasive cardiology, including treadmill and cycloergometer for exercise training. We explored the feasibility of phase III cardiac rehabilitation in general practices. **Materials and methods.** We studied 80 multivessel CHD patients after CABG with 34 performing controlled, phase III exercise training for at least 12 mo in 4 general practices in Caras Severin County, Romania. They were mostly males (86%) with mean age 58 ± 7 yrs, and EF $>40\%$. We used cycloergometry, treadmill and circuit walking for 30-40 min, 3-5 times/week to 70% of VO₂ max or maximum HR as determined in previous effort testing in a rehabilitation clinic. Long term compliance was 41%, the rest of the patients formed the control group. Frequent 6 min walk tests were performed as well as various noninvasive cardiological investigation, with referral for control angiography if complications were suspected. **Results.** No deaths occurred in both groups, in 1-4 yrs of follow up. The study group had better effort capacity (effort duration 19,6 vs 12,1min $p<0.01$, walk test distance 488 vs 352min $p<0.01$ rest HR 74 vs 86 bpm $p<0.01$ and max HR 154 vs 148 bpm $p<0.05$). There were no significant differences in CHD complication rate. However, the trends were towards better anginal threshold in the exercise group (18% admissions VS 12% in the control group) and towards worse rhythm disturbance rate (24% admissions in the control group). Admissions for heart failure episodes were similar (12%). **Conclusion.** Long term cardiac rehabilitation was feasible and safe in the general practices, in multivessel CHD patients after successful revascularization. There were clear benefits in effort capacity and quality of life with no additional medium term risk (1-4 yrs).

Electrical stimulation would be an alternative to rehabilitation training in patients with Peripheral arterial diseases (PAD)

M. Nagasaka¹, P. Dobsak², K. Muroya¹, N. Mori¹, S. Ebihara¹, H. Kurosawa¹, O. Ito¹, M. Kohzuki¹

¹The Department of Internal Medicine and Rehabilitation Science, Tohoku University Graduate School of Medicine

²The Department of Functional Diagnostics and Rehabilitation Sci. Anna Faculty Hospital and Masaryk University

Introduction. Peripheral arterial diseases (PAD) are occlusive arterial disease of the lower limbs and lead to intermittent claudication. The lower limbs on PAD display changes characteristic not only of chronic ischemia, but also of muscle disuse. This fact means that aerobic energy production is impaired, oxidative enzyme capacity is

decreased and fiber atrophy is induced in the muscle fiber on PAD. Low-frequency electrical stimulation (LFES) of the skeletal muscles has been shown to increase blood flow and oxidative enzyme activity, to enhance muscular regeneration, and to prevent atrophy. The aim of this study was to investigate whether electrical stimulation of skeletal muscles could increase blood flow and represent an alternative rehabilitation method for patients with PAD. **Materials and methods.** A men aged 67 years old with stable PAD, Fontane class II and ankle brachial pressure index (ABI) 0.75 was studied. He had 26 weeks of home-based low-frequency electrical stimulation (LFES) applied simultaneously to the quadriceps and calf muscles (1 h/day for 7 days/week). After the 4, 8, 12, 16, 26 week period, dynamometry was performed to determine blood flow, muscle power and exercise tolerance. Moreover, blood pressure and heart rate were measured before and after LFES to examine the safety of LFES. **Results.** 26 weeks of LFES increased blood flow and muscle power. However VO₂ max did not increase. Blood pressure and heart rate did not change after LFES. **Conclusion.** LFES improved blood flow and muscle strength. But LFES did not improve exercise tolerance. Moreover LFES could be confirmed for the safety of patients with PAD. Therefore LFES could be recommended for an alternative rehabilitation method in patients with PAD.

References

Dobsak P et al: Low-Frequency Electrical stimulation increases muscle strength and improves blood supply in patients with chronic heart failure *Circ J* 2006;70:75-82.

Neuropathic pain in idiopathic carpal tunnel syndrome: the relationships between clinical, electrophysiological findings and disability

E. Cetinkaya, A. Karagoz, H. Rana Erdem, B. Nacir, H. Genc
Ministry of Health, Ankara Training and Research Hospital, 2nd Department of Physical Medicine and Rehabilitation

Introduction. The aim of the study was to evaluate the neuropathic pain component in idiopathic carpal tunnel syndrome (CTS) and its relation with clinical, electrophysiological findings and disability. **Materials and methods.** Ninety-nine patients with electrophysiologically diagnosed CTS were included. Demographic parameters, pain severity and duration of symptoms were recorded. CTS provocation tests and clinical examination of median nerve were performed. Disability was assessed with Disability of the Arm Shoulder and Hand questionnaire (DASH) and Boston Carpal Tunnel Questionnaire (BCTQ). Electrophysiological grading was done as described by Padua et al. The Douleur Neuropathique en 4 questions (DN4) was used to select patients with neuropathic pain, and the Neuropathic Pain Symptom Inventory (NPSI) to assess the intensity of the various qualities of neuropathic pain. **Results.** CTS was detected in 176 of 198 hands (154 bilateral, 22 unilateral). One hundred-two hands with CTS (47 bilateral, 8 unilateral) had neuropathic pain. Seventy-four hands with CTS (30 bilateral, 14 unilateral CTS) didn't have neuropathic pain. NCS data didn't differ between groups ($p>0.05$). The mean age, body mass index (BMI), pain duration, phalen's sign, square wrist sign showed no differences but severity of pain, tinnel's sign, the tethered median nerve stress test, pressure provocation test, tourniquet test, DASH and BCTQ showed statistically significant differences between two groups ($p<0.01$ to $p<0.001$). Abductor pollicis brevis muscle weakness and decreased hand grip values were found in neuropathic pain group ($p<0.01$). Paresthesia/dysesthesia were found to be more prominent symptoms of neuropathic pain in CTS. **Conclusion.** In this study, we found that more than half of the CTS patients had neuropathic pain. Pain severity and functional disability were severe in patients with neuropathic pain. Because patients with neuropathic pain may benefit from specific treatments, it is important to distinguish the neuropathic pain component in the way of therapeutic approach.

Severe osteoporosis: synergic action between pharmacological and rehabilitative treatment

G. Barbera, G. Cardona, L. Lauricella, M. F. Pisano, P. Cataldo, G. Letizia Mauro

Università degli Studi di Palermo, Cattedra di Medicina Fisica e Riabilitativa

Introduction. Osteoporosis is a metabolic pathology of bone, with a multifactorial pathogenesis and a high incidence rate. The

main complication is the fracture. Parathyroid hormone has been recently introduced in the therapeutic scheme. Its daily subcutaneous administration induces just a temporary increase of the serum levels, producing, through a strong anabolizing effect, an increased bone formation as a primary effect. **Materials and methods.** 50 women with severe osteoporosis had been enrolled at the Division of Physical Therapy and Rehabilitation of Palermo University since July 2006. This diagnosis was established carrying out clinical evaluation, instrumental examinations (BMD and radiography of the dorsolumbar rachis) and blood tests. Patients were subjected to a treatment including one daily injection of 20 micrograms of parathyroid hormone (along 18 months), sessions of magnetotherapy and then a personalized rehabilitation program, whose goals were the maintenance of paravertebral muscles tone and trophism and the improvement of respiratory function and postural control. The clinical evaluation has been performed at the base examination (To), at 4 weeks (T1) and 18 months (T2). In addition to the traditional Visual Analogue Scale (VAS), used to quantify the algic symptomatology, we have administered the SF-36 questionnaire to assess quality of life. **Results.** At the end of every treatment, we observed a remarkable decrease of pain, a good drug compliance and a gradual return to the ADL. Besides, a check-up BMD was performed, showing an unchanged T-score than the previous one. **Conclusion.** Pharmaceutical treatment in association with magnetotherapy and therapeutic exercise seems to be the most useful approach in terms of reduction of pain and improvement of quality of life.

References

1. S. Adami et altri: Linee guida per la diagnosi, prevenzione e terapia dell'osteoporosi. Reumatismo 2009.
2. Aldo Vasta. Manuale clinico di terapia fisica. Edizioni Minerva medica 2007.

Tecar-therapy in the low back pain in acute phase: our experience

G. Sanguedolce, C. Venza, M. L. De Luca, F. Scaglia, N. Di Bella, G. Letizia Mauro

Università degli Studi di Palermo, Cattedra di Medicina Fisica e Riabilitativa

Introduction. The term “sciatic syndrome” or lumbar radicular pain, is used to describe the limb pain which prevails in the territory of the sciatic nerve distribution with or without neurological deficits. It interests people aged between 30 and 50 years, especially man; risk activities are above all stress of lumbar extensors (repeated movements of spine, lifting and twist, postural stress and poor or inadequate muscular strength). **Materials and methods.** A population of 28 persons having lumbar radicular pain from herniated disc, treated with a conservative way, was divided into two groups: the Group A (average age: 46,5 years- 6 females and 9 male) has been subjected to physical therapy combined (Ionophoresis, TENS, and laser-therapy), while group B (average age 48,2 years, 6 FEMALES and 7 male) was treated with Tecar. Two groups were assessed using the VAS scale for pain, Aberdeen Low Back Pain Scale and the Barthel to determine the quality of life. **Results.** The clinical assessment at the end of rehabilitative treatment showed an improvement in terms of reducing the painful symptoms and restoring functional autonomy for patients in group B, which have achieved those objectives already from first sittings. **Conclusion.** The therapeutic rational of the tecar-therapy is to slow down and change the biological processes that are the basis of tissutal damage, through stimulation of energy from tissues, activating natural repair and anti-inflammatory processes.

References

1. Luijsterburg PA, Verhagen AP, Ostelo RW, van Os TA, Peul WC, Koes BW. Effectiveness of conservative treatments for the lumbosacral radicular syndrome: a systematic review. Eur Spine J. 2007;16(7):881-899.
2. Rhee JM, Schaufele M, Abdu WA. Radiculopathy and the herniated lumbar disc. Controversies regarding pathophysiology and management J Bone Joint Surg Am. 2006;88(9):2070-2080.

Case-control study in an integrated treatment of gonarthrosis using magnetotherapy and therapeutic exercise VS the same treatment in association with endo-articular injections

L. Lauricella, G. Barbera, G. Cardona, E. Geraci, G. Letizia Mauro
Università degli Studi di Palermo, Cattedra di Medicina Fisica e Riabilitativa

Introduction. Gonarthrosis is a chronic degenerative arthropathy of bone and articular components. From a clinical point of view, it's characterized by pain, which is often localized to the anterior or anteromedial surfaces of the knee. We can also observe functional deficit, movement limitation, deambulation problems and difficulties to go up and down the stairs. The aim of our study was to evaluate the effectiveness, both in terms of pain reduction and functional recovery, of an integrated therapeutic protocol with magnetotherapy and therapeutic exercise VS the same treatment in association with endo-articular injections of low-molecular-weight hyaluronic acid in patients affected by I°-II° gonarthrosis. **Materials and methods.** We enrolled 30 patients, whose age is between 50 and 65 years old, suffering from gonarthrosis not responding to pharmacological treatment. These patients were recruited at the Division of Physical Therapy and Rehabilitation of Palermo University between September and December 2009. These patients were randomly divided into two groups: the A (n=15) followed a rehabilitation protocol including magnetotherapy and functional re-education; the B (n=15) received the same therapy in association with endo-articular injections of hyaluronic acid. Clinical assessment was performed, for both groups, at the base examination, at 4 weeks and at 8 weeks. In addition to the traditional VAS, used to quantify the algic symptomatology, we carried out an articular and functional assessment through the Lequesne Algo Functional Index. **Results.** At the end of rehabilitation treatment, the best results, in terms of pain decrease and functional recovery, have been observed in the group B. **Conclusion.** A rehabilitation protocol, that integrate physical therapy, therapeutic exercise, visco-induction and visco-supplementation, determine a significant improvement of pain and an increase of the articular excursion.

References

1. Aldo Vasta. Manuale clinico di terapia fisica. Edizioni Minerva medica 2007.
2. Giorgio Nino Valobra. Trattato di Medicina Fisica e Riabilitazione, 2007 UTET.

Our experience in the rehabilitation of fractures of the upper ankle

N. Stojanovic, B. Katancevic, D. Veljkovic, S. Golubovic, T. Matejevic
Special hospital for rehabilitation Ribarska Spa, Serbia

Introduction. Ankle fractures are the most common injuries of the locomotor apparatus. Numerous classification impede saving and confuse doctors. But should have a doctrinal attitude. For this purpose we analyzed 277 who were injured in medical rehabilitation in our institution from 2004 to 2009, using statistical data from internal documents. **Materials and methods.** Statistical material obtained structural data are as follows:

Length of rehabilitation of 10 - 15 day s	76 (27%)
of 16 - 35 days	118 (42%)
after 35 days.....	85 (31%)
The youngest patient was 15, and the oldest 86 years.	
Women were more numerous and represented 65%.	
With the malleolus medialis fracture	11 (4%)
maleleous lateralis	35 (13%)
bimalleolaris	104 (38%)
trimalleolaris	112 (40%)

Operation was treated 79 (29%). The surprising fact of late referral to the stationary medical rehabilitation, which can be seen from the following facts:

60 to 120 days	81 (29%)
121 to 180 days	80 (29%)
6 - 12 months	44 (14%)
and the other after a year.	

Result. All were first rehabilitated in our institution except for 6 patients. Results of treatment were presented to the following categories:

trained for the work	133 (48%)
trained to work with additional outpatient rehabilitation	78 (28%)
prepared for everyday activities or change job	66 (24%).

The stationary medical rehabilitation are referred to those with more severe injuries of the upper ankle. Some of them outpatient rehabilitation. Treatment of these injuries is difficult not only because of the necessary consolidation of the fracture, but due to sanction violations ligaments device, which is often neglected. **Conclusion.** Adequate orthopedic treatment, early and continuous rehabilitation of sufficient duration, in cooperation with the orthopedist, allows the establishment of the functions of the upper ankle and prevents later static - dynamic changes in ankle joint, but also on foot.

Algodystrophic Syndrome and in loco-typico fractures

B. Katancevic, N. Stojanovic, D. Veljkovic, S. Golubovic, T. Matejevic
Special hospital for rehabilitation Ribarska Spa, Serbia

Introduction. The main goal of balneotherapy is to prevent or, if it has already occurred to treat the algodystrophic syndrome (ADS) whose main clinical manifestations are: swelling, post-traumatic tissue infiltration, movement-related pain, ankle contracture, muscle fibrosis and atrophy, inactive atrophy and osteoporosis, etc. All this is due to the long-term immobilization of the part of the locomotory apparatus following bone fracture. **Materials and methods.** Annual statistics of patients treated in our hospital is as follows: patients suffering from contracture after the fracture (26,4%), and contracture due to other injuries, mainly thigh fracture (15,6%). We have selected 47 patients who have been in the last two years treated for wrist fracture in loco typico due to fall (78,7%) and a car accident (21,3%), considering that these fractures are mainly treated conservatively. Average treatment duration amounted to 24 days. Previously 21 patient (44,7%) have been rehabilitated in the ambulatory care, and six patients (12,8%), have been treated in the hospital for the second time. **Results.** The opponents to the plaster immobilization, i.e. to the conservative treatment, can rarely suggest anything better for the majority of fractures. After all, the cause of the ADS is not immobilization solely, but also the improper plaster immobilization or the extension, additional orthopedic manipulation, delayed early orthopedic and rehabilitation treatment, etc. **Conclusion.** Proper early orthopedic treatment, early mobilization of the injured extremity and the organism as a whole are the basic prevention of the ADS.

Osteoporosis in Men

Ulku Akarirmak

Istanbul University Cerrahpaşa Medical Faculty PMR

Osteoporosis in men. Osteoporosis research mainly concentrates on female osteoporosis. However 30% of the patients consist of men. A man over 50 has a one in four lifetime risk of having an osteoporotic fracture. Hip fracture rates in male patients keep increasing all over the world. By 2025, number of hip fractures in men will equal current number of hip fractures in women. Mortality in men following hip fracture is nearly twice as high as in women. Peak bone mass, cortical thickness, trabecular width and volume are higher in men. Thinning trabecula result in perforation in females, but trabecular thickness preserves trabecular number for a longer time in men. Estrogen hormone is as important as testosterone in the pathogenesis of male osteoporosis. There is an important correlation between estrogen and bone density. DXA is the gold standard for diagnosis of osteoporosis. The diagnostic criteria for osteoporosis of the WHO for women can be applied to men over 50 years of age. Femoral neck, femoral total or spinal (L1-L4) T-scores below (-2,5 SD) according to male reference values denote osteoporosis in men. Secondary osteoporosis has to be frequently addressed in male osteoporosis. About 40% of men have secondary osteoporosis with hypogonadism, corticosteroids and a high alcohol intake being the leading causes. Low testosterone levels, RA, prostate cancer, GIS disorders may be responsible for osteoporosis. Patients over 70 years of age are defined as senile osteoporosis. Patients without secondary osteoporosis are classified as idiopathic. Alendronate, Risedronate, Zoledronate and Parathyroid Hormone are the medical agents approved for the treatment of male osteoporosis. Nonpharmacologic interventions are important in the management of osteoporosis as well. All patients have to receive the adequate daily doses of calcium and Vitamin D. Prevention of falls, life style modifications, exercises (strengthening, posture, coordination) are issues to be addressed.

Possibilities of neuroplasticity stimulation after surgical treatment of carpal tunnel

C. Milicin¹, M. Dragoi^{1,2}, T. Hoinoiu¹, R.G. Dragoi¹, G. Noditi¹, D. Nemes^{1,2}

¹University of Medicine and Pharmacy "Victor Babeş" Timișoara

²Emergency City Hospital Timișoara, Medical Rehabilitation Clinic

Introduction. Taking into account the fact that the peripheral motor nerves are the only nerves from the central nervous system which can regenerate themselves after axotomy, the objective of our study was the analysis of some possibilities of stimulation of

neural regeneration, with eventually potential of neuroplasticity. **Materials and methods.** The study analysed 12 patients, with ages between 37 and 58, separated in 3 groups with 4 patients, each of them, after surgical treatment of carpal tunnel syndrome. It has been used the following therapeutically protocol: application of **ultra-sounds** (on the regions innervated by the affected median nerve roots), applications of **thermotherapy (fango)**, **electrical stimulation** with exponential impulses of the partial or total denervated muscles, preceded by the electrical diagnosis with determination of I/t curve and of the alpha accommodation coefficient. The patients were evaluated at the beginning and the ending of each rehabilitation cure regarding: muscular strength, evaluation of sensitivity, alpha accommodation coefficient, inverted Dreiser functional index of the hand, the speed of sensitive and motor nervous conduction. **Results.** Analyzing the parameters obtained we found that in the groups 1 and 3 the lesions were of axonotmesis and neurapraxia with rapid and beneficial evolution of the patients, the functionality of the upper limb, the speed of nervous conduction and in the group 2 the lesions were at the limit between axonotmesis and neurotmesis with the improving of the parameters mentioned before but not so marked as it is in the groups 1 and 3. **Conclusion.** The rehabilitation procedures used in the protocol have the capacity to accelerate the neuroplasticity, this fact being confirmed by the evolution of the patients from the groups 1 and 3 whom lesions were of axonotmesis and respectively neurapraxia.

References

- Schmelzer RE, Della Rocca GJ, Caplin DA (2006). Endoscopic carpal tunnel release: a review of 753 cases in 486 patients. *Plast Reconstr Surg* 117 (1): 177-85.
- Nemes IDA, Dragoi M, Moldovan C, Gheorghe I, Tiberiu T (2000). Ghid de electroterapie si fototerapie, Ed. Orizonturi Universitare, Timisoara, ISBN 973-8109-02-7

Does human gait exhibit comparable and reproducible long-range autocorrelations on level ground and on treadmill?

B. Bollens², F. Crevecoeur³, V. Nguyen², C. Detrembleur¹, T. Lejeune^{1,2}

¹Université Catholique de Louvain, Rehabilitation and Physical Medicine Unit, Brussels, Belgium

²Université Catholique de Louvain, Cliniques universitaires Saint-Luc, Physical and Rehabilitation Medicine Department, Brussels, Belgium

³Université Catholique de Louvain, Center for Systems Engineering and Applied Mechanics (CESAME), Louvain School of Engineering, Louvain-la-Neuve, Belgium

Introduction. Stride duration of young healthy subjects fluctuates over the long-term in a very complex way. The presence of long-range autocorrelations among these fluctuations has already been highly suggested for subjects walking on level ground¹, but the mathematical methods used among studies are variable. Moreover, despite the frequent use of a treadmill in rehabilitation, the presence of such autocorrelations was nearly exclusively assessed during level-ground walking. The first aim of this study was to detect the presence of long-range autocorrelations during level-ground walking with a high level of evidence. The second aim was to challenge the persistence and the reproducibility of the results during treadmill walking. **Materials and methods.** Stride duration fluctuations of ten young healthy subjects were first assessed on a 37m-long track, using an integrated approach that combines rescaled range analysis and power spectral analysis². Next, the same walking test was performed twice on a treadmill, in order to test the persistence and the reproducibility of the results obtained during treadmill walking. **Results.** The outcomes of this study confirm with a high level of evidence that long-range autocorrelations are present among stride duration variability on level ground. The persistence and the reproducibility of the results during treadmill walking also validate the use of the treadmill to assess the long-term fluctuations of human gait. **Conclusion.** These conclusions widen the current fields of gait analysis. The assessment of long-range autocorrelations could be combined with other gait parameters traditionally measured on a treadmill in order to improve our understanding of normal and pathological gaits and to enhance our knowledge pertaining to motor control.

References

- Hausdorff JM. Is walking a random walk? Evidence for long-range correlations in stride interval of human gait. *J.Appl.Physiol.*1995.
- Rangarajan D. Integrated approach to the assessment of long range correlation in time series data. *Physical review E* 2000.

Dynamic Postural Control

D. Cooper, E. Antoniuk

*Sunny Hill Health Centre for Children
Slocan Street, Vancouver British Columbia, Canada,*

Seating and positioning to optimize our clients full potential can present significant challenges as the needs of the client become more complex. In our workplace we see clients with varying levels of seating needs but for this presentation we will be addressing those children at a GMFCS level of 4 or 5. We find that with the decrease in functional level, the controls within the seating systems become more complex and more restrictive. Adding too few components for the needs of the client on a seating system, can result in minimal correction and again, reduced function. It is challenging in these cases to balance the need for support with the freedom to move. Over the last few years more equipment has become available to deal with children with movement disorders as we recognize that static seating does not benefit these clients. Studies on various aspects of dynamic seating support the benefits of allowing movement. One of the more comprehensive studies being done in Italy, with clients with dystonic tetraplegia. At Sunny Hill Health Centre for Children, we have been applying dynamic systems to seating problems for approximately 10 years as a method of reducing the negative effects of rigid seating and to improve function in various applications. We first started with spring loaded back supports and have built slowly into headrests, footrests, armrests, knee supports and lateral tilt systems. We have also used dynamic systems with clients demonstrating self stimulating movement issues with significant success. Lateral tilt is useful for a variety of reasons when dealing with persons with severe neuromuscular disabilities for postural changes and to assist with gastrointestinal problems.

Abnormal activation of knee and ankle flexors-extensors is related to altered gait in ankylosing spondylitis?

E. Carraro¹, Z. Sawacha², S. Del Din², F. Spolaor², A. Guiotto², A.R. Gravina¹, R. Guglielmin¹, C. Cobelli², S. Masiero¹

¹Department of Rehabilitation, University of Padova, Padova, Italy

²Department of Information Engineering, University of Padova, Padova, Italy

Introduction. Ankylosing Spondylitis (AS) is a rheumatic disease that predominantly affects axial joints, producing a rigid spine from the occiput to the sacrum. AS patients could experience a progressive spinal kyphosis, from a biomechanical point of view this may induce a forward and downward displacement of the centre of mass (COM) in the sagittal plane [1]. Even though there is a clinical evidence of an altered posture, only one previous study involving AS EMG during gait, have been reported [2]. This study was aimed at examining abnormal EMG patterns of AS subjects, evaluating the role played in AS gait pattern alterations. **Materials and methods.** We recruited 14 AS subjects (age: 49±1 years, BMI: 25±3 Kg). Six cameras BTS motion capture system (60-120 Hz) and surface EMG (PocketEMG, 16 channels) synchronized with 2 Bertec force plates (FP4060-10) were used. 3D-motion analysis of independent barefoot walking was conducted. Surface electromyographic (EMG) data of rectus femoris (RF), tibialis anterior (TA) and gastrocnemius medialis (GM) muscles were collected; hips, knees and ankles flexion-extension moments and ground reaction forces were evaluated. **Results.** RF signals were prolonged at initial contact and non activation was registered during terminal stance and initial swing phases, TA activity was delayed during swing, GM muscle always showed a delayed activation during the stance phase. An increased ankle dorsiflexion and knee flexion, a decreased hip extension moments were registered at heel strike, together with an excessive posterior and a lower vertical force. **Conclusion.** Our data confirm delays in GM activation as in [3]; the presence of co-contractions in GM and TA could be related to the kinetic alterations and the lack of heel rocker, due to difficulties in accomplishing the shock absorption.

References

1. Bot SDM et al., Rheumatology 1999;38:441-43.
2. De Filippis LG et al., Reumatismo 2006;58(2):132-7.

Rehabilitation of a girl with Opsoclonus-myoclonus syndrome: case report

B. Marjanović, D. Stevanović-Papić, V. Šolaja, D. Dragič, G. Mirković
Institute for rehabilitation "Dr M. Zotović" Banja Luka, Republic of Srpska, BiH

Objective. Opsoclonus –myoclonus syndrome infantile mioclonic encephalopathy, ataxia, rare condition with caotic movement eyes, asinchronous myoclonus movements, without deficit consciousness, EEG- regular. **Case.** Girl, 2.5 years old, directed to psychiatrist because of unstable walk and tremor. The girl is from the first, regular pregnancy, delivered in the period, in natural way. Early psychophysical development proceeded properly. On clinical examination were found ataxic walk with support, hypotonic muscles, rough intentional tremor and asymmetry, no tendon reflexes are not provoked. The girl was immediately sent to the Pediatric Clinic, where were made CT and NMR of brain / findings regular, the EEG recorded a less severe dysfunction and light irritation changes. Because of the unexplained etiology, the girl was sent to the Institute for the child and mother in Belgrade (IMD), where was made NMR of chest and abdomen, NAD in order to exclusion neuroblastoma. Corticosteroid therapy was involved and after improvement, were suggested immunoglobulin therapy IVIG. The girl was included in rehabilitation program, the treatment by Bobath concept, where there has been achieved a safer sitting, kneeling and standing balance in the wider base. **Conclusion:** In conclusion we can say that the rehabilitation process is long and that with medicament therapy leads to clinical improvement and prolongation of emergence of neurological deficit. **Key Words:** Opsoclonus-myoclonus syndrome, medicament and rehabilitation therapy.

Correlation between clinical and laboratory measures in chronic stroke subjects

E. Carraro¹, Z. Sawacha², A. Guiotto², P. Contessa², S. Del Din², C. Cobelli², S. Masiero¹

¹Department of Rehabilitation, University of Padova, Padova, Italy

²Department of Information Engineering, University of Padova, Padova, Italy

Introduction. Stroke is the interruption of blood supply to the brain, causing oxygen and nutrients supplies cut off. It may lead to brain damages and severe mobility impairments, such as stability impairment. This study aimed at verifying the relation among clinical and laboratory measures of balance and investigating their usefulness. **Materials and methods.** Roemberg test was performed on 10 stroke (S) subjects (age: 69.4±8.2 years, BMI: 25.2±2.5 Kg/m²) and 10 control (C) subjects (age: 61.6±8.6 years, BMI: 27.3±2.2 Kg/m²), with eyes open (EO) and closed (EC). The centre of pressure sway area (SA), ellipse containing 95% of the data (E), path (CoP) and velocity (CoPv) (anteroposterior (AP) and mediolateral (ML) directions) were computed [1] (Matlab). The Tinetti Balance (TB); Berg Balance Test (BBT); and Time up and go Test (TUG) [2] were administered to S group. S and C groups were compared with the Student t-test. Pearson Correlation coefficient was computed between instrumental and clinical parameters (SPSS). **Results.** Mean balance scale scores of S subjects were respectively: 13.4±3.6 for TB, 45.7±14.5 for BBT, 29.3 s for TUG. Some clinical and instrumental parameters were correlated: BBT with CoPv parameters in EC, CoP path AP and CoPv AP in EO; TUG with CoPv parameters and SA, both in EO (but not CoPv ML) and EC, CoP path AP in EO. Significant differences were found between S and C in all CoP parameters in EO, but only in CoP path and CoPv in AP direction in EC. **Conclusion.** Only some clinical and instrumental assessments were related, indicating that they might measure different aspects of balance. Some balance alterations were related to visual condition. Balance analysis should be pursued considering both measurements.

References

1. L. Chiari et al. Gait and Posture. 12:225-234,2000.
2. SL. Patterson et al., Arch Phys Med Rehabil. 88:115-9,2007.

Job stress and health professionals: a clinical trial about a tertiary intervention for the stress management

B. Corrado, F. De Marco, V. Barletta, C. Servodio Iammarrone
University of Naples "Federico II", Dpt. of Surgery, Orthopedics and Rehabilitation

Introduction. In recent years the issues related to job stress have acquired a particular relevance. The job stress can be defined as a set of physical and emotional negative reactions that occurs when the demands posed by the work are not commensurate with the skills, resources or needs of the worker. Work-related stress can adversely affect health and even cause injuries. The objective of this trial is to evaluate the effect of a tertiary intervention, a cycle of acupuncture

sessions implemented on health professionals employed at the AUP "Federico II" of Naples. **Materials and methods.** 36 subjects (30 females and 6 males, with an average age of 51 years), all employees of the AUP "Federico II" of Naples, who complained of clinical symptoms attributable to stress conditions, underwent a cycle of acupuncture, which provided 10 sessions lasting 30 minutes each one. All the patients have been evaluated by means of EUROQoL and Pain-VAS at T0 (initial assessment), T1 (middle assessment) and T2 (final assessment). **Results.** The EUROQoL generated 36 different profiles of health. By comparing the frequency distributions of the profiles in the three times, we can see that there is a shift in frequency to the profiles whose score is closest to 1, which represents the improving health and quality of life. The Pain Vas showed an average improvement of 46,25%. **Conclusion.** The initial hypothesis that following a tertiary intervention it's possible to observe an improvement of the health status quality perception from the part of the worker, who has symptoms of job stress, is confirmed by this study.

References

1. NIOSH Publication No. 99-101 - "Stress at work", 1999.
2. Guida allo stress legato all'attività lavorativa. Commissione europea - Direzione generale Occupazione e affari sociali - Unit D.6, 1999.
3. Selye H. Confusion and controversy in the stress field. J. human. Stress 1975;2:37-44.

Calcification of the ligamentum flavum as a rare cause of lumbar spinal stenosis. Case report

S. Amorim; S. Toste; S. Magalhães; J. Macedo; A. Trêpa

Centro Hospitalar do Porto, Hospital Geral de Santo António

Introduction. Calcification of the ligamentum flavum is a disease which results in calcium pyrophosphate dihydrate crystal deposition in the ligamentum flavum and which sometimes causes radiculomyelopathy and spinal stenosis. It has been described almost exclusively in Japanese people. The cause of this calcification formation is far from being understood. It is probable that biochemical disorders, cause calcification. We report the case of a Caucasian man who presented with a remarkable low back pain associated with lumbar calcified ligamentum flavum. **Case Report.** A 46 years-old male followed in our clinics for a post-traumatic centromedular syndrome, with remarkable improvement from ASIA C to ASIA D after one year of rehabilitation. Five years later he referred a progressive mechanical low back pain with paravertebral irradiation. There was no sciatica, no new deficit in the neurological status of lower limbs neither bladder or bowel dysfunction. Unsuccessful medical and rehabilitation therapy. A lumbar spinal TC was made, and showed a calcification of the ligamentum flavum and calcification of the posterior joints capsule with foraminal and spinal stenosis. **Conclusion.** Calcification of the cervical, dorsal and lumbar ligamentum flavum is a progressive disease that starts early in life and becomes symptomatic later in life when spinal stenosis occurs. TC is the optimal diagnostic method, providing an adequate evaluation of the cord compression and an exact definition of the extent of the lesion. The treatment for calcification of the ligamentum flavum is the surgical decompression by laminectomy or laminoplasty. The prognosis in most cases is good. However, a rehabilitation program should be started gradually, as long as possible in the immediate postoperative.

References

1. Santiago FR, et al. Calcification of lumbar ligamentum flavum and facet joints capsule. Spine. 1997;22:1730-1735.
2. Li KK, et al: Myelopathy caused by ossification of ligamentum flavum. Spine 27:E308-E312, 2002.

Analysis and evaluation of anthropometric, biohumoral and energy expenditure parameters in a sample of patients admitted in our physical medicine and rehabilitation unit

D. Primon¹, L. Zanasca², M. Scapolo², S. Andretta², B. Ruzzante¹, P. Galligioni¹, L. Rocco¹, C. Scremin¹, A. Morbiato¹, A.M. Gonzalez¹.

¹Dipartimento di Medicina Fisica e Riabilitazione e Riabilitazione

²Servizio Dietetico, P.O. Cittadella-A.Ulss 15 "Alta Padovana"

Introduction. Early diagnosis and treatment of hospital malnutrition reduces complications and length of inpatients stay. The aim of the study is to monitoring the nutritional status of rehabilitation inpatients, for whom malnutrition is a risk factor for disability. **Material and methods.** 47 pts(61±18,9 years), 22 F and 25 M suffering from

stroke, paraplegia, traumatic brain injury, lower limb amputation, limb fracture and neuropathies, were monitored for 4 weeks; they underwent intensive rehabilitation and speech therapy. Dietician executed a nutritional plan in according to meet personal alimentary requirements. The evaluation protocol used included B.I. anthropometric data, physical composition, recording of Kcal/day. Data were elaborated using mean, median and standard deviation, Student's t test($\alpha=0,05$),line of linear regression. **Results.** After 4 weeks of follow up we found improvement of BI (from 26,8±22,2 to 44,4±29,4 $\alpha=0,05$) and of BMI (from 25,1±4,6 to 24,8±4,7 $\alpha=0,05$), both sexes weight loss (M g 900,F g 600), fat mass decrease (FM) in F($\alpha=0,05$), free fat mass preservation(FFM) and biochemical parameters within normal limits. We found a positive correlation between B.I. and BMI for both sexes and between B.I. and FFM in F. There is a negative correlation between B.I. and FM in overweight and normal weight M(>65year)and overweight F(<65year) and normal weight F(>65year). **Conclusion.** Adapting food intake to the need of patients allows a preservation of FFM, a decrease of FM, stability of nutritional biochemical parameters and disability improvement in patients suffering from acute disease. A teamwork is suggested for the assessment of nutritional risk, the definition of a dietetic plan and its effectiveness

References

1. A.M.Gonzalez. et al. Assesment nutrizionale in un campione di anziani non istituzionalizzati:rapporto con la disabilit .In Giornale di Gerontologia. Gen.1997,Vol.XLV.
2. Susanna Agostini et al. Ruolo del Dietista nella prevenzione e nel trattamento della malnutrizione per difetto nel paziente ospedalizzato e/o istituzionalizzato.Posizione Malnutrizione ANDID2009.

A Rehabilitation Department model for a territorial service network with an ad hoc public health budget management

P. Saccavino¹, C. Mariani², M. Sarcinella², M. Tavoni²

¹Director of Department of Rehabilitation ASLTO1 Torino

²Assistant Psychiatrists, Department of Rehabilitation ASLTO1.

The Local Public Health Unit TO1 in Turin has created a rehabilitation with its own budget to provide residential and semi-residential rehabilitation services. The reference population for the Local Public Health Unit amounts to approximately 500,000 people and 23% of these are over 65 years old. The assigned objective was to organise and manage rehabilitation services for patients with complex, severe disabilities and progressive chronic diseases, both in the acute phases and after their return home, within the limits imposed by the assigned economic budget. This goal was achieved by focusing on the following issues: 1.the selection of the resident population with severe disabilities, identifying their clinical, rehabilitation and social needs; 2.the management of tailored projects and the organisation of intensive or extensive programs sustainable within the economic budget with the available resources; 3. the involvement in the project of internist physicians and public health district managers in the scheme for taking patients into care, using computer support for communication; 4. the identification of efficacy indicators for patient care profiles; 5. the three-monthly assessment of total expenditure and forecasting to enable the public health unit to program the allocation of territorial resources; 6. the use of a "transmural" model to program agreements drawn up with accredited private outpatient rehabilitation services in the local area (15 centres) to create a territorial network and hospital-territory links, the concomitant management and monitoring by the Department of the annual budget for these services; 7. the organisation by the local public health unit of a network for the continuity of care for patients discharged after intensive or extensive hospital rehabilitation treatments. The above-described management model confirmed the feasibility of, and the need for a new, departmental type of working organisation, with direct responsibility for its budgeting, for the rehabilitation units forming part of the Local Public Health Units.

An innovative model for a multidisciplinary approach to lumbago diagnosis and rehabilitation treatment

P. Saccavino¹, C. Mariani², M. Tavoni², U. Mirarchi³, M. Arnoldo³, P. Gorgerino³, M.G. Lento³, A. Cerrano³

¹Director of Department of Rehabilitation, Local Public Health Unit TO1, Torino

²Assistant Psychiatrists, Department of Rehabilitation, Local Public Health Unit TO1

³Physiotherapists, Department of Rehabilitation, Local Public Health Unit TO1

The aim of this study was to describe a model for the assessment and treatment of *lumbago* based on a multidisciplinary approach and the combined use of treatment methods that are innovative for the public health system. The term “lumbago” indicates not a diagnosis, but a symptom that physiatrists have to use in order to identify the cause of the problem. The diagnostic hypothesis for the type of pain involved relies on interpreting the symptom with a view to establishing the diagnosis of a “movement dysfunction”, and enable the pathological integrated patterns to be analysed, assessing the patient’s muscle balance and *dynamic stability*. Recent neurophysiological and clinical studies have shown that movement dysfunctions are characterised by an impaired recruitment of low-threshold motor units and an inadequate control over the stabilisation of spinal functionality (Comerford & Mottram-2001, Bergmark et al.-1989). In recurrent or chronic lower back pain (LBP), there are changes in muscle morphology with an altered recruitment and “timing” of activation of the musculature. Some of these dysfunctions develop even before the onset of any symptoms and they are factors that contribute to the pain. The inefficient recruitment under low loading of the spine’s local and global *stabilizing* musculature is a predictor of recurrent back pain. During episodes of LBP, there are signs on EMG relating to the timing of activation of the patients’ multifidus and transversus abdominus muscles. The diagnosis of a dysfunction must analyse the two (*articular* and *myofascial*) components of the movement, identifying any *weaknesses* (uncontrolled movements) or *restrictions* (loss of movement). The proposed multidisciplinary intervention model is based on an early diagnosis of the anatomical structure sustaining the uncontrolled movement. The purpose of the recommended therapy is to re-educate the muscles that control the direction of the dysfunctional movement and the excessively short or dominant muscles that maintain the situation of *weakness* and *restriction*. It is important to ensure the patient’s active involvement in the diagnostic phase as well as in the design and implementation of the rehabilitation program; an analysis of the patient’s psychological habitat is also important. The value of the proposed model lies in the brevity of the treatment needed to reduce or eliminate the pain, the effective prevention of recurrences, and the beneficial effect on the user’s health education.

Prevention of pressure sores in a rehabilitation center

M. Enjalbert, N. Chaffaut, F. Galtier, T. Bouchema, R. Benyahya
Bouffard-Vercelli Center, Cerbère (France)

Introduction. Pressure sores were a frequent complication of the immobility which was a typical condition in a rehabilitation center, particularly in neurological ones. We described the experience in the prevention of pressure sores in the Bouffard-Vercelli Center which treated about 700 neurological patients by year and had choose this subject for the professional practices’ evaluation in the second procedure of certification. **Materials and methods.** In accordance with the consensus conference on pressure sores, we choose to organize their prevention with a procedure including a systematic evaluation of the risk by the Braden’s scale for all inpatient entrances and a prescription of a suitable support and others prevention’s measures like mobilization. This procedure was effective since 2006 and was evaluated annually by the retrospective review of 100 drawn lots patient’s files researching the rate of carrying out (%) for the Braden’s scale and for the right prevention’s measures, particularly in terms of support. Since 2008, this evaluation was conducted as part of national IPAQSS (indicators) experimentation on 100 rehabilitation centers. **Results.** The first evaluation, for 2006, give 30 % of carrying out for the Braden’s scale and fewer than 20 % for the prescription of the right prevention measures. The second evaluation, for 2007 give respectively 70 % and 50 %. The third evaluation, for 2008, as a part of national IPAQSS experimentation, give respectively 90 % et 75 %, classifying the Bouffard-Vercelli Center in A-class, the mean class (C) corresponding respectively with 50 % and 30 %. The fourth evaluation, for 2009 was current. **Conclusion.** The prevention of pressure sores included evaluation of the risk and prescription of a suitable support and others measures like mobilization. The procedure put in place showed good results in three years.

References

1. Consensus conference on pressure sores, HAS, Paris, 2001. 2. IPAQSS Experimentation, HAS, Paris, 2009.

Quality’s Indicators in PRM

M. Enjalbert, F. Rossband, J.M. Théry, C. Leblond, J.P. Crudo
Bouffard-Vercelli Center, Cerbère (France)

Introduction. The accreditation of health services was introduced in France by orders in 1996 and started in 1999 with the first book of standards (V1) edited by ANAES (national agency for accreditation and evaluation in health). The second one (V2) started in 2004, with HAS (high authority of health) and changed in 2007 (V2007) and 2010 (V2010) with introduction of quality’s indicators. **Materials and methods.** We reviewed the first procedure of accreditation (V1) for 15 PRM centers or hospitals with PRM unit, and the second one (V2 or V2007) for 15 others centers. V2010 is tackled with experimental evaluation (IPAQSS) of 5 indicators (patient’s file, outcome letter sending, pain evaluation, nutritional status and pressure sore prevention) in 100 PRM centers with comparative study of them. **Results.** V1 was no specific of rehabilitation facilities and give administrative view of hospitals. V2 and V2007 give a better practical view of them, with a specific chapter for rehabilitation facilities and another one for professional practices evaluation. IPAQSS gives a carrying out level (%) for each indicator. The median level gives C level and determines higher levels (A and B) and lower levels (D and E), comparatively between the different centers. This study permits a filing of them for each indicator. **Conclusion.** Quality’s indicators were management’s tools for health facilities. The accreditation introduced them in the practices of quality’s evaluation for the supervision of hospitals. The specificity of rehabilitation facilities was taken into account in some countries (USA for example, with CARF) but not in others. The PRM section worked on a specific accreditation. The French model is interesting for its indicators and its professional practices evaluation.

References

1. Standards Book of ANAES/HAS (V1 and V2), ANAES/HAS, Paris, 1999 and 2003. 2. IPAQSS Experimentation, HAS, Paris, 2009.

Effects of sulphate-sulphide mineral water “Mlječanica” on patients with hypertension

S. Marković, M. Stefanovski, T. Erceg

Institute for physical medicine, rehabilitation and balneoclimatology “Mlječanica”, K. Dubica, Republika Srpska

Introduction. Arterial hypertension is the main independent risk factor for cardiovascular diseases development and death. It affects development and course of stroke and chronic kidney insufficiency. Balneotherapy is preferred with patients with hypertension associated with obesity, diabetes, microangiopathies and atherosclerosis of peripheral arteries. **Goal:** To examine effects of sulphate-sulphide mineral baths on hypertension in stage I after 10-day therapy. **Materials and methods.** Patients with hypertension in stage 1 (Blood pressure - BP values 140-159/90-99mmHg) sent to Institute “Mlječanica” for rehabilitation of degenerative rheumatism. Patients with coronary disease, arrhythmia heart subdecompensated conditions and hyperthyroidism were excluded. All subjects were treated with kinesitherapy and electrotherapy, while experimental group (n=30) was also treated with sulphate-sulphide mineral baths (20 minute, 35°C), daily, for period of 10 days. BP level was monitored before and after treatment in mineral water. **Results.** In experimental group BP level decreased 10 mmHg after 10-days therapy (p<0,05), and change was evident after 5 days. In the control group there was no significant change of BP level. **Conclusion.** Sulphate-sulphide mineral water “Mlječanica” caused significant (p<0.05) lowering of arterial BP after 10 days of therapy in patients with stage 1 hypertension

References

1. Mancia G et al. 2007 ESH-ESC Guidelines for Management of Arterial Hypertension. *J Hypertens* 2007; 25:1105-87.
2. 2003 ESH-ESC Guidelines for Management of Arterial Hypertension; *J Hypertens* 2003; 21:1011-53.
3. Tišma RV, Stefanovski GO, Stefanovski MS. Prirodna ljekovita sumporna voda Instituta “Mlječanica”. Kozarska Dubica, 2005.

Effect of eccentric versus concentric exercise on skeletal muscle of rats: changes in mitochondrial function and emergence of oxydative stress

M.E. Isner-Horobeti^{1,2}, E. Lonsdorfer-Wolf², L. Rasseneur², S. Doutreleau², S. Dufour², F. Daussin³, Y. Burelle³, B. Geny², P. Vautravers¹, R. Richard²

¹Service de Médecine Physique et de Réadaptation, Hôpital de Haute-pierre, Strasbourg, France

²Service de Physiologie et des Explorations Fonctionnelles, Hôpital Civil, Strasbourg, France

³Département de Kinésiologie, Université de Montréal, Canada

Introduction. Muscles are approached differently depending on the type of muscle stimulation induced. Thus during concentric-uphill training (CON-UH), gastrocnemius (GAS), and soleus (SOL) are preferentially stimulated, while in eccentric-downhill training (ECC-DH), it is the vastus intermedius (VI) requested. Besides the development of force, eccentric training helps to develop other muscle features, through metabolic phenotypes and indirectly through mitochondrial respiration. However, little is known about the improvement in muscular oxydative capacities during eccentric. The aim of the study was to compare two types of muscle stimulation (CON-UH vs ECC-DH) in three types of muscle in rat (GAS, SOL and VI) and to analyse both the mitochondrial respiration and the reactive oxygen species (ROS) production. **Materials and methods.** Rats were randomly assigned to either CON-UH or ECC-DH training and were compared to control group (CTRL). Rats were trained for 5 consecutive days per week during 4weeks. At the end of the training periods, rats were sacrificed and muscle were removed: mitochondrial respiration (Vmax) on skinned muscle fibers, ROS production and Citrate Synthase activity (CS) were measured. **Results.** After CON-UH training, Vmax increased ($p < 0.01$) in GAS and SOL, (CTRL GAS: $3.97 \pm 1.04 \mu\text{molO}_2 \cdot \text{min}^{-1} \cdot \text{mg}^{-1} \text{ dw}$ vs CON-UH GAS: $5.39 \pm 0.98 \mu\text{molO}_2 \cdot \text{min}^{-1} \cdot \text{mg}^{-1} \text{ dw}$; CTRL SOL: $5.71 \pm 1.07 \mu\text{molO}_2 \cdot \text{min}^{-1} \cdot \text{mg}^{-1} \text{ dw}$ vs CON-UH SOL: $7.50 \pm 1.29 \mu\text{molO}_2 \cdot \text{min}^{-1} \cdot \text{mg}^{-1} \text{ dw}$), but not in VI. After ECC-DH training, in all three muscles, Vmax didn't increase compared to CTRL. ROS production didn't vary among GAS and SOL either after CON-DH nor ECC-UH-training, but increased in VI after ECC-DH training ($p < 0.01$) (ECC-DH VI: $217.47 \pm 113.12 \text{ pmol H}_2\text{O}_2 \cdot \text{min}^{-1} \cdot \text{mg}^{-1} \text{ ww}$ vs ECC-DH CTRL: $72.03 \pm 38.52 \text{ pmol H}_2\text{O}_2 \cdot \text{min}^{-1} \cdot \text{mg}^{-1} \text{ ww}$). Citrate synthase activity decreased ($p < 0.01$) in VI at the beginning of ECC-DH training (ECC-DH VI: $18.69 \pm 3.96 \text{ mU} \cdot \text{min}^{-1} \cdot \text{mg}^{-1}$ vs ECC-DH CTRL: $27.21 \pm 8.66 \text{ min}^{-1} \cdot \text{mg}^{-1}$). **Conclusion.** Eccentric training didn't improve muscular oxydative capacities probably due to ROS production associated to muscle damage.

Analysis of the measurement properties of brass index: a rasch analysis study

L. Panella¹, S. Caselli², F. La Porta², E. Fanton¹, S. Cuca Varsalona³

¹Rehabilitation Department, ASL Vercelli (Italy)

²Rehabilitation Unit, "Nuovo Ospedale Civile" di Modena (Italy)

³Nursing Home, "La Risaiia" di Marcignago (Italy)

Introduction. The Blaylock Risk Assessment Screening Score (BRASS) Index is a risk screening instrument which can be used to identify, shortly after hospital admission, those patients who are at risk for prolonged hospital stay and in need of discharge planning resources, in order to reduce or prevent post-discharge problems¹. The goal of this study was to test whether raw scores of BRASS index satisfied criteria for interval-level measurement using Rasch Analysis (RA). **Materials and methods.** Data were collected within an observational study (September 2005 - November 2009) conducted on a population of patients, admitted both to a department of Rehabilitation and to a nursing home. An 822 observations sample (463 patients) was analyzed. The following five requirements were checked within the context of RA: correct ordering of response categories, unidimensionality, local independence, invariance and absence of Differential Item Functioning (DIF). **Results.** RA showed that three items had to be rescored and three items had to be deleted (functional status, behavior pattern, mobility) in order to achieve a final seven-item solution. However, this showed low reliability (PSI 0.45) and the presence of DIF by gender, length of stay, discharge destination and patient's location (hospital vs. nursing home). **Conclusion.** The Brass Index does not satisfy criteria for interval-level measurement. Despite substantive changes to its original structure in terms of scoring and item content, further adjustments are needed for the presence of DIF. However, the clinical usability of this scale at the individual level would be hampered by its low reliability. The clinical implications of these results are discussed.

References

- Mistiaen P, Dijnhouwer E, Wijkkel D, deBont M, Veeger A. The problems of the elderly people at home one week after discharge from an acute setting. *J Adv Nurs* 1997; 25: 1223-40.
- Tesio L. Measuring behaviours and perceptions: Rasch analysis as a tool for rehabilitation research. *J Rehabil Med* 2003;35(3):105-15.

Home Based versus Hospital Based Cardiac Rehabilitation in patient with Coronary Disease: Prospective Study

S. Magalhães, H. Costa, M.M. Ribeiro, P. Fernandes, A. Barreira, S. Gonçalves

Santo Antonio General Hospital Oporto (Portugal)

Introduction. Cardiac Rehabilitation (CR) is an essential part of contemporary care of patients with heart dysfunction, and is considered a priority in countries with a high prevalence of Coronary Heart Disease (CHD). However, participation in these programs remains sub-optimal due to various problems attending CR Units. Home Based programs have been introduced to widen access and participation. **AIM:** To compare relative effectiveness of a Home-Based and Supervised Centre-Based CR program on modifiable cardiac risk factors and functional capacity in CHD patients. **Materials and methods.** Case-Control Prospective study including all patients referred to the CR Unit in 2008 and 2009 with a primary diagnosis of CHD. Some were assigned to a Home exercise training group (n=43) and others to a Hospital Based. From this latter cohort, patients within the same range for age, body weight, body mass and initial diagnosis patients were selected as controls to the Home-Based. All rehabilitation programs included exercise individual prescription, nutritional counseling and individual education about cardiovascular risk factor. Hospital Based program included supervised exercise sessions twice a week over 8 weeks. **Main outcome measures.** Smoking cessation, blood pressure, total cholesterol, LDL and HDL cholesterol, exercise capacity (measured in ml/Kg per minute on a symptom limited exercise test), habitual physical activity (self reported through questionnaire) were measured at baseline and after a 3 months period. **Results.** Both groups had similar socio-demographic and health profiles. "Home" patients had lower habitual physical activity scores and less significant improvement in exercise capacity compared to "Hospital" patients. Risk factor control improved significantly on both groups. **Conclusion.** Home-Based CR programs may be a potentially useful alternative to training in institutional environments, but they need to be taken into account social characteristics and individual patient needs to produce superior outcomes.

References

- Dalal HM, et al. Home based versus centre based cardiac rehabilitation: Cochrane systematic review and meta-analysis. *BMJ*.2010;340:b5631.

Physical therapy and rehabilitation of a patient with break of blade in post immobilization phase- case report

S. Popeskov, S. Jandrić, B. Milić, Krčum, D. Savičić, S. Vujaković, T. Nožica-Radulović, T. Bućma, D. Janković, S. Balaban

Institute for rehabilitation "Dr M.Zotović" Banja Luka, Republic of Srpska, BIH

Objective. Shoulder blades break occurs by direct action of force and the treatment is conservative-limb immobilization and rest. Consequences of immobility are weakened muscle strength of shoulder and upper arm, restriction of movement in the shoulder joint, which disturbs activities of daily living. Physical medicine and rehabilitation begins immediately after removal of immobilization and lasts until the full recovery of function of the upper extremity. **Case.** In this work is presented a 53 years old patient who acquired blow of blunt object in the left shoulder blade. X-ray recordings verified the fracture and the immobilization of limb was made and hold for a period of 1 month, under control of orthopedist. After removal of immobilization, started stationary treatment under the control of physiatrists. At first examination the patient complained about pain in his shoulder, clinical findings had shown limited and painful mobility in the left shoulder joint, impaired muscle strength and palpation pain of left shoulder. Parameters of subjective condition were followed, pain (measured by VAS scale) and clinical status: range of motion (measured by protractor), manual muscle test. Measurements were made at the beginning and end of treatment. Physical therapy and rehabilitation included: kinezotherapy, occupa-

tional therapy, hydrotherapy, electrotherapy and thermotherapy, it lasted 4 weeks and brought to increase range of motion in the shoulder, improvement of muscle strength in the shoulder and upper arm with reduced subjective pain. **Conclusion.** In conclusion we can say that at the end of the period of immobilization, adequate physical therapy led to significant improvements especially in the activities of independent living of this patient.

Custom lower limb orthoses, designed according to a new multidimensional approach, for facioscapulohumeral muscular dystrophy (fshd) patients

I. Aprile¹, C. Bordieri², A. Gilardi¹, M. Lanieri Milazzo², F. De Santis¹, R. Frusciantè³, E. Iannaccone³, E. Ricci^{1,3}, L. Padua^{1,3}

¹Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Pace, Rome, Italy

²Protesi Ortopediche Romane - P.O.R., Rome, Italy

³Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy

Introduction. Autosomal dominant facioscapulohumeral muscular dystrophy (FSHD), the third most common muscular dystrophy, is characterised by asymmetric and highly variable muscle weakness. In FSHD patients, the coupling of the ankle muscles impairment with the knee, hip and abdominal muscles impairment causes complex alterations of balance and deambulation with involvement their QoL [1]. Aims of this study are: 1) to evaluate the effects of different custom orthoses (foot orthosis-FO and ankle foot orthosis-AFO) specific for FSHD patients, on balance and deambulation, and 2) to propose a new multidimensional approach to design lower limb orthoses (useful for FSHD and other muscular dystrophies) according to clinical, functional and biomechanical assessments. **Materials and methods.** On 14 FSHD patients a clinical evaluation (MMT, Clinical Severity Score, 10 m-WT and 2 min-WT), an instrumented motor ability assessment (including baropodometry, stabilometry, and gait analysis), a disability (RMI, BBS) and patient-oriented (SF-36, NASS and Roland Questionnaire) assessment were performed. Patients were evaluated immediately after delivery and 1 month after delivery of the orthoses. **Results.** Preliminary data showed an improvement of walking performances (10-mWT p<0.01), balance (Romberg Index p<0.05) and QoL (PCS<0.01) when the patients wore the custom lower limb orthoses. **Conclusion.** The study shows that: 1) foot-orthoses and ankle-foot-orthoses customised for FSHD patients improve posture, balance and walking performance and 2) the design of the orthoses can be improved by means of a multidimensional clinical and biomechanical assessment.

References

Iosa M, Mazzà C, Frusciantè R, Zok M, Aprile I, Ricci E, Capozzo A. Mobility assessment of patients with facioscapulohumeral dystrophy. Clin Biomech 2007; 22:1074-82.

Walking and balance in facioscapulohumeral muscular dystrophy (FSHD): clinical and instrumental assessment

I. Aprile¹, A. Gilardi¹, C. Bordieri², M. Iosa³, R. Frusciantè⁴, E. Iannaccone⁴, E. Ricci^{1,4}, L. Padua^{1,4}

¹Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Pace, Rome, Italy

²Protesi Ortopediche Romane - P.O.R., Rome, Italy

³Fondazione Santa Lucia, Rome, Italy

⁴Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy

Introduction. Facioscapulohumeral muscular dystrophy (FSHD) is a dominantly inherited disorder characterised by an asymmetric and heterogeneous involvement of the facial, scapular and disto-proximal leg muscles. Interesting results have been obtained using a stereophotogrammetric system to quantitatively describe the walking capacity of FSDH patients, but this method is expensive and time-consuming [1]. In this study we propose a simple, economical instrumented approach – an electronic platform– to quantitatively measure plantar pressures (static analysis), gait (dynamic analysis), and balance (stabilometric analysis). **Materials and methods.** A total of 16 FSHD patients were included in this study and compared with 16 matched healthy subjects. In all patients the following protocol was performed: 1) clinical assessment (MMT and CSS); 2) walking performance (10m WT and 2min WT); 3) disability (RMI and BBS) and

patient-oriented assessment and 4) instrumental evaluation. **Results.** Static evaluation shows in FSHD, with respect to healthy subjects, that plantar pressure moves forward to the forefoot (p<0.05). Walking evaluation was found to be a reliable tool for simple quantitative gait analysis in FSHD patients showing a high correlation both with performance measures (10 m WT and 2 min WT, p<0.01) and with clinical severity measures (CSS, p<0.002). Finally, the stabilometric evaluation shows a greater instability of FSHD patients with respect to healthy subjects and shows a significant correlation with the 10 m WT, the CSS and the Berg Balance Scale (p<0.05), showing them to be sensitive tools of evaluation of balance. **Conclusion.** Our electronic platform seems to be a simple and economical instrumented approach to quantitatively measure plantar pressures in stance, walking performance and balance in FSHD patients.

References

Iosa M, Mazzà C, Frusciantè R, et al. Mobility assessment of patients with facioscapulohumeral dystrophy. Clin Biomech. 2007; 22: 1074-1082.

Low back pain in facioscapulohumeral muscular dystrophy

I. Aprile¹, S. Messina², G. Frasca³, R. Frusciantè⁴, E Iannaccone⁴, M. Iosa⁵, L. Padua^{1,4}, E. Ricci^{1,4}

¹Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Pace, Rome, Italy

²Università Cattolica del Sacro Cuore, Dipartimento Neuropsicologia Infantile, Rome, Italy

³Università Cattolica del Sacro Cuore, Dipartimento di Medicina fisica Riabilitativa, Rome, Italy

⁴Università Cattolica del Sacro Cuore, Dipartimento di Neurologia, Rome, Italy

⁵Fondazione Santa Lucia, Rome, Italy

Introduction. Facioscapulohumeral muscular dystrophy (FSHD) is a dominantly inherited disorder characterised by an asymmetric and heterogeneous involvement of the facial, scapular and disto-proximal leg muscles. Abdominal muscle weakness and hyperlordosis are often present. Recently a deterioration of Quality of Life (QoL) in FSHD patients we reported. [1]. In this prospective study we used a multidimensional protocol to evaluate the occurrence of LBP and its impact on the QoL in FSHD patients. **Materials and methods.** Fifty-five consecutive FSHD patients were enrolled To measure the clinical severity of the disease, a Clinical Severity Scale (CSS) was applied. The LBP assessment was performed by using three patient-oriented measures: a generic (SF-36), a distrectual (NASS) and disease-specific (Roland) questionnaire. Moreover in 10 patients, by using a stereophotogrammetric system, a walking task was performed. A system of axes rigid with the trunk and the pelvis was defined using several markers. The spine angles in the sagittal (tilt), frontal (obliquity) and coronal (rotation) planes were defined by the relative movement between these two coordinate systems. Finally a correlation of clinical, patient-oriented and biomechanical findings was performed. **Results.** Seventy-seven percentage of the patients complained LBP. Roland was highly related to clinical picture, physical and mental aspects of QoL domains. The lumbar column in FSHD patients showed a higher instability than healthy and this data is significantly correlated to Roland. **Conclusion.** Our study shows that LBP is common in FSHD patients and it influences their QoL. Moreover a relationship we observe between LBP anterior-posterior instability of the lumbar column in FSHD patients. A specific postural treatment could be included in the rehabilitation program of FSHD patients to reduce or treated LBP.

References

Padua L, Aprile I, Frusciantè R, et al. Quality of life and pain in patients with facioscapulohumeral muscular dystrophy. Muscle Nerve. 2009 Aug;40(2):200-5.

Plasticity of organization outpatient. Experience in the region of lazio rehabilitation center of s. Maria della pace roma – fondazione don carlo gnocchi onlus

N.A. Arena¹, A.E. Ruggeri¹, L. Padua^{1,2}, V. Gazzetti¹

¹Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Pace, Rome, Italy

²Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy

Introduction. Non-residential rehabilitative intervention is characterized by the need to interpret the functional changes but also

the limitations of autonomy and consequent dependence in daily living activities and working relationships. For this reason the rehabilitative intervention on the person always tended to intervene at various levels, as indicated by ICF: etiology, impairment, disability and handicap. The "round care" of the individual is able to address the various issues that have an impact. That particular type of disability, through the efforts of a group of coordinated professionals prepare a draft individual rehabilitation. **Materials and methods.** The task assigned to our structure in the Lazio Region is to treat patients with complex disabilities. For that reason at taking charge of the piece is evaluated through a comprehensive framework of disability using the ICF. The subject is assessed by using validated scales for the specific disability. At the end of the path of rehabilitation, the patient is again evaluated with the same measurement system, administered at the entrance. **Results.** Our organizational model allows us to monitor through the measuring instruments clinical activity, the outcomes of rehabilitation projects and the achievement of objectives over time optimizing the appropriateness of rehabilitation. **Conclusion.** Over the years there has been a continual evolution and diversification of sources of disability conditions that have come under our observation for both directions by changing both our institutional capacity to differentiate the offer rehabilitative and this has imposed to maintain an adequate standard knowledge and scientific update and above all to structure new and more integrated operating routes to achieve the goals of the individual rehabilitation projects.

References

Ewert T, Allen DD, Wilson M, Ustün B, Stucki G. Validation of the International Classification of Functioning Disability and Health framework using multidimensional item response modeling. *Disabil Rehabil.* 2010. In press.

Treatment for ulnar neuropathy at the elbow. A systematic review

P. Caliandro^{1,2}, G. La Torre³, R. Padua^{2,4}, F. Giannini⁵, L. Padua^{1,2}

¹Fondazione Don Carlo Gnocchi Onlus, Italy

²Istituto di Neurologia, Università Cattolica del Sacro Cuore, Rome, Italy

³Dipartimenti di Medicina Sperimentale, Università "La Sapienza" di Roma, Rome, Italy

⁴Ospedale S. Giacomo, Dipartimento di Ortopedia, Rome, Italy

⁵Università di Siena, Dipartimento di Neuroscienze, Siena, Italy

Introduction. The treatment of UNE may be conservative or surgical. Despite different opportunities in treating UNE, optimal management remains controversial. The objective of this systematic review is to determine whether surgical and conservative treatments are effective in reducing symptoms and increasing nerve function.

Materials and methods. The review will include controlled clinical trials using truly random or quasi-random allocation of treatment. We will search the Cochrane Neuromuscular Disease Group Trials Register MEDLINE, EMBASE, CINAHL, AMED, LILACS and PEDro. **Results.** We found four RCTs¹⁻⁴ and three of them were included in a meta-analysis to evaluate the clinical evolution. In the three studies simple decompression was compared with transposition (submuscular or subcutaneous) of ulnar nerve. We also performed a meta-analysis of the neurophysiological outcome including two papers. We found no significant difference in post-operative clinical scores and motor nerve conduction velocity between simple decompression and transposition (subcutaneous or submuscular) of ulnar nerve. **Conclusion.** No evidence is available on the effectiveness of conservative treatment in reducing symptoms and increasing nerve function. Simple decompression and decompression with transposition have the same efficacy.

References

1. Bartels et al. Prospective randomized controlled study comparing simple decompression versus anterior subcutaneous transposition for idiopathic neuropathy of the ulnar nerve at the elbow. *Neurosurgery* 2005 Mar;56(3):522-30.
2. Biggs, Curtis. Randomized, prospective study comparing ulnar neurolysis in situ with submuscular transposition. *Neurosurgery* 2006 Feb;58(2):296-304.
3. Gervasio et al. Simple decompression versus anterior submuscular transposition of the ulnar nerve in severe cubital tunnel syndrome: a prospective randomized study. *Neurosurgery* 2005;56(1):108-17.
4. Nabhan et al. Simple decompression or subcutaneous anterior transposition of the ulnar nerve for cubital tunnel syndrome. *J Hand Surg Br* 2005 Oct;30(5):521-4.

Correctal control of gait in patients with ataxia

P. Caliandro^{1,2}, G. Silvestri², I. Minciotti¹, G. Russo¹, P.A. Tonali^{1,2} L. Padua^{1,2}

¹Fondazione Don Carlo Gnocchi Onlus, Italy

²Istituto di Neurologia, Università Cattolica del Sacro Cuore, Rome, Italy

Introduction. Experimental studies indicate that neurons in the medial portion of the primary motor cortex are actively involved in walking. The recently developed near-infrared spectroscopic (NIRS) imaging technique allows visualization of cortical activities during dynamic movements. There is evidence that the prefrontal and premotor cortex might be involved in controlling locomotion to adapt to the increasing speed in the acceleration phases (Suzuki, 2004). No evidence is available on the prefrontal cortex function in controlling gait in patients with ataxia. **Materials and methods.** We have evaluated 20 patients with gait ataxia. The prefrontal activation during walking was evaluated by NIRS. The system can detect changes in oxygenated hemoglobin (oxyHb), deoxygenated hemoglobin (deoxyHb), and total hemoglobin (totalHb) variation in the cerebral cortex. We also studied 10 normal subjects. **Results.** Gait ataxia was bilaterally associated with changes in hemoglobin oxygenation in prefrontal cortical regions. The levels of oxyHb and totalHb started to increase 3 to 5 s after the task onset, reached a plateau at 5 to 10 s, and returned to the baseline 3 to 5 s after the end of the task. The median variation of oxyHb, deoxyHb, and totalHb during gait were respectively 2.4, -0.2, 2.2 in the right lobe and 2.3, -0.6, 2.1 in the left one. No activation of prefrontal cortex was found in normal subjects. **Conclusion.** Furthermore this imaging technique may also be applied to the evaluation of cortical activation patterns during pathological gait, such as that seen in stroke and Parkinson's disease, and may enable us to study how these patterns are modified during and after rehabilitative intervention.

References

Mitsuo Suzuki, Ichiro Miyai, Takeshi Ono, Ichiro Oda, Ikuo Konishi, Takanori Kochiyama, and Kisou Kubota. Prefrontal and premotor cortices are involved in adapting walking and running speed on the treadmill: an optical imaging study. *NeuroImage* 23 (2004) 1020-1026.

Pain in Ehlers-danlos syndrome

F. Camerota¹, C. Celletti¹, M. Castori², C. Pazzaglia^{3,4}, L. Padua^{3,4}

¹Physical Medicine and Rehabilitation Division, "La Sapienza" University, Umberto I Hospital, Rome, Italy.

²Medical Genetics, Experimental Medicine Department, "Sapienza" University, San Camillo-Forlanini

³Institute of Neurology, Università Cattolica del Sacro Cuore, Pol. A. Gemelli, Rome, Italy

⁴Don Carlo Gnocchi Onlus Foundation, Italy

Introduction. Ehlers-Danlos syndrome (EDS) is a heterogeneous group of hereditary connective tissue disorders, whose main features are skin hyperextensibility, joint hypermobility and tissue fragility. Pain is a common problem in EDS but the features and nature of the pain are not yet been investigated. **Materials and methods.** 38 EDS patients (26 with the hypermobile and 12 with the classic forms) were evaluated using a discriminative pain tool (ID Pain) to evaluate the origin of pain (nociceptive vs neuropathic), the Italian version of the Neuropathic Pain Symptom Inventory (NPSI) scale to assess the severity of neuropathic pain, and the Numeric Rating Scale (NRS) to generally assess pain severity. **Results.** Mean NRS was 6.7/10 (SD 1.8) and 93% patients complained of at least moderate pain ($\geq 3/10$). According to the ID Pain, 42% patients likely suffered from neuropathic pain. Dividing patients into the 2 clinical variants (i.e., classic and hypermobile) did not show any statistical difference. Females complained of more severe pain than males in most pain domain from NPSI, as often observed in pain assessment. Statistical correlation between age and pain measures showed that older patients complained of more severe pressing/deep pain (NPSI domain) than younger and that the former complained of higher occurrence of pain during a day (frequency weighted NPSI domain). **Conclusion.** The current results showed that pain is a crucial symptom in EDS. Nociceptive pain would be expected because of the primary joint involvement. Unexpectedly, the study showed that pain has major neuropathic features. A correct therapeutic and rehabilitative approach may improve quality of life of these patients. Further studies are needed to better understand the origin of neuropathic pain.

References

Beighton P et al. Ehlers-Danlos syndromes: revised nosology, Villefranche, 1997. 1998. *Am J Med Genet* 77:31-37.
 Castori M., Camerota F, Celletti C., Grammatico P, Padua L. Quality of Life in the Classic and Hypermobility types of Ehlers-Danlos Syndrome *Ann Neurology* (in press)
 Bouhassira D. et al Development and validation of the Neuropathic Pain Symptom Inventory. *Pain* 2004; (108) 248-257
 Castori M, Camerota F, Celletti C., Danese C., Santilli V., Saraceni V.M., Grammatico P. Natural History and Manifestations of the Hypermobility Type Ehlers-Danlos Syndrome: A Pilot Study on 21 Patients. *American Journal Medical Genetics A* 2010 Feb5
 Padua L. et al Validation of the Italian version of the Neuropathic Pain Symptom Inventory in peripheral nervous system disease. *Neurol Sci.* 2009 (30) 99-106

Focal muscle vibration in the treatment of upper limb spasticity: a pilot randomized controlled trial in chronic stroke patients

F. Camerota¹, P. Caliendo^{2,3}, C. Celletti¹, G. Granata^{2,3}, G. Russo³, G. Galeoto¹, I. Minciotti³, I. Campa¹, L. Padua^{2,3}

¹Physical Medicine and Rehabilitation Division, "Sapienza" University, Umberto I Hospital, Rome, Italy.

²Institute of Neurology, Università Cattolica del Sacro Cuore, Rome, Italy

³Fondazione Don Carlo Gnocchi Onlus, Rome, Italy

Introduction. Some evidence demonstrates that the muscle vibration technique activates proprioceptors and reduce spasticity. In this study we investigated the effects of repeated muscle vibration (rMV) on the upper limb spasticity in patients with chronic hemiplegia (more than one year). **Materials and methods.** We randomized in two groups 49 consecutive patients (33 males, 16 females, mean age 58,43±14,37): the treated group (TG) and the control group (CG). The TG (28 patients mean age 56,88± 13,26) underwent to a low-amplitude focal rMV at a fixed frequency of 100 Hz applied over the pectoral minor, the biceps and carpal flexor muscles. The patients were treated for 3 consecutive days, 3 times a day, with each application lasting for 10 min for each site. The CG (21 patients mean age 60,47±15,86) received a sham vibratory stimulation. All the patients were evaluated before treatment (T0) after one week (T1) and after one month (T2) with the Wolf Motor Function Test (WMFT). WMFT score were analyzed using the Wilcoxon signed rank tests. **Results.** The total score of WMFT improves one month after treatment in the TG (p: 0.01). No change was observed between T0 and T1 in the SG. No significant differences were founded in the CG. **Conclusion.** The results showed that rMV technique may be a reasonable option for the improvement in the upper limb function and may help the rehabilitation program for the chronic stroke patients.

References

1. Marconi B et al. Long-term effects on motor cortical excitability induced by repeated muscle vibration during contraction in healthy subjects. *J Neurol Sci.* 2008; 275: 51-9
 2. Michael W et al. Stroke Rehabilitation: Strategies to Enhance Motor Recovery. *Annual Review of Medicine* 2009 Vol. 60: 55-68

Quality of life in ehlers-danlos syndrome

C. Celletti¹, F. Camerota¹, M. Castori², L. Padua^{3,4}

¹Physical Medicine and Rehabilitation Division, "La Sapienza" University, Umberto I Hospital, Rome, Italy.

²Medical Genetics, Experimental Medicine Department, "Sapienza" University, San Camillo-Forlanini Hospital, Rome, Italy.

³Institute of Neurology, Università Cattolica del Sacro Cuore, Pol. A. Gemelli, Rome, Italy

⁴Don Carlo Gnocchi Onlus Foundation, Italy

Introduction. Ehlers-Danlos syndrome is a heterogeneous group of a hereditary connective tissue disorders. Among the 6 major types, the hypermobility and the classic types are the most common. The characteristics features of this syndrome are skin hyperextensibility, joint hypermobility, cutaneous fragility. Pain, fatigue and other problems are frequently referred from these patients but no previously studies about quality of life have been investigated. **Materials and methods.** The Italian version of SF36 was assessed to 21 EDS patients. We compared the SF36 results of the EDS sample with Italian norms. **Results.** We observed marked deterioration of QoL in EDS patients in most SF36 domains with respect to the Italian norms. We also divided our cohort into 2 subgroups (hypermobility type

n.12, classic type n.9) according to the clinical form and did not find any difference in QoL pattern. **Conclusion.** We found all SF-36 items altered in EDS patients, excepted role emotional and mental health compared to Italian normal population. They have a lower participation in physical and social life referred to important pain and fatigue; we think that the normality of mental pattern are probably due to the inclusions of these patients in a personalized follow-up program that probably positive influence the emotional pattern.

References

Beighton P et al. Ehlers-Danlos syndromes: revised nosology, Villefranche, 1997. 1998. *Am J Med Genet* 77:31-37.
 Castori M, Camerota F, Celletti C, Grammatico P, Padua L. Quality of Life in the Classic and Hypermobility types of Ehlers-Danlos Syndrome *Ann Neurology* (in press)
 Apolone G, Mosconi P. Questionario sullo stato di salute SF-36. Milan (Italy): Guerini e Associati, 1997.
 Castori M, Camerota F, Celletti C., Danese C., Santilli V., Saraceni V.M., Grammatico P. Natural History and Manifestations of the Hypermobility Type Ehlers-Danlos Syndrome: A Pilot Study on 21 Patients. *American Journal Medical Genetics* (in press)

Group rehabilitation versus individual rehabilitation following knee and hip arthroprothesis

F. De Santis¹, I. Aprile¹, A. Gilardi¹, G. Robustelli¹, R.S. Rizzo¹, L. Padua^{1,2}

¹Fondazione Don Carlo Gnocchi Onlus, Centro Santa Maria della Pace, Rome, Italy

²Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy

Introduction. In recent years a prosperous literature concerning cost effectiveness studies was produced. The aim of these studies is to evaluate the cost-benefit ratio of a particular intervention or treatments, and to compare standard intervention with alternative ones in order to determinate if alternative is more cost effective [1]. The group rehabilitation programs, in some pathological conditions, could permit a better allotment of the economical resources but few studies are reported on the efficacy of group physiotherapy with respect to individual physiotherapy [2]. The purpose of this study is to compare the effects of group rehabilitation (GR) with respect individual rehabilitation (IR) in patients undergo knee and hip arthroprothesis. **Materials and methods.** This is a single-blind, randomized controlled trial. On 24 patients, clinical -disability evaluation (JOASH, IKS, DI) and patient-oriented assessment (SF-36, WOMAC and VAS) were performed. Patients who were able to weight-bear postoperatively were included and then randomized (T0) in two intervention program: group GR/IR -who performed GR for 15 days (T1), followed by the IR for 15 days (T2); and group IR/GR - who performed the IR for 15 days (T1), followed by GR for 15 days (T2). **Results.** Comparing the changes from baseline T1-T0 and T2-T1 separately in the two groups no significant differences were observed in all outcome measures. **Conclusion.** This trial suggests that the group rehabilitation program is likewise efficient as the individual rehabilitation in patients undergo knee and hip arthroprothesis able to weight-bear postoperatively.

References

1. Cardenas DD, Haselkorn JK, McElligott JM, Gnatz SM. A bibliography of cost-effectiveness practices in physical medicine and rehabilitation: AAAPM&R White Paper, *Arch Phy Med Rehabil* 2001;82:711-9.
 2. Kaapa EH, Frantsi K, Sarna S, Malmivaara A. Multidisciplinary Group Rehabilitation Versus Individual Physiotherapy for Chronic Nonspecific Low Back Pain A Randomized Trial. *SPINE* 2006;31(4):371-376.

How ultrasound can assist neurophysiology to diagnose ulnar neuropathy at elbow

A. Di Pasquale^{1,3}, P. Caliendo^{2,3}, G. Granata^{2,3}, C. Pazzaglia^{2,3}, L. Hobson-Webb⁴, C. Martinoli⁵, L. Padua^{2,3}

¹Neurology S. Andrea Hospital, Sapienza University, Rome, Italy

²Dipartimento di Neuroscienze, Università Cattolica del Sacro Cuore, Rome, Italy

³Fondazione Don Carlo Gnocchi Onlus, Italy

⁴Department of Medicine, Division of Neurology, Duke University, Durham, USA.

⁵Cattedra di Radiologia "R", DICMI. Università di Genova, Genova, Italy

Introduction. Recently, ultrasound (US) has proven to be helpful in detecting nerve entrapment syndromes. The aim of the study is to evaluate role of US in increasing diagnostic sensitivity, US parame-

ters and relationships with neurophysiological findings in Ulnar Neuropathy at Elbow (UNE). **Materials and methods.** As complement of clinical-neurophysiological assessment we performed nerve US on 33 patients with clinical suspected UNE. **Results.** Pathological neurophysiological findings were detected in 79%. Pathological US findings were found in 91% considering cross sectional area (CSA), and in 88% considering anterior-posterior diameter. The combined use of both tools increased the detection of abnormal findings to 97%. A correlation between CSA and neurophysiological severity were observed. **Conclusion.** We confirmed that US is a useful complement to neurophysiology in diagnosing UNE and that there is a correlation between nerve morphology and neurophysiological findings. Moreover, CSA at the point of maximal engagement seems more sensitive than anterior-posterior diameter

References

- Beekman R, Van Der Plas JP, Uitdehaag BM, Schellens RL, Visser LH. Clinical, electrodiagnostic, and sonographic studies in ulnar neuropathy at the elbow. *Muscle Nerve*. 2004 Aug;30(2):202-8
- Bhala RP. Electrodiagnosis of ulnar nerve lesions at the elbow. *Arch Phys Med Rehabil*. 1976 May;57(5):206-12
- Tackmann W, Vogel P, Kaeser HE, Ettlin T. Sensitivity and localizing significance of motor and sensory electroneurographic parameters in the diagnosis of ulnar nerve lesions at the elbow. A reappraisal. *J Neurol*. 1984;231(4):204-11.

A protocol of early loading utilizing a body suspension system (body weight support) in post-stroke gait recovery: case control study

A. Gilardi¹, I. Aprile¹, F. Camerota², L. Padua^{1,3}, L. Cortellini¹

¹Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Pace, Rome, Italy

²Physical Medicine and Rehabilitation Division, "Sapienza" University, Umberto I Hospital, Rome, Italy

³Università Cattolica del Sacro Cuore, Dipartimento di Neurologia, Rome, Italy

Introduction. The recovery of gait in post-stroke patients is related to the static and dynamic balance and leads to a better quality of life too. Our proposal is to use a progressive loading system (using a system of BWS) during a neuromotor re-education program. **Materials and methods.** We have recruited 16 post-stroke patients during post-acute hospitalized rehabilitation. Each patient was recruited within 6 weeks after acute and was randomized into one of two groups: A) early loading with reduced body weight + conventional treatment (30 '+30' daily for 4 weeks) and B) conventional treatment (60 'a day for 4 weeks). At the beginning (T0) and at the end of trial after 4 weeks (T1), patients in group A and B were submitted to the following protocol: 1) disability assessment with Barthel Index (BI), Hauser and Deambulation Index (DI); 2) Walking and balance assessment through the Berg Balance Test (BBT) and Gait Assessment Rating Scale (GARS) 3) muscle tone evaluation with the Ashworth scale and muscle strength with the Motricity Index. To assess the sample homogeneity and representativeness, the two groups were compared with a broad group of post-stroke patients hospitalized in our Centre (N = 63). **Results.** We used Mann-Whitney test for comparisons between groups and the Wilcoxon paired-sample test for the analysis of differences between T0 and T1. Significant differences were found on disability scales (BI, DI: P <0.05) balance (BBT: P <0.05) and gait (GARS: P <0.05). **Conclusion.** Early loading in post-stroke rehabilitation using a BWS system does not cause the appearance of elementary and pathological patterns of movement, but rather increases the recovery of autonomy related with deambulation and balance.

References

- Aprile I, Romitelli F, Padua L, Lancellotti S, Gilardi A, Di Stasio E. Effects of rehabilitation on quality of life in patients with chronic stroke. *Brain Inj*. 2008 Jun; 22(6):451-6.

Risk factors and incidence of spinal pain in an urban school children sample

A. Gilardi¹, I. Aprile¹, F. De Santis¹, M.T. Vincenzi¹, L. Padua^{1,2}, F. Savi Scarponi¹

¹Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Pace, Rome, Italy

²Università Cattolica del Sacro Cuore, Dipartimento di Neurologia, Rome, Italy

Introduction. Our goals were to evaluate: the appropriateness of the couple sitting in the desk-chair also with respect to the chair or the board, the breaks times by activism and possible teaching physical activity, the weight of the backpack and mode and time of transport, frequency of pain in school and compared to other activities. **Materials and methods.** Sample of 287 school-age children. Using questionnaires and direct assessments were recorded: anthropometric and data related to ergonomics as the weight of the backpack, the measures of the school desk and chair, the adequacy of the sitting posture, and the position related to the teacher, habits transport backpack, time spent to arrive to school; presence and frequency of pain at school and in extracurricular activities. **Results.** Transport of backpack is correlated with age (P <0.0001), height and weight of the child (P <0.05), no sex and distance to school. The weight of the backpack does not vary between the primary and secondary school (P > 0.05) but remains statistically above the limit of 15% required by legislation (P <0.05). The frequency of perceived pain generally increases with age and among males, but is higher in school activities (respectively P = 0.002 for age and sex P <0.00005) than in those extracurricular (respectively P = 0.04 and P = 0.002). Finally, the frequency of pain increases to school in the sample does not perform physical activity during breaks provided (P <0.005). **Conclusion.** The presence of the DV in our sample is present and appears more related to the position in class and lack of physical activity during breaks in the program that the transport of the backpack at school.

References

- Negrini S, Carabalona R. Backpacks on Schoolchildren's Perceptions of Load, Associations with Back Pain and Factors Determining the Load. *Spine* 2002; 27 (2): 187-95.

Posture and laterality: weight bearing in quiet standing. Cross-sectional study

A. Gilardi¹, L. Padua^{1,2}, I. Aprile¹

¹Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Pace, Rome, Italy

²Università Cattolica del Sacro Cuore, Dipartimento di Neurologia, Rome, Italy

Introduction. It's recognized that the repeated and prolonged loading produces increased bone mineral density and morphology of femur structures. These asymmetries are more obvious on the left side. Many authors have linked these differences with the lateralization of manipulative and complementary limbs activities. Our goal was to evaluate the asymmetry in the distribution of the load (weight bearing) in quiet standing, correlating it, if confirmed, with lateralization (hand, leg, eye), different tasks, and support base variation. **Materials and methods.** 42 healthy subjects (mean 27.9 AA, SD±8.7, 12 _ / 30 _) have completed 8 tests continuous of 5" anyone, using a baropodometric platform, under 4 different conditions: with visual manipulation, cognitive-perceptual and anticipatory postural tasks, standardized and comfortable foot position. To all participants were administered a battery of short and structured tests to investigate the lateralization of limbs, leg and eye. **Results.** Our sample of right-handed subjects (79.5%) and left-handers (11.3%) is similar to the general distribution reported in the literature (P > 0.9). All the same for dominance of leg and eye. Weight bearing distribution calculated as index of symmetry (IS) shows a significance for the left side (P <0.0001) in standardized foot position, compared to the comfort foot position (NS), particularly in females (P <0.0001). Males seem to use more visual-vestibular information than females to maintain *Symmetric load* distribution between foot. They are less affected by cognitive tasks such as anticipatory postural task (NS) **Conclusion.** Our data confirms that when postural system is involved, quiet standing is lateralized and neuronal specialized networks may justify the "task-related" shift of load. Postural responses in different tasks are also different between males and females, needing of future investigations. This could also justify anatomical and structural asymmetries in the femur structures.

References

- Venkata G. Weight-Bearing Asymmetry in Quiet Standing. *Arch Phys Med Rehabil* Vol 89, October 2008.

Levodopa effect on electromyographic activation patterns of tibialis anterior muscle during walking in parkinson's disease

G. Granata^{1,2}, P. Caliendo^{1,2}, M. Ferrarin³, M. Cioni⁴, A. Bentivoglio¹, I. Minciotti^{1,2}, P. Tonali^{1,2}, P.I. D'Urso⁴, L. Padua^{1,2}

¹Institute of Neurology, Università Cattolica del Sacro Cuore, Rome, Italy

²Fondazione Don Carlo Gnocchi Onlus, Italy

³Polo Tecnologico, Fondazione Don Carlo Gnocchi Onlus IRCCS, Milan, Italy

⁴Laboratory of Gait and Motion Analysis, School of Medicine, University of Catania, Catania, Italy

⁵Department of Neurosciences – Section of Neurosurgery. University of Bari Medical School, Bari, Italy

Introduction. Previous studies reported that patients with Parkinson's disease (PD) show, in "off" state, a reduced activation of Tibialis Anterior (TA) in the late swing-early stance phase of the gait cycle [1]. These findings were obtained by calculating the mean values of a number of stride cycles for each patient and assuming that gait is a cyclic phenomenon. In PD patients however, the pathophysiological picture may cause differences among the stride cycles. Our aims were: 1) to evaluate how frequent is the reduction of TA activity in the late swing-early stance phase among different gait cycles and 2) to evaluate if Levodopa is able to modify the TA activation patterns. **Materials and methods.** We evaluated 30 PD patients during two settings: 1) two hours after Levodopa administration ("on-med"), 2) 12 hours after Levodopa wash-out ("off-med"). Patients were evaluated by the UPDRS III and surface electromyography of TA and Gastrocnemius Medialis (GM). **Results.** A reduced TA activity during the late swing-early stance phase was found in 30% of patients and only in the "off-med" condition. Among these patients, the percent of stride cycles with reduced TA activity ranged between 28% and 83%. After Levodopa intake no stride cycle showed reduction of TA activity. The patients with reduced TA activity in the "off-med" condition, had a lower UPDRS III total score in the "on-med" condition rather than in the "off-med" condition (p: 0.02). **Conclusion.** Our data suggest that, in PD patients TA function during gait is not always impaired. When involved, TA activation is reduced in a relatively high percent of gait cycles only in the "off-med" condition.

References

Cioni M, Richards CL, Malouin F, Bedard PJ, Lemieux R. Characteristics of the electromyographic patterns of lower limb muscles during gait in patients with Parkinson's disease when OFF and ON L-Dopa treatment. *Ital J Neuro Sci* 1997; 18: 195-208.

Contribution of ultrasound in traumatic nerve lesions

G.A. Liotta^{1,2}, A. Di Pasquale^{1,3}, C. Pazzaglia^{1,4}, G. Granata^{1,4}, P. Caliendo^{1,4}, P. De Franco^{1,4}, P. Girlanda², L. Padua^{1,4}

¹Fondazione Don Carlo Gnocchi Onlus, Italy

²Dipartimento di Neuroscienze, Scienze Psichiatriche ed Anestesiologiche, Università di Messina, Messina, Italy

³Dipartimento di Neuroscienze, Università degli Studi "La Sapienza", Rome, Italy

⁴Dipartimento di Neuroscienze, Università Cattolica, Rome, Italy

Introduction. Traumatic nerve lesions are not commonly observed in a neurophysiological lab but orthopedic surgeons, neurosurgeons and rehabilitation physicians expect from neurophysiologists crucial answers to decide therapeutically approach. Most of the answers cannot be provided through electromyography (EMG) only. Often nerve conduction studies and EMG can successfully localize the site of lesion, but, specially in the early stage after trauma, it is difficult to define the underlying pathophysiological involvement (axonotmesis, neurotmesis, neuropraxia), and to give prognostic and therapeutic information. Recently, Ultrasound (US) is gaining more attention on its diagnostic role in nerve involvement. The aim of this study was to assess the type of contribution of US in the evaluation of traumatic nerve lesions and how US completes and enhances the EMG evaluation. **Materials and methods.** In 43 patients with traumatic nerve lesions we performed clinical, neurophysiological and ultrasound evaluation in the same session. As for US diagnosis we used quantifiable measurements such as a cross sectional area (CSA) and longitudinal diameter. Hypo and hyperecogenity were also evaluated, but abnormality of echogenity alone was not considered as abnormal finding. **Results.** US confirmed the diagnosis previously reached or strongly suspected through clinical and neurophysiological

assessment in 30,2% of patients, US strongly modified diagnosis and therapy in 53,5% of patients, US did not modified the diagnostic path in 16,3% of patients. **Conclusion.** Our study showed that US has a crucial role in traumatic nerve lesion assessment. In fact US is able to show nerve continuity or interruption and the relationship between nerve and surrounding structures; in some cases US detects unexpected nerve impairment (far from the region of trauma) and it allows us to understand how the lesion came out. In conclusion, in a traumatic nerve lesion US completes the electrophysiological data providing crucial information otherwise not obtainable, offering immediately after trauma, precise information useful for therapy and prognosis.

References

Chan M, Pesquer L, Vandermarcq P. Contribution of neuroradiology to the evaluation of peripheral nerves. *Neurochirurgie*. 2009 Oct;55(4-5):442-53

Circulating CD8+perforin+lymphocytes correlate with physical disability in patients affected by multiple sclerosis

V. Nociti^{1,2}, G. Frisullo², R. Iorio², D. Plantone², A.K. Patanella^{1,2}, P. Tonali^{1,2}, L. Padua^{1,2}, A.P. Batocchi²

¹Don Carlo Gnocchi Onlus Foundation, Italy

²Catholic University, Institute of Neurology, Rome, Italy

Introduction. CD8+ lymphocytes are the most frequent T cell subset in acute e chronic Multiple Sclerosis (MS) lesions and their number correlates with axonal damage [1]. Perforin is a component of the lytic granules in cytotoxic CD8+ T cells and plays a critical role in cell-mediated cytotoxicity. The objective of this study is to evaluate the percentage of CD8+Perforin+lymphocytes in peripheral blood mononuclear cells (PBMC) from MS patients in different phase and course of the disease and to correlate CD8+Perforin+lymphocytes with physical disability. **Materials and methods.** We included in the study 44 relapsing-remitting (RR) (18 relapsing and 26 remitting), 12 secondary progressive (SP), 8 primary-progressive (PP) MS patients and 27 healthy controls. For the detection of Perforin expression in peripheral blood CD8+ lymphocytes, PBMC were analyzed by flow cytometry. Physical disability was scored using the Expanded Disability Status Scale [2]. **Results.** The percentages of CD8+Perforin+lymphocytes were increased in PBMC of MS patients as compared to controls. The percentages of CD8+Perforin+lymphocytes were increased in relapsing RRMS patients. Remitting RRMS patients showed increased expression of Perforin in CD8+lymphocytes than controls. SPMS and PPMS patients showed higher percentage of circulating CD8+Perforin+ lymphocytes than controls. The percentage of circulating CD8+Perforin+lymphocytes positively correlated with the age and the disability score in the three groups in MS patients. **Conclusion.** The percentage of circulating CD8+Perforin+lymphocytes correlate with physical disability and age, thus Perforin can be considered a marker of confirmed disability and may account for age-related disability in MS patients.

References

McDole J, Johnson AJ, Pirko I. The role of CD8+ T-cells in lesion formation and axonal dysfunction in multiple sclerosis. *Neurol Res*. 2006;28(3):256-61.
J.F. Kurtzke, Rating neurological impairment in multiple sclerosis: an expanded disability status scale (EDSS), *Neurology* 1983; 33:1444-52.

Mechanisms of neuropathic pain in a sample of charcot-marie-tooth 1 a: a laser evoked potential study

C. Pazzaglia^{1,2}, P. Caliendo^{1,2}, C. Vollono³, D. Ferraro¹, D. Le Pera⁴, P. Tonali^{1,2}, L. Padua^{1,2}, M. Valeriani³

¹Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy

²Fondazione Don Carlo Gnocchi Onlus, Italy

³Ospedale Pediatrico Bambin Gesù, Istituto di Neurologia, Rome, Italy

⁴San Raffele Pisana, Riabilitazione Neuromotoria, Rome, Italy

Introduction. Charcot-Marie-Tooth (CMT) disease is the most common inherited neuropathy. The CMT 1 A type can be considered the typical phenotype of this disease. Although pain is not considered a relevant symptom in CMT patients by physicians and no study assessed it comprehensively, this symptom is frequently complained by patients. **Materials and methods.** We evaluated 16 patients affected by CMT 1 A and 14 controls. All subjects underwent a standard LEP recording session and filled in the DN4. **Results.**

While the N2/P2 amplitude to foot stimulation was lower in CMT patients than in controls ($p=0.003$), no difference in LEP amplitude to both hand and face stimulation was found between patients and healthy subjects ($p>0.05$). **Conclusion.** This result is probably due to a length-dependent Ad-fiber loss which involves mostly the longer fibers coming from the lower limb. In our patients, a significant negative correlation was found between the N2/P2 amplitude to foot stimulation and the DN4 score ($p=0.02$), meaning that patients with the highest probability of neuropathic pain had also the lowest N2/P2 amplitude values to painful foot stimulation. This suggests that in our CMT 1 A patients neuropathic pain is probably related to a reduction of the Ad afferents.

References

Gemignani F, Melli G, Alfieri S, Inglese C, Marbini A. Sensory manifestations in Charcot-Marie-Tooth disease. *J Peripher Nerv Syst* 2004;9:7-14.
 Kakigi R, Shibasaki H, Tanaka K, Ikeda T, Oda K, Endo C, Ikeda A, Neshige R, Kuroda Y, Miyata K. CO2 laser-induced pain-related somatosensory evoked potentials in peripheral neuropathies: correlation between electrophysiological and histopathological findings. *Muscle Nerve* 1991;14:441-50.
 Bouhassira D, Attal N, Alchaar H, et al. Comparison of pain syndromes associated with nervous or somatic lesions and development of a new neuropathic Pain diagnostic questionnaire (DN4). *Pain* 2005;114:29-36.

Natural history of charcot-marie-tooth 2: 2-year follow-up of muscle strength, walking ability and quality of life

C. Pazzaglia^{1,2}, L. Padua^{1,2}, D. Pareyson³, I. Aprile^{1,2}, T. Cavallaro⁴, D.A. Quattrone⁵, N. Rizzuto⁴, G. Vita⁶, P. Tonali^{1,2}, A. Schenone⁷

- ¹Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy
- ²Fondazione Don Carlo Gnocchi Onlus, Italy
- ³Istituto Nazionale Neurologico "C. Besta", Milano, Italy
- ⁴Department of Neurological and Visual Sciences, Section of Clinical Neurology, University of Verona, Italy
- ⁵Azienda O.U. Policlinico di Catanzaro, Università di Catanzaro, Italy
- ⁶Department of Neuroscience, Psychiatry and Anaesthesiology, Azienda O.U. Policlinico di Messina, Italy
- ⁷Department of Neurological and Vision Sciences, Genova, Italy

Introduction. Charcot-Marie-Tooth (CMT) disease is the most frequent inherited neuropathy, no therapies are available at the moment but clinical trials are ongoing. For that reason it is very important to know the natural history of the disease. **Materials and methods.** We report the results of the natural history of clinical features and Quality of life (QoL) in patients with CMT2. Twenty patients were enrolled. At recruitment and at follow-up (2 years) all patients underwent neurological evaluation, QoL and disability assessments. The study-end evaluation took place 20 to 28 months after the baseline evaluation. **Results.** During the 2-year follow-up period, CMT2 patients showed a mild reduction of strength of distal-muscles of upper limbs and proximal muscles of lower limbs, a worsening sensory function and a mild increase in walking disability. However, there was no relevant worsening of QoL, except for a mild deterioration of one mental health domain. **Conclusion.** The results of the studies may indicate that over a 2-year period in CMT patients the slow progression of the disease is probably compensated by the development of adaptive strategies. Alternatively, we can hypothesize that the absence of significant changes in QoL and disability may be due to the unreliability, or little sensitivity to changes, of the adopted outcome measures.

References

Padua L, Pareyson D, Aprile I, et al. (2008) Natural history of CMT1A including QoL: a 2-year prospective study. *Neuromuscul Disord* 18(3):199-203.
 Apolone G, Mosconi P. (1998) The Italian SF-36 Health Survey: translation, validation and norming. *J Clin Epidemiol*;51 :1025-36.

Comparison between two rehabilitative approaches in institutionalized patients

G. Battistelli¹, A.R. Pellegrino², L Padua^{1,2,3}, B. Lucia¹

- ¹Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Pace, Rome, Italy
- ²Fondazione Don Carlo Gnocchi Onlus - Centro Santa Maria della Provvidenza, Rome, Italy
- ³Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy

Introduction. The current study analyzes 20 institutionalized inpatients of the "S. Maria della Provvidenza, Fondazione Don Gnocchi, ONLUS, Rome". The patients are affected by various pathologies but they share the presence of a medium-serious mental retardation. **Materials and methods.** The patients have been divided into two groups on the basis of two scales (Barthel and S.V.A.M.A.), the age and the period of institutionalization have been taken in consideration. The first group, the control group, has been treated with the "common" rehabilitative treatment and the occupational therapy, while the second, the experimental group, has been treated in addition with a multisensorial stimulation, based on the Snoezelen Method. The rehabilitative approach lasted 3 months each session was for 45 minutes: At the end of every session the following parameters have been recorded: degree of relation, level of motivation and attention scored from 0 to 3. Moreover the data about variation of vital parameters (cardiac frequency and pressure value before and after the sessions) have been collected since the multisensorial stimulation may influence them. **Results.** At the end of the study we observed the following results: the two groups had a score equal to 0 at the beginning of the study but during the following sessions the patients treated with the experimental protocol showed a higher motivation and attention respect to the ambient, while in the control group no changes were observed. Concerning the vital parameters we observed a normalization of the parameters and a reduction of mean values at long term, while in the control group the results were not constant and we didn't observe a normalization of the vital parameters at long term. **Conclusion.** We can conclude that the observed differences could depend to the quiet and relaxation due to the multisensorial stimulation.

References

Mahoney F, Barthel D. Functional evaluation: the Barthel Index. *Md Med J* 1965;14: 61-65.

Pain in post-surgical orthopedic rehabilitation: a don gnocchi multicenter study

L. Padua^{1,2}, R. Molino Lova², C. Pazzaglia^{1,2}, F. Cecchi²

- ¹Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy
- ²Fondazione Don Carlo Gnocchi Onlus, Italy

For pain in Rehabilitation Study Group. Participants: M Bacchini (Parma), S Bondi (Sarzana), D Cattaneo (Milano), F De Santis (Roma), M Forni (Sarzana), S Galeri (Rovato), M Maiolatesi (Falconara), C Manenti (Rovato), I Minciotti (Roma)*, A Montesano (Milano), AR Pellegrino (Roma), S Pierani (Falconara), A Popolizio (Firenze), A Romanelli (Firenze), M Rossi (Parma), G Russo (Roma)*.

* Data entry

Introduction. Patients affected by orthopaedic diseases often complain of pain and functional limitation and, along with trauma, these are the major reasons why patients undergo orthopaedic surgery. Post-surgical rehabilitation may be still limited by pain. The study intends to quantify and to characterize pain and to evaluate the occurrence of an interaction between pain and the rehabilitation process. **Materials and methods.** All inpatients attending rehabilitation for major lower limb orthopaedic surgery at a given time in all Centres involved in the study was eligible (7 Centres of the Don Gnocchi Foundation), pain was assessed at baseline and after 1 week of rehabilitation through validated pain measures. Moreover we assessed data on quality of life and clinical data. **Results.** Preliminary results (data from 2 centres must be still included in the analysis) based on 111 patients (72% of females, mean age 72.6 yrs, range 36-95, SD 11.4) showed that patients complained of severe pain: mean NRS at baseline was 49.3 while at the end 33.3 with significant improvement ($p<0.0000001$). In 38% of cases pain interfered with rehabilitation project and in 18% was the cause for stopping it. Interestingly, 51% of patients complained of probable/likely neuropathic pain. More severe pain was strongly related to the higher probability of having neuropathic pain. As expected most Quality of Life aspects were related with severity of pain. **Conclusion.** Preliminary data from the first multicentric pain study on Don Gnocchi rehabilitation centers, showed that Pain has a relevant role in patients undergoing lower limb post-surgical orthopaedic rehabilitation. Unexpectedly high occurrence of neuropathic pain was observed. Pain crucially interferes with rehabilitation process and the more severe pain is the neuropathic one.

References

Bachmann S, Wieser S, Oesch P, Schmidhauser S, Knüsel O, Kool J. Three-year cost analysis of function-centred versus pain-centred inpatient rehabilitation in patients with chronic non-specific low back pain. *J Rehabil Med*. 2009 Nov;41(11):919-23.

Construct validity of the ICF Core Set for Chronic Widespread Pain by Rasch analysis: can it be used as a measuring tool?

Y. Kurtais¹, D. Oztuna², A. Kucukdeveci¹, S. Kutlay¹, A. Genc¹, A. Tennant³

¹Ankara University Faculty of Medicine, Department of Physical Medicine & Rehabilitation, Ankara, Turkey

²Ankara University Faculty of Medicine, Department of Biostatistics, Ankara, Turkey

³The University of Leeds, Faculty of Medicine and Health, The General Infirmary at Leeds, Leeds, UK

Introduction. This study aimed to investigate the construct validity of the ICF Comprehensive Core Set for chronic widespread pain (CWP) in order to test its possible use as a measuring tool for functioning. **Materials and methods.** 100 consecutive female patients with CWP (mean age 42 yr) completed forms including demographic information, The Short Form-36 Health Survey (SF-36®), and the Fibromyalgia Impact Questionnaire (FIQ). Health professionals scored the ICF Core Set for CWP by interview. The internal construct validities of "Body functions-Body structures" (BF-BS), "Activity-Participation" (AP) and "Environmental" (E) domains were tested by Rasch analysis and reliability by internal consistency and person separation index (PSI). External construct validity was evaluated by correlating the Rasch transformed scores with SF-36 and FIQ. **Results.** After rescoring of some items showing disordered thresholds and deleting some items that did not fit to the Rasch model, the internal construct validities of the three scales (BF-BS 22 items, AP 24 items, E 16 items) were good [mean item fit (SD) were 0.044 (1.046), 0.141 (1.181) and -0.396 (1.162) respectively where perfect fit has mean of 0.0 and SD of 1.0]. Post-hoc tests showed that each set of items showed strict unidimensionality. The scales were largely free of differential item functioning (DIF) for age, gender, years of education and duration of disease. Reliabilities of the BF-BS, AP, and E scales were good with Cronbach's alphas of 0.88, 0.90 and, 0.79 and PSI's of 0.87, 0.91, and 0.77 respectively. Rasch scores of BF-BS, AP, and E showed moderate correlations with SF-36 and FIQ scores as expected. **Conclusion.** The BF-BS and AP scales derived from the ICF Core Set for CWP has been shown to be valid and reliable by Rasch analysis and might be used as an assessment tool after further clinical studies.

Compensatory visual training for patients with hemianopia after stroke

L. Gangoi, H. De La Corte, I. Villafriuela
Hospital del Tajo. Madrid. Spain.

Introduction. Homonymous hemianopia is the commonest form of acquired homonymous visual field defect; it can affect visual search and reading, producing alexia. For these patients we use different rehabilitative techniques such as eye movement-based therapies, in which the damaged visual field is more effectively sampled with compensatory or adaptive eye movements. **Materials and methods.** Four left occipital stroked patients with complete right homonymous hemianopia aged 40 to 70 years, took part. All gave informed consent. They were Spanish speaking and right-handed. All of them had complete impairment of right parafoveal vision assessed with a Humphrey perimeter. Recordings were made while the participants silently read 10 trails of single words, 10 trails each of three-and-five word arrays. For word arrays, the average fixation time per word was calculated. Single- word and text reading speed and comprehension and several cognitive functions were assessed in all patients. **Results.** Eye movement's rehabilitation attempts to improve visual performance by the application of a regularized framework of eye movement training, with practice over 20 hours of intensive training. As a group the patients had significantly shorter time in single word and text reading and comprehension after training ($p < 0.001$) and demonstrated a variety of mechanisms to account for this. Improvements were confined to the training period and maintained at follow-up. **Conclusion.** Patients with homonymous hemianopia can improve visual search and reading with practice. These changes translate to improvement overall reading and visual function, assessed objectively and subjectively, suggesting that they represent good training effects. The underlying mechanism may involve the adoption of compensatory eye movement strategies and these techniques all rely on mass practice.

References

Jacquín-Courtois S, Bays P, Leff A, Husain M. Rehabilitation for visual field defects: a dynamic ramp-step search paradigm. *J Rehabil Med* 2008;47:129.

Lipids targets achievement in euroaspire iii romania follow-up: from guidelines to clinical practice

L. Craciun¹, A. Avram², S. Iurciuc¹, C. Avram³, M. Iurciuc¹, C. Ciulacu², S. Mancas¹, D. Gaita¹

¹University of Medicine and Pharmacy "Victor Babes" Timisoara, Romania

²Municipal Hospital Timisoara

³West University Timisoara

Introduction. We proposed to evaluate the "reinforced" prevention measures that influenced lipids targets achievement according to ESC 2007 Prevention Guidelines in asymptomatic high risk patients included in the first EuroAspire III Follow-up. **Materials and methods.** We followed-up 325 patients (age 56±9 years, 62% women) out of 503 asymptomatic high risk patients included in EuroAspire III Romania Primary Care. These patients were evaluated every 6 months for a period of 18 months of follow-up by general practitioners (GP) that participated in a professional training performed by diabetologists and cardiologists and have been advised to reinforce lifestyle changes and to optimize hypolipemiant drug therapy in order to reach the targets mentioned in the current guidelines. **Results.** The percentage of dyslipidemic patients reaching the lipid targets significantly increased for LDL-cholesterol (1.8% versus 30.6% versus 45.7%, $p < 0.001$) and non-HDL-cholesterol (4.1% versus 23.52% versus 44.1%, $p = 0.002$). In a logistic regression model, reducing calories intake ($p = 0.03$), increasing fish oil consumption ($p = 0.04$), and increasing physical activity by following the recommendations of a sports instructor ($p = 0.008$) were independently correlated with LDL cholesterol target achievement. Similarly the attempt of weight loss ($p = 0.04$), LDL cholesterol level ($p = 0.04$) contributed significantly to non-HDL cholesterol target achieving in the univariate model. **Conclusion.** Preventive intervention, conducted by general practitioners, improved the lipid profile in dyslipidemic patients, even though the guidelines targets are far from being achieved. The data are similar with real life lipid management and highlighted that "reinforced" primary care represents a step forward from usual care and a model of changes applicable in other centers.

References

Graham I, Atar D, Boysen G, et al. European Guidelines on Cardiovascular Disease Prevention in Clinical Practice. *Eur J Cardiovasc Prev Rehabil* 2007; 14 (Suppl 2): S1-S113.

Readiness of revascularized coronary patients to increase their physical activity level

L. Craciun¹, A. Avram², S. Iurciuc¹, C. Avram³, M. Iurciuc¹, C. Popovici², S. Mancas¹, D. Gaita¹

¹University of Medicine and Pharmacy "Victor Babes" Timisoara, Romania

²Municipal Hospital Timisoara

³West University Timisoara

Introduction. To evaluate physical activity level in revascularized coronary patients included in EuroAspire III Romania – hospital arm. **Materials and methods.** Evaluation of the weekly physical activity level and the availability to participate in a structured exercise program after revascularization procedure (PCI or CABG) at 16±3 month after intervention according to gender, revascularization method and participation to the comprehensive cardiac rehabilitation program (CR). **Results.** The main baseline characteristics of analyzed group were: PTCA patients predominated (69.3%), most of the subjects were males (74.3%) and medium age in the entire group was 61±9.68 years. After myocardial revascularization and secondary prevention measures initiation, 62% of patients continued to be sedentary and 54% had no intention to adhere at a structured exercise program in order to increase their physical fitness and quality of life. Only one third of them performed moderate or intense weekly physical activity. CABG patients were more dedicated to participate in exercise training program than PTCA patients ($p < 0.05$). 31% of analyzed patients received the indication for CR inclusion while their compliance to the program was about 19%. Patients included in CR performed a significantly higher number of weekly METS (51.22±15.49 METS/week) than those who decline attending this program (33.75±22.89 METS/week) - $p = 0.00001$. **Conclusion.** The majority of revascularized coronary patients continued to be sedentary and did not intend to adhere to a regular physical training program in order to increase their physical fitness and quality of life. The assessment, counseling, and support in the maintenance of physical activity and identifying the main obstacles responsible for poor

compliance to CR are core tasks for healthcare system and physicians engaged in the secondary prevention of cardiovascular disease.

References

Graham I, Atar D et al. European Guidelines on Cardiovascular Disease Prevention in Clinical Practice. *Eur J Cardiovasc Prev Rehabil* 2007; 14 (Suppl 2): S1-S113.

A governance model for social health rehabilitation paths accessed via the "Punto Unico di Accesso" (PUA) (access point)

G. Frau¹, A. Lussu², A. Galleri³, R. Giuso⁴

¹Manager of District Coordination Department ASL di Cagliari

²Manager U.O.C. of Health and Social-Health rehabilitation ASI di Cagliari

³Head Physiatrist PUA ASL di Cagliari

⁴Head Physiatrist PUA ASL di Cagliari,

Introduction. The social health rehabilitation area requires a clinical management of the social health rehabilitation paths. The rehabilitation network, in the territory, is characterised by a plethora of scarcely integrated health and social health service providers (mainly private), historically lacking a model of global services on a regional scale or services that have actually obstructed the governance of the request. **Materials and methods.** The solution that the ASL di Cagliari has proposed and adopted consists in the implementation of a rehabilitation model based on the new paradigm: the culture of "people services" from reception and its continuation through out the different paths of the territorial services network. Capitalising on the specific skills of the professionals to understand the actual needs of the individual presenting a general request, often more complicated when evaluating the specific needs of the individual. **Results.** The results achieved are as follows: experimentation of an "organization and working model" of the PUA; the participation of all the subjects involved in the service network; uniformity in both the production of personalised rehabilitation projects and the evaluation system; information orientated towards increasing awareness relevant to the problem of disability aiming therefore for a change in approach and attitude rather than behaviour. **Conclusion.** The organization solution of the PUA permits the service to provide care for the disabled. "Providing care" using the multidimensional evaluation of the person's needs also tries to solve some of the distortions.

References

Gumirato G. (2007), Dal governo clinico a un sistema di governance, Atti di Convegno, 17 aprile 2007, PteExpo.
Longo F, Salvatore D., Tasselli S. (2008), "Le nuove missioni delle AUSL tra governo della produzione e dei consumi: un'analisi dei sistemi di controllo direzionale", *Mecosan*, n.66, pp 9-19.
Montanelli R., Turrini A. (2006), La governance locale nei servizi sociali; EGEA, Milano"

The role of the isokinetics methodology in the functional evaluation and in the rehabilitation of the impingement syndrome treated with the extra corporal electrohydraulics shock waves

A. Minerva, L. Amoroso, M.P. Lo Muzio, V. Rastelli, A. Russo, A. Maruzzi, M.A. Micello, M.S. Martone, M. Panunzio, G. Cassatella, S. Filoni, A. Santamato, P. Fiore

Dept of Physical Medicine and Rehabilitation, University of Foggia, Italy

Introduction. The aim of the study is to evaluate the role of the isokinetic exercise in the maximum and selective reinforcement of the stabilizing muscles of the shoulder of patients suffering from impingement syndrome treated with extra corporal electrohydraulics shock waves. **Materials and methods.** For this aim 30 patients have been enlisted with an average age of 42. All patients have been subjected to clinical ultrasound exams, to evaluation scales VAS, FIM and Constant Marley both in the pretreatment (t0) and in the post-treatment to 40 days (t1) and to 6 months (t2). The patients were divided in a random way in two groups A and B. The A group has been subjected to extra corporal electrohydraulics shock waves therapy and rehabilitative treatment, while the B group with a treatment with isokinetics methodology associated with extra corporal electrohydraulics shock waves. The exclusion criteria have been: disturbs of congenital and acquired coagulation, presence of heart

pacemaker, neoplasia local infections, serious heart disease, pregnancy and serious osteoporosis. The treatment with isokinetics methodology predicted a programme of concentric-concentric exercises, at a medium-high speed of the intra-extra rotator muscles of the shoulder. **Results.** We deduce that at t2 the patients of the B group present a superior functional recovery than the A group ones. **Conclusion.** The isokinetics methodology besides being a valid system of qualitative-quantitative evaluation of the active stabilizing of the shoulder allows a more rapid recovery of the synergic balance of the muscle forces that act on the articular complex of the shoulder

References

Camargo PR, Avila MA, Asso NA, Salvino TF Muscle performance during isokinetic concentric and eccentric abduction in subjects with subacromial syndrome *Eur J Appl Physiol*. 2010 Feb 4

Outcome oriented rehabilitation following postmastectomy breast reconstruction

V. Simone, M.P. Lo Muzio, M. Delli Bergoli, A. Russo, S. Filoni, M.T. Amoroso, M.A. Mimmo, M.S. Martone, A. Santamato, P. Fiore

Dept of Physical Medicine and Rehabilitation, University of Foggia, Italy

Introduction. The aim of this study was to define the role of a 6 month rehabilitation program on physical performance and quality of life in women after treatment for breast cancer. **Materials and methods.** Sixty women at a mean age of 62 years were studied. After initial valuation, 30 patients (group A) were randomly assigned to a 6-month rehabilitation program consisting in daily sessions of manual lymphatic drainage (Leduc technique) associated to slow movement of the arm and respiratory gymnastics. The other 30 patients (group B) were trained with lymphatic drainage. Physical function (Functional Independence Measure) and quality of life (Activity daily living) were determined at baseline and at the end of the exercise program. Every day we measured the circumference of treated arm and we tested range of motion (ROM). We valued pain (VAS) and shoulder motility disability (Constant Murley) at baseline and every one month until the end of the study. **Results.** We can say that prolonged, personalized rehabilitative program significantly increases the quality of life and improves autonomy in Activity daily living in women treatment for breast cancer. **Conclusion.** In conclusion, the positive influence of individual regular exercise on health, quality of life and emotional status can favour the best possible life standard. The combined treatment (lymphatic drainage, motor exercises, respiratory rehabilitation) had best performance.

References

Leduc, A.; I. Caplan, P. Lievens Masson -Traitement Physique de L'Oedema du bras. - Paris, 1981.
Berrino P, Santi P. Preoperative TRAM flap planning for postmastectomy breast reconstruction. *Ann Plast Surg*, 21(3): 264-72, 1988.

Effectiveness of a new device of electrical stimulation combined with botulinum toxin type A in the treatment of upper limb spasticity: preliminary results

A. Santamato, S. Filoni, A. Russo, F. Palano, A. Maruzzi, M.S. Martone, G. Di Gregorio, M.A. Mimmo, A. Minerva, L. Amoroso, M.T. Amoroso, A. Minerva, P. Fiore.

Dept of Physical Medicine and Rehabilitation, University of Foggia, Italy

Introduction. Spasticity is a disabling complication of upper motor neuron syndrome and it is responsible of deformities that may interfere with motor activities, hygiene and it can be painful and aesthetically unappealing. The aim of this work was to evaluate the effectiveness of botulinum toxin type A combined with a portable, non-invasive, hand-wrist orthosis (NESS H200) that consent a micro-processor controlled stimulation, in the treatment of focal spasticity after stroke. **Materials and methods.** A total of 10 patients affected by stroke associated with severe hypertonia in upper limbs were evaluated. Patients were treated with botulinum toxin in the upper arm and they were divided in two groups of treatment after injections: motor rehabilitation combined with electrical stimulation for five days on muscles injected (group A) and motor rehabilitation alone (group B). Evaluation was performed using Modified Ashworth Scale and Spasms Frequency Scale before and after 15 days of combined treatment. **Results.** Both groups showed a great reduction of spastic hypertonia and spasms as measured by

Modified Ashworth Scale and Spasm frequency scale at 15 days of follow up. Moreover, the difference between groups A and B was statistically significant. **Conclusion.** This device of electrical stimulation is a new therapeutical option for spasticity: it's easy and safety to wear also by care-givers. Further studies on a larger number of patients are required to compare different treatment strategies after botulinum toxin injections.

References

1. Brashear A, Gordon MF, Elovic E, Kassicheh VD, Marciniak C, Do M, Lee CH, Jenkins S, Turkel C for the Botox Post-Stroke Spasticity Study Group. Intramuscular injection of botulinum toxin for the treatment of wrist and finger spasticity after stroke. *N Engl J Med.* 2002;347:395-400.
2. Pandyan AD, Granat MH, Stott DJ: Effects of electrical stimulation on flexion contractures in the hemiplegic wrist. *Clin Rehabil* 1997;11:123-30
3. Carda S, Molteni F. Taping versus electrical stimulation after botulinum toxin type a injection for wrist and finger spasticity. A case-control study. *Clin Rehabil* 2005;19:621-626.

Safety and efficacy of a new botulinum toxin type A in the therapy of upper limb spasticity: clinical results after one year of treatment

A. Santamato, S. Filoni, G. Cassatella, F. Palano, A. Maruzzi, M.F. Micello, S. Santovito, L. Amoruso, M.T. Amoruso, A. Minerva, P. Fiore.

Dept of Physical Medicine and Rehabilitation, University of Foggia, Italy

Introduction. The object of this study is to assess the efficacy and safety of a new neurotoxin type A potentially free of protein aggregates, Xeomin NT 201, in the therapy of spasticity after stroke, after one year of treatment. **Materials and methods.** twenty patients were enrolled and were treated with Botulinum toxin type A for one year. Assessments were carried out before treatment and after fifteen days, using the modified Ashworth scale, the frequency spasm scale and the DAS. A final evaluation was done considering the value of the scales at baseline and after the last treatment. **Results.** In none of the twenty subjects were any adverse events reported: after fifteen days follow up and after the last evaluation there was a considerable, statistically significant, improvement in the clinical picture. **Conclusion.** our results confirm the efficacy and safety of a this type of neurotoxin potentially free of protein aggregates, therefore it's important increase the number of patients treated to confirm the absence of formation of antibodies which often occurs with treatments repeated frequently and at short intervals.

References

1. Lance JW. Symposium synopsis, in Feldman RG, Young RR, Koella WP (eds) Spasticity: Disordered Motor Control, Chicago: Year Book Medical,1980, pp. 485-494.
2. Brashear A, Gordon MF, Elovic E, Kassicheh VD, Marciniak C, Do M, Lee CH, Jenkins S, Turkel C for the Botox Post-Stroke Spasticity Study Group. Intramuscular injection of botulinum toxin for the treatment of wrist and finger spasticity after stroke. *N Engl J Med.* 2002;347:395-400.
3. Dressler D. Routine use of Xeomin in patients previously treated with Botox: long term results. *Eur J Neurol.* 2009 Dec;16 Suppl 2:2-5.

Short-term Effects of High-Intensity Laser Therapy versus Ultrasound Therapy in the treatment of low back pain: preliminary results

A. Santamato, G.Cassatella, F. Palano, A. Maruzzi, M.F. Micello, M.S. Martone, S. Santovito, L. Amoruso, M.T. Amoruso, V. Simone, A. Minerva, P. Fiore.

Dept of Physical Medicine and Rehabilitation, University of Foggia, Italy

Introduction. Low back pain (LBP) is a common and potentially disabling condition in adults. Nonoperative care of LBP includes a wide range of qualitatively different methods: lumbar supports, bed rest, oral analgesics and muscle relaxants, spinal manipulation, physical therapy, epidural steroid injections, and behavioral therapy. Not unsurprisingly, there are also a wide range of different levels of success or little information available. The aim of this study was to evaluate the short-term effectiveness of high-intensity laser therapy (HILT) versus ultrasound (US) therapy in the treatment of low back pain. **Materials and methods.** twenty patients were enrolled and were randomly assigned to a HILT group or a US therapy group. Study participants received 15 treatment sessions of HILT or US therapy over a period of 3 consecutive weeks. Assessments were carried out before treatment and after fifteen days, using the Oswestry

Scale (OS) and Visual Analogic Scale (VAS). **Results.** For the 20 study participants there were no between-group differences at baseline in VAS and OS scores. At the end of the 3-week intervention, participants in the HILT group showed a significantly greater decrease in pain than participants in the US therapy group. **Conclusion.** Participants diagnosed with LBP showed greater reduction in pain and improvement in articular movement functionality and muscle strength after 15 treatment sessions of HILT than did participants receiving US therapy over a period of 3 consecutive weeks.

References

Basford JR, Sheffield CG, Harmsen WS. Laser therapy: a randomized, controlled trial of the effects of low-intensity Nd:YAG laser irradiation on musculoskeletal back pain. *Arch Phys Med Rehabil.* 1999 Jun;80(6):647-52.

Mester E, Mester AF, Mester A. The biomedical effects of laser application. *Lasers Surg Med* 1985;5:31-9.

Beurskens AJHM, deVet HCW, Koke AJA. Responsiveness of functional status in low back pain: a comparison of different instruments. *Pain* 1996;65:71-6.

Exercise training in patients on hemodialysis improves dialysis efficacy and physical performance

V. Simone¹, P. Delli Carri², N. Querques², L. Amoruso¹, M. Delli Bergoli¹, A. Minerva¹, A. Russo¹, L. Bonghi¹, A. Maruzzi, M.F. Micello¹, A. Santamato¹, P. Fiore¹

¹*Dept of Physical Medicine and Rehabilitation, University of Foggia, Italy*

²*Struttura complessa di Nefrologia e dialisi Ospedali "Riuniti" Foggia, Italy.*

Introduction. Objective of this study was to determine the impact of a 12 month aerobic exercise training, on dialysis efficacy, physical performance, and quality of life in self-care hemodialysis (HD) patients. **Materials and methods.** Twenty chronic uremic patients (mean age 28-60 years) on maintenance hemodialysis were studied. After initial screening, ten patients (group A) were randomly assigned to a 12-month exercise training program (3/week) consisting of 120 minutes of cumulative duration using cycle ergometer. The other ten patients (group B) were trained with home exercise rehabilitation program and were used as control. The intensity of exercise was prescribed on an individual basis so that heart remained within 60-70% of the maximal heart rate achieved during the initial maximal oxygen consumption (VO₂ max) test. Renal function parameters were checked at baseline and every one month until the end of the study. The muscular strength was measured with a mechanical dynamometer. Physical function (6-minute walk test), and quality of life (Kidney Disease Quality of Life-Short Form) were determined at baseline and at the end of the exercise program. **Results.** Our study has demonstrated that prolonged, moderate-intensity exercise training significantly increases the quality of life and improves aerobic capacity in hemodialysis patients. **Conclusion.** The positive influence of individual regular exercise on health, quality of life, physical exercise capacity, endurance, muscle strength, social, professional and emotional status was very high in this patients.

References

Averbukh Z, Marcus E, et al. (1992). Effect of exercise training on glomerular filtration rate of mice with various degrees of renal mass reduction. *American Journal of Nephrology* 12:174-178.

The role of the rehabilitative treatment and of the electrohydraulics extra corporal shock waves in the painful shoulder

A. Minerva, L. Amoruso, M.P. Lo Muzio, M.A. Mimmo, G. Cassatella, V. Rastelli, S. Filoni, A. Santamato, P. Fiore

Cattedra e Unità Operativa di Medicina Fisica e Riabilitativa Azienda Ospedaliero-Universitaria Ospedali Riuniti Foggia

Introduction. The painful shoulder is a pathology with multifactorial aetiology that determines an analgesic functional limitation of the superior limb and consequently a reduction of autonomy in every day activities. The aim of the study is to demonstrate the efficacy of the rehabilitative treatment, associated to extra corporal electrohydraulics shock waves to reduce the algic symptomatology and to improve the quality of life in patients suffering from painful shoulder. **Materials and methods.** 30 patients have been enlisted aged from 35 to 50 suffering from painful shoulder. All patients have been subjected to clinical ultrasound exams, to evaluation scales VAS, FIM and Consrant Marley both in the pretreatment (t0) and in

the post-treatment to 40 days (t1) and to 6 months (t2). The study has predicted the subdivision of patients in a random way in two groups A and B. The A group has been subjected to **electrohydraulics** shock waves therapy, while the B group has been subjected to rehabilitative treatment associated to electrohydraulics shock waves therapy. For all the patients have been applied the following criteria of exclusions: disturbs of congenital and acquired coagulation, presence of heart pacemaker, neoplasia local infections, serious heart disease, pregnancy and serious osteoporosis. **Results and conclusion.** The preliminary long term results (t2) in the patients of the B group authorize us to underline the importance of the rehabilitative treatment practiced after an adequate strumental analgesic and trofic therapy like the electrohydraulics shock waves in improving the functionability of the superior limb and therefore the quality of life of the patients suffering from painful shoulder.

References

Rompe JD, Bürger R, Hopf C, Eysel P. Shoulder function after extracorporeal shock wave therapy for calcific tendinitis. *J Shoulder Elbow Surg* 1998;7:505-9.

A proposal of a rehabilitative protocol in the adult obese

A. Minerva, V. Rastelli, M.A. Mimmo, S. Santovito, G. Cassatella, S. Filoni, V. Simone, M.S. Martone, M.F. Micello, A. Santamato, P. Fiore

Dept of Physical Medicine and Rehabilitation, University of Foggia, Italy

Introduction. The aim of this study is to define the role of a long term personalized rehabilitative treatment and adapted to the disability grade to recover autonomy in the primary and secondary activities of everyday life in obese adult people. **Materials and methods.** 40 obese patients have been enrolled (B.M.I.: 30-34,9 kg/m²) (age from 40 to 60). All the patients have been evaluated with clinical and physiatrics exams, VAS, FIM, IADL, Borg and Tinetti scale in the pre-treatment and post-treatment (6 months). The criteria of exclusion have been: serious heart disease, diabetes mellitus of type II decompensated, polyneuropathy, osteoarthropathy and a serious inflammatory stage, neoplasia, serious osteoporosis. A respiratory re-education programme to prevent the dyspnoea, exercises of the abdominal muscles, exercises of reinforcement of the inferior limbs muscles, exercises of motory coordination in aerobiosis were done into the patients. **Results.** From the preliminary long term results we deduce an improvement in the locomotor mobility and ability with recovery of autonomy in the primary ADL. **Conclusion.** In conclusion, the rehabilitative approach of the obese, cannot disregard a valuation and a multidisciplinary treatment: for the preservation and the stabilization of the body weight of an individual it is useful to associate a balanced diet and a regular physical activity that can promote the psychophysical wellbeing and the best possible life standard.

References

Peeters A., Bonneux L, Nusselder WJ, De Laet C., Barendregt JJ. Adult Obesity and the burden of disability throughout life life. *Obes Res* 2004;12(7):1145-51.

Locked-in Syndrome: use of Botox toxine to superior limbs for the non verbal communication

V. Leoni; P. Belloglio; M. Callistri; S. Garbarino;G. Nunziati
Asl4 Cbiavarese

Introduction. Our work describes the clinic case of a patient with incomplete Locked-in Syndrome and serious spastic tetraparesis following a ponto-mesencephalic ischemia, which was treated with Botox toxine to superior limbs in order to help the motorius recovery for the training in the use of communicative aids. **Materials and methods.** The examined patient present a flexor pattern to superior limbs with folding of elbows, wrists and fingers and extremely pronation posture, which does not allow to efficiently indicate the boxes of the alphabetic chart. After the inoculation of the pronator teres muscle (m.), pronator quadratus m., flexor carpi ulnaris m. of both superior limbs, and of the bicipitis brachii m. of left and brachio radialis m. of right, functional bendages were done with Tensoplast and progressive ritensioning with tape in supination and extension of the wrist. This was followed of intensive muscular streatching, stretching postures and elettrotherapy antagonist muscles. The appli-

cation of compressive neuromuscular taping (TNM) was usefull for the activity of supinator muscle through the stimulation of sensory canals. **Results.** An improvement in the function gesture was found as the consequence of a wider forearm's supination, with active extension of elbow, wrist and fingers, specially in the left side. The patient now can use the alphabetic chart while she couldn't previously reach the communicative aim. The resulting movement is been used to successfully select the boxes of the alphabetic communicator with vocal synthesis. **Conclusion.** The verbal cominucation is not possible in a patient with Locked-in Syndrome and a serious neurologic frame, so our aim is to simplify the communication through the use of adequate aids.

Rehabilitation in critical illness

M.L. Rey-Pita, J.G. Armenteros-Pedrero, J. Muñoz-Mateo, R. Fiorillo, C. Fernandez-Caamaño, V. Lourido-Estevez

Rehabilitation Service. Complejo Hospitalario de Pontevedra . Pontevedra. Spain

Introduction. Early rehabilitation begun in the intensive care unit (ICU) is emerging as an important strategy both to prevent and to treat ICU-acquired weakness, in an effort to facilitate and improve long-term recovery. Studies conducted to date suggest that such ICU-based rehabilitation is feasible, safe, and effective for carefully selected patients. We wanted to know what the demand for rehabilitation of patients admitted to the ICU, and if we performed adequately monitor patients until discharge to home **Materials and methods.** Retrospective study on 47 consecutive patients admitted to the ICU on which we asked for consultation to the Rehabilitation. We conducted a descriptive study of the variables age, sex, time in the ICU when we conducted the consultation, most common conditions and tratment after discharge home. **Results.** 36 men and 11 women were studied. Chest physiotherapy was the principal demand of rehabilitation . Critical illness polyneuropathy (CIP) and myopathy (CIM) were major complications of severe critical illness and its management_. 20% of patients followed in an outpatient rehabilitation treatment after discharge home. **Conclusion.** Prolonged stays in the intensive care unit and mechanical ventilation are associated with functional decline and increased morbidity, mortality, cost of care, and length of hospital stay. Implementation of an early mobility and walking program could have a beneficial effect on all of these factors. This study is the first necessary step to meet our performance at the critical patient, in order to determine if more action is needed early on our part, resulting in fewer complications and a possible earlier discharge

References

1. National Institute for Health and Clinical Excellence (2009) Rehabilitation after critical illness. London: National Institute for Health and Clinical Excellence. Available from: www.nice.org.uk/CG83.
2. Beraldo PS. Rehabilitation in patients admitted to intensive care. *BMJ*. 2009 Oct 16; 339.
3. de Jong AF, Kompanje EJ, Hofhuis JG, Spronk PE, Schrijvers GA, Bakker J. Functional status after intensive care. *J Rehabil Med*. 2009 Sep;41(9):780; author reply 780-1.
4. Schweickert WD, Pohlman MC, Pohlman AS, Nigos C, Pawlik AJ, Esbrook CL, Spears L, Miller M, Franczyk M, Deprieto D, Schmidt GA, Bowman A, Barr R, McCallister KE, Hall JB, Kress JP. Early physical and occupational therapy in mechanically ventilated, critically ill patients: a randomised controlled trial. *Lancet*. 2009 May 30;373(9678):1874-82.

Strontium ranelate effects in patients with bed rest syndrome. Clinical and instrumental evidence after 60 days of treatment

A. Rocco^{1,2}, R. Di Donna¹, G. Pacifici¹, M. Penna¹, S. Gentili³, J.V. Faroni¹

¹*INI Monteripoli Rehabilitation Clinic, Tivoli (Italy)*

²*Instrumental Semeiotic Division SIMFER*

³*Rehabilitation Department of Tor Vergata University, Rome (Italy)*

Introduction. Osteoporosis is characterized by bone fragility that accompanies an increased risk of fracture. Getting old occurs a progressive imbalance between bone resorption and new formation. This can be true in several other circumstances. These include: Bone subjected to a mechanical reduction as a result of bed rest syndrome (immobilization). Presence of reduced sex hormone concentrations such as after the menopause in females. Long Corticosteroids therapies used for treatment of a variety of conditions as like arthritis or asthma. **Materials and methods.** Sonic DMB allows precise and a reproducible measurement system, the phalanx is a home largely

representative of changes in bone mass (1). Thirty patients with bed rest syndrome were assessed at admission to hospital with clinical examination, rating scales (barthel index, rivermead mobility index) and MOC QUS. Patients have been cared for and brought to rehabilitation project in which there was explicit in the program Pharmacotherapeutic use of strontium ranelate (2 g/die)(2) (3) (4) combined with vitamin D3 (25,000 IU/month). Patients began their journey of rehabilitation after 60 days were examined and the revaluation MOC QUS administration of rating scales. **Results.** In the 80% of the population studied the results obtained showed a significant trend for the recovery of bone density e for the improvement of the values obtained by the administration of rating scale as early as after the second month of treatment. **Conclusion.** This improvement means that strontium ranelate represents a therapy of choice for the treatment of osteoporosis in patients with bed rest syndrome.

References

1. Blake G M, Wahner H W, Fogelman I. The evaluation of osteoporosis: dual x-ray absorptiometry and ultrasound in clinical practice. London: Martin Dunitz Ltd; 1999 .
2. Wien Klin Wochenschr. 2005 Nov;117(21-22):728-38. Strontium ranelate: a novel concept for the treatment of osteoporosis
3. Drugs Today (Barc). 2003 Feb;39(2):89-101. Strontium ranelate: a new paradigm in the treatment of osteoporosis. Reginster JY, Deroisy R, Jupsin I.
4. Curr Pharm Des. 2002;8(21):1907-16. Strontium ranelate in osteoporosis. Reginster JY.

Effectiveness of the treatment with peri-tendinous injection of hyaluronic acid in degenerative tendinopathy

A. Rocco^{1,3}, G. Tancredi^{2,3}, C. Foti^{2,3}

¹INI Medicus Monteripoli Rehabilitation Clinic, Tivoli (Italy)

²PRM Chair, Doctorate and Specialization School, Tor Vergata University, Rome (Italy)

³Instrumental Semeiotic Division SIMFER

Introduction. Sodium Hyaluronate are glycosaminoglycans with unbranched polysaccharide chain, formed by residual of glucuronic acid e N-acetilglucosamina. Polymers are organized in a reticular structure with high density and clear macroscopic aspect and a microscopic structure able to guarantee idratation, plasticity e viscosity of tissue. The aim of the study is to appraise the efficacy of injection treatment of hyaluronic acid with different molecular weight in patients affected by degenerative tendinopathy. **Materials and methods.** Forty patients suffering from degenerative condition of Achilles tendon (1) and of III-IV hand flexor tendon (2) were subjected to a cycle of number 3 infiltrations of hyaluronic acid with different molecular weight (MW 500-1200 Kdalton) once a week. The Physiatrix evaluation was completed by instrumental examination by a system consisting of echographic linear probe (10,5-12,5 MHz) (3), a Power Doppler examination and with the administration of rating scales of mobility and pain (VAS and Rivermead Mobility Index, Test of manual dexterity). Infiltrative treatment was performed after locating the degenerated area through the ultrasound examination with a multiple dosing peri-tendon using a 'needle, 25 G 0.5 X 16 mm. **Result and conclusion.** The patients evaluated at 6 weeks after the third infiltration have presented a significant improvement in clinical parameters with reduction of pain, improvement of range of movement (ROM) and consequent reduction of disability related to the underlying condition. A preliminary analysis of data showed a different behavior of the drug as a function of molecular weight and the seat of inoculation.

References

1. Effect of hylan G-F 20 in Achilles' tendonitis: an experimental study in rats. Tatari H, Skiak E, Destan H, Uluku, C, Ozer E, Sato S. Arch Phys Med Rehabil. 2004 Sep;85(9):1470-4. PMID: 15375818 [PubMed - indexed for MEDLINE]
2. Ultrasound-guided hyaluronic acid injection in carpometacarpal osteoarthritis: short-term results. Salini V, De Amicis D, Abate M, Natale MA, Di Iorio A. Int J Immunopathol Pharmacol. 2009 April-June;22(2):455-460. PMID: 19505398 [PubMed - as supplied by publisher]
3. Open pilot study of ultrasound-guided intra-articular injection of hylan G-F 20 (Synvisc) in the treatment of symptomatic hip osteoarthritis. Migliore A, Tormenta S, Martin LS, Valente C, Massafra U, Granata M, Alimonti A. Clin Rheumatol. 2005 Jun;24(3):285-9. Epub 2004 Dec 9. PMID: 15592903 [PubMed - indexed for MEDLINE]
4. Efficacia del trattamento infiltrativo con acido ialuronico nella tendinopatia degenerativa dell'achilleo. A. Rocco, G. Tancredi, C. Foti (Roma) 37° Congresso Nazionale SIMFER 20-23 Settembre 2009, Campobasso.

Depression in spondyloarthropathy and low back pain patients: a pilot study

S. Milutinovic, M. Svenda-Zlatkovic, M. Zlatanovic, G. Radunovic
Institute of Rheumatology, Belgrade, Serbia

Introduction. The disease severity and functional status of many patients are considerably influenced by depression. This mental condition is mostly underestimated in rheumatology. **Aim of study.** To investigate the frequency of depression and its correlation in spondyloarthropathy and chronic low back pain patients (pts). **Materials and methods.** 26 pts with spondyloarthropathy-SpA and 24 with chronic low back pain-LBP were studied. Data were collected according to age, sex, disease duration, erythrocyte sedimentation rate-SE, c-reactive protein level-CRP, the visual analogue scale-VAS for pain and Beck Depression Inventory-BDI. For SpA pts, BASFI and BASDAI were collected. BDI score 9-16 was classified as mild, 17-30 as moderate and ≥ 30 as severe depression. None of the patients used antidepressives. All analyses were carried out by SPSS 16.0 (frequencies, Mann Whitney test, Pearson and Spearman correlations). **Results.** Statistical differences comparing SpA/LBP-pts were noted in age (45,23/54,58 yrs, $p=0.013$) and SE (33,45/11,72, $p=0.001$). Differences concerning sex, disease duration, CRP level and VAS were not found. Mean BDI-score was 10,38 for SpA-pts and 13,50 for LBP-pts ($p=0,077$). According to BDI-scores, 45,8% of SpA-pts and 62,4% of LBP-pts were depressed. Among them 30,6% and 25% pts had minor, 7,6% and 37,6% pts had moderate and 7,6% and 0% pts had severe depression for SpA and LBP group, respectively. For SpA-pts, positive correlation was found between BDI-score and disease duration, SE, BASFI and BASDAI. For LBP-pts correlation was detected between BDI-score and disease duration and VAS. **Conclusion.** Approximately half of SpA and LBP pts have symptoms of depression. Depression was correlated with disease duration, SE and functional status for SpA-pts, and with disease duration and degree of pain for LBP-pts. For pts with chronic rheumatologic diseases, treatment of depression could have positive influence on their functional status and rehabilitation results.

Effects of a robot-assisted locomotor training on EMG activation in sci subjects

G. Stampacchia¹, E. Bradascchia¹, A. Gerini¹, S. Mazzoleni², E. Cattin², B. Rossi¹, M.C. Carrozza²

¹Dipartimento Neuroscienze, Azienda Ospedaliera Universitaria Pisana

²Scuola Superiore Sant'Anna Pisa

Introduction. In order to assure stepping repeatability, a robotic gait orthosis (Lokomat, Hocoma AG, Switzerland) was recently added to the body weight support (BWS) treadmill training, in spinal cord injured subjects (SCI) rehabilitation. We study the changes of muscle recruitment after the robotic training. **Materials and methods.** Eight SCI subjects, ASIA C(2), D (6) with lesion level ranging from C8 to L1, 33-70 years old, six males two females performed four weeks of robotic training. Each subject, before and after the training, performed both robot-assisted and unassisted treadmill exercise, at different velocities and percentages of BWS. Surface EMG measurements from rectus femoris (RF), biceps femoris (BF), tibialis anterioris (TA) and medial gastrocnemius (GA), were recorded bilaterally. During each session, the subject was asked to stay relaxed ("Passive") or to contribute to the motion supported by the robotic system ("Active"). **Results.** Before the training all subjects were unable to walk without the robot assistance. Moreover, the muscle recruitment was very poor in the "Passive" condition, higher during the "Active" condition. After the training the muscle recruitment increased, especially in the RF. Furthermore, the subjects recovered the ability to walk on the treadmill using BWS, without the robot assistance. In this last condition the EMG recordings show a higher activity, mainly on distal muscles (TA and GA), if compared to the "Passive" and "Active" conditions. **Conclusion.** The increase in the RF muscle recruitment observed after the robotic training suggests that this kind of rehabilitation stimulates spinal plasticity, eliciting the neuronal network activation. The higher muscle recruitment observed during unassisted treadmill exercise suggests the possibility to introduce this modality of walking rehabilitation as a second step after the robotic training.

Comparison the of effects of frequency modulated neural stimulation and transcutaneous electrical nerve stimulation on clinical and magnetic resonance imaging findings of lumbar disc herniation

B. Koc¹, B. Nacir¹, H. Rana Erdem¹, A. Karagoz¹, H. Yigit²

¹2nd Department of Physical Medicine and Rehabilitation, Ankara Training and Research Hospital, Ministry of Health, Ankara, Turkey

²Department of Radiodiagnostic, Ankara Training and Research Hospital, Ministry of Health, Ankara, Turkey

Introduction. Frequency Modulated Neural Stimulation (FREMS) is a new type of transcutaneous electrical stimulation (PhyBack) characterized by sequences of electrical impulses, which vary in frequency, intensity and duration according to a predetermined sequence. This study measures and compares the outcome of FREMS and transcutaneous electrical nerve stimulation (TENS) therapies by using magnetic resonance imaging (MRI) and clinical parameters in patients presenting with low back pain caused by lumbar disc herniation (LDH). **Materials and methods.** Forty-one patients, diagnosed with LDH using MRI, who had complaints of back and/or leg pain were enrolled in this study. The patient group was subdivided randomly into two groups; 26 patients received FREMS (group 1) and 15 patients received TENS (group 2). Treatment consisted of 15 sessions over a period of 3 weeks. Each treatment sessions were consisted of 40 minutes of FREMS or TENS therapy. MRI examinations were done before and one month after the treatment. Physical examination of the lumbar spine, severity of pain, functional disability by Roland-Morris Disability Questionnaire and Modified Oswestry Disability Questionnaire were assessed at baseline, immediately after, and at one month after treatment. **Results.** There were no differences between groups regarding demographic features and outcome measures at initial evaluation ($p > 0.05$). There were significant reductions in pain and disability scores between baseline and follow-up periods ($p < 0.01$), but there was not significant difference between the 2 treatment groups at any of the 3 interview times ($p > 0.05$). There were no significant reduction of size of the herniated mass on MRI after treatment in both groups. **Conclusion.** Both FREMS and TENS have positive effects on LDH. These results suggest that FREMS may have an important role in the treatment of LDH as a new electrotherapy modality.

Limb loading in hip arthroplasty female patients for a variety of daily activities

A. Oksanen, A. Myllymäki, J.J. Salminen

Department of Physical Medicine and Rehabilitation, Turku University Central Hospital, Turku, Finland

Introduction. The total hip replacement surgery usually results in a marked decrease in pain. However, little is known about the physical ability and bilateral limb loading in patients without guided physiotherapy in the early phase after the unilateral hip arthroplasty. **Materials and methods.** The follow-up study is a part of a study investigating the effect of bone quality on early stability of cementless primary hip prosthesis. A subgroup of 56 female patients with primary hip osteoarthritis scheduled for cementless total hip arthroplasty recruited for functional tests before and six months after hip surgery. Temporal gait variables at a natural speed and vertical forces under each foot during sit-to-stand and step-up-and-over tests were measured. **Results.** After the hip surgery, the gait velocity and the cadence were significantly increased and the differences of the step length and the duration of the single support phase between the operated and non-operated leg were significantly decreased compared with those variables preoperatively. The duration of the single support phase showed no significant difference between the limbs in the postoperative phase. In addition, in the step-up-and-over test, the differences of the lift-up force, impact force and movement time between the limbs were significantly decreased compared with those variables preoperatively. However, especially the impact force showed further a significant difference between the limbs in the postoperative phase. In the postoperative phase, in the sit-to-stand test, the rising force was significantly increased and the difference of the weight bearing between the limbs was significantly decreased compared with the variables in the preoperative phase. In the sit-to-stand test, the sway velocity and the weight transfer time showed no significant differences between the two time points. **Conclusion.** These preliminary follow-up results demonstrate improvements in the daily activities and limb loading in the early phase after hip arthroplasty.

References

- Miki H, Sugano N, Hagio K, Nishii T, Kawakami H, Kakimoto A et al. Recovery of walking speed and symmetrical movement of the pelvis and lower extremity joints after unilateral THA. *Journal of Biomechanics* 2004;37:443-455.
- Mäkinen TJ, Alm JJ, Laine M, Svedström E, Aro HT. The incidence of osteopenia and osteoporosis in women with hip osteoarthritis scheduled for cementless total joint replacement. *Bone* 2007;40:1041-1047.
- Talis VL, Grishin AA, Solopova IA, Oskanyan TL, Belenky VE, Ivanenko YP. Asymmetric leg loading during sit-to-stand, walking and quiet standing in patients after unilateral hip replacement surgery. *Clinical Biomechanics* 2008;23:424-433.

Acute Coronary Syndrome: Comparative cost between acute management and rehabilitation program

M.F. Rojas, E. Marco, M. Alzate, S. Ruiz, R. Boza, A. Guillen, J.M. Muniesa, E. Duarte

Physical Medicine and Rehabilitation Dept. Hospital del Mar. Parc de Salut MAR, Barcelona, Spain.

Introduction. Acute coronary syndrome (ACS) as a major source of mortality and morbidity has increased health care demand and costs worldwide. Despite cardiac rehabilitation (CR) saves lives cost-effectively and improves physical performance and quality of life of patients after an acute coronary syndrome (ACS), the majority of cardiac patients in Spain are denied any chance of taking part in CR programs. The study objective was to characterize resource use and cost for ACS and compare the contribution of length of stay (LOS), procedure use and rehabilitation program to total cost. **Materials and methods.** A micro-costing study was conducted on 127 patients (64.4 years old, male 78%) referred to CR after suffering ACS during the year 2008 in a tertiary hospital in Barcelona (Spain). The registry included demographic, medical history, treatment and discharge information to capture all resource used. Hospitalization cost was estimated by imputed discharge diagnosis-related group code and adjusted for the LOS and procedures. Rehabilitation costs were estimated from data of the National Audit of Cardiac Rehabilitation survey in Britain. **Results.** The average LOS was 1.87 in the coronary care unit (CCU) and 6.02 days in the Cardiology ward. The mean cost of hospitalization was 8057.6 (SD 3642.5) euros (including number and type of diagnostic and treatment procedure performed). Estimated CR cost was 465 euros per patient, although only 51.2% of patients completed the CR program. **Conclusion.** These estimates can be used to study the cost-effectiveness of interventions proven to reduce morbidity and mortality after ACS. It does not seem reasonable to assume such a high cost in the acute phase if after that, it is not feasible to optimize results by the implementation of CR programs. Rehabilitation departments should emphasize cost-effectiveness of this treatment to increase health care contributions to encourage its application to become more available.

Non-neurogenic sphincter insufficiency in a child

S. Magalhães, J. Macedo, S. Amorim, A. Trepa

Santo Antonio General Hospital Oporto (Portugal)

Introduction. The International Children's Continence Society defined urinary incontinence as "the involuntary loss of urine, objectively demonstrable, and constituting a social or hygienic problem." The causes of urinary incontinence can be divided in three main groups: functional causes (ex. enuresis, psychogenic retention and bladder instability); neurogenic causes (ex. myelomeningocele) and anatomical causes (ex. epispadias, ureteral duplications). **Case Report.** An 11-year-old girl was sent to the consultation of bladder-sphincter dysfunction for study and treatment of urinary incontinence by congenital urethral sphincter insufficiency. She has a clinical of urinary incontinence during day and night since birth and recurrent urinary infections since the age of 5. She was investigated for Pediatric Urology and did a Magnetic Resonance Imaging (MRI) that demonstrated bilateral ureteral duplication. She was submitted to a bilateral-upper-pole nephrectomy. Repeated MRI for persistent symptoms of severe urinary incontinence that showed a marked dilatation of the urethra. The urodynamic study (2010) showed severe sphincter insufficiency at rest and with the retention effort and urinary losses with very low abdominal pressures. Without detrusor hyperactivity neither low compliance. The patient began a programme of pelvic floor biofeedback training at department. She is a very probably candidate for a collagen injection. **Conclusion.** A through clinical data will delineate the pattern of incontinence and may identify

underlying neurologic or structural anomalies. That is a rare case of intrinsic sphincter insufficiency that leads a urinary loss with very small efforts, in a female child that was born with a urethral dilation. She had also a bilateral ureteral duplication and vesicoureteral reflux. In the literature review we don't found reports of similar cases.

References

Norgaard JP et al. Standardization and definitions in lower urinary tract dysfunction in children. *Br J Urol.* 1998;81(suppl 3):1-16.
 Vištjaya V., Eric A. Jones. Primer: Diagnosis and management of uncomplicated daytime wetting in children. *Nat Clin Pract Urol.* 2006;3(10):551-559.

Home cardiac rehabilitation. An experience of alternative treatment for selected patients

P. Devetti, M. Sellan, P. Ursig, E. Fabbro, M. Werren, S. Baroselli, E. Petri, M. Carone, D. Tuniz.
Cardiac Rehabilitation Unit, Department of Rehabilitation Medicine, IMFR, Udine, Italy

Introduction. The aim of this study is to verify the validity of Home Rehabilitation as an alternative treatment for selected patients, clinically stable, without severe comorbidity, who are not able to attend the ambulatory program of the Cardiac Rehabilitation Center, because of logistic difficulties. **Materials and methods.** 5 patients recruited: 4 aortic valve replacements, 1 PTCA. Mean age: 80 years (68-90). Protocol: 1) In Hospital: to teach to patient (or care giver) self management training; BP, HR and RPE scale measuring; how to perform exercise training suggested; to recognize possible signs and symptoms; 2) Give illustrated manual about home rehabilitation exercises program: forms to be fulfilled with parameters measured. 3) program duration: 2-3 times a week for 4-8 weeks checked by weekly telephone calls; 4) at the beginning and end of the program: cardiac check up, functional evaluation (6MWT), physical therapy assessment (Berg scale, Vittorio test) and quality of life (EuroQol EQ-5D). **Results.** None new cardiovascular event happened and measured parameters improved, except for Flexibility and Coordination (unchanged): Strength of lower limbs +18,29%, upper limbs +25,88%; Balance + 38,9%; overall results of 5 items of EQ-5D improved. Visual analogical scale (VAS) of overall health: + 13,64% vs. the most improved state of health imaginable. RPE Score: -20,63% Dyspnea Score: -34,62%. HR: -25,40%, SBP: -10,18% DBP: -16,20% SpO₂ +1,05%. 6MWT average distance travelled: + 16,44% (range 210-245 m). **Conclusion.** The Home Rehabilitation method in selected patients proved to be safe and efficient.

References

1. Karapolat H: Comparison of hospital-based versus home-based exercise training in patients with heart failure: effects on functional capacity, quality of life, psychological symptoms, and hemodynamic parameters. *Clinical Research in Cardiology* July 30, 2009
 2. K. Jolly: Home based cardiac rehabilitation compared with centre-based rehabilitation and usual care: a systematic review and meta-analysis, *International Journal of Cardiology* 111(2006) 343-351

The effects of inpatient rheumatologic rehabilitation programs on the function and disease activity in chronic rheumatoid arthritis and ankylosing spondylitis: one-year follow-up

F. Figen Ayhan, Rukiye Yazıcı, M. Geçene, Pınar Borman, Z. Rezan Yorgancıoğlu
Ankara Training and Research Hospital, 1st Clinic of PRM, Ankara, Turkey

Introduction. Both rheumatoid arthritis (RA) and ankylosing spondylitis (AS) are chronic inflammatory rheumatic diseases leading to chronic pain and disability. There are very limited data about the impact of inpatient rehabilitation for patients with RA and AS. The aim of this controlled study was to evaluate the long-term effects of inpatient rehabilitation using composite disease activity measures and widely used functional instruments in patients with RA and AS. **Materials and methods.** Totally 120 eligible patients with RA and AS were included this study after giving informed consent. Patients were excluded having variations in DMARDs therapy at any time during trial and dependence in activities of daily living. Randomized selected patients were equally distributed as rehabilitation and control groups (30 patients in each group). **Results.** Mean age and disease duration of patients with chronic RA were 51.8 ±11.7 and 8.5 ±6.4 years, respectively. Profile plots of HAQ and DAS28 were shown in figure 1. and figure 2. HAQ scores improvements were

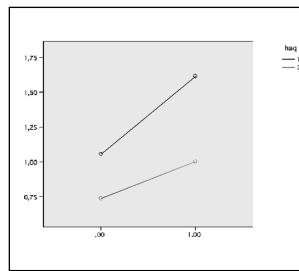


Figure 1.

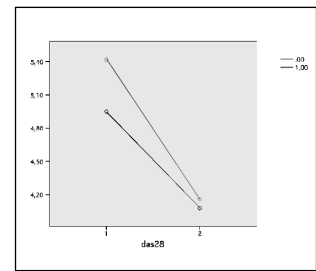


Figure 2.

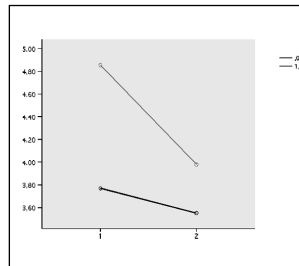


Figure 3.

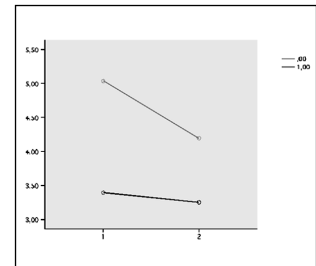


Figure 4.

better in rehabilitation group than controls. Mean age and disease duration of patients with AS were 39.7±10.4 and 8.7±7.8 years, respectively. Profile plots of BASFI and BASDAI were shown in figure 3. and figure 4. BASFI and BASDAI scores improvements were same in both groups. As seen in figures inpatient care is reserved for patients who have the most advanced rheumatic diseases with the most functional impairment. Inpatient rheumatologic rehabilitation programs improved physical function and disease activity in patients with RA and AS. However, statistically significant improvement was detected only HAQ scores of RA patients. **Conclusion.** Since patients' functioning is a central aspect of the rheumatic diseases, multidisciplinary rheumatologic rehabilitation programs should be applied to all of these patients ranging from home exercises to inpatient rehabilitation.

Functional recovery in fragile elderly after discharge from a geriatric acute care unit

M.D. Sánchez, P. Puertas, O. Sabartés, M. Pi-Figueras, M. Arellano, M.A. Márquez
Geriatric Acute Care Unit. Hospital de la Esperanza. Instituto de Atención Geriátrica i Sociosanitaria (IAGS). Parc de Salut Mar. Barcelona. Spain.

Objective. To select functional recovery variables in elderly patients after a hospital stay in a Geriatric Acute Care Unit (GACU). **Materials and methods.** 148 patients, with a mean age of 84 years, were included. They had suffered > 20% lost of their previous functional capacity, measured by Barthel Index (BI), after GACU admission and they were transferred to the Intermediate Care Unit (ICU) with the purpose of regaining functional capacity. Functional loss after GACU admission and functional improvement in ICU was determined in all patients. Functional loss: (previous BI-BI at GACU discharge/previous BI) x 100. Functional recovery: (BI at ICU discharge - BI at GACU discharge / previous BI-BI at GACU discharge) x 100. Relationship with the following variables: age, sex, functional status prior to GACU admission and at GACU discharge (measured by BI), cognitive status (measured by Pfeiffer test (PT)), nutritional status (albumin, cholesterol) and appearance of immobility and delirium during GACU stay, was determined. **Results.** Functional recovery in ICU was positively related to BI at GACU discharge (p 0.04) and negatively related to functional loss at GACU discharge (p 0.02) and to PT (p 0.004). No relationship with age, sex, nutritional status, previous functional status or appearance of immobility and delirium during GACU stay was founded. **Conclusion.** Functional recovery in elderly patients after hospital admission for acute medical illness is not determined by previous functional status but by functional loss during acute illness and their functional status at discharge. Cognitive status determines functional recovery in elderly patients.

Effectiveness and Efficiency of Rehabilitation in a Subacute Care Geriatric Unit

D. Sanchez Rodriguez¹, M. Pi-Figueras¹, M Arellano¹, J.M. Muniesa², M.A. Marquez¹, O. Sabartés¹

¹Geriatrics, IAGS, Parc de Salut Mar, Hospital de la Esperanza, Barcelona

²Physical and Rehabilitation Medicine, Parc de Salut Mar, Hospital de la Esperanza Barcelona

Introduction. Subacute Care Geriatric Unit (SCGU) is a new postacute care assistance level in Geriatric Units which is aimed to focus on medical care, re-education of walking and activities of daily living recovery in elderly patients who, owing to disability after some medical or surgical process, would benefit from short follow-up and rehabilitation. **Objectives.** To evaluate characteristics, effectiveness and efficiency of rehabilitation treatment in elderly in-patients admitted to Subacute Care Geriatric Units. **Materials and methods.** Retrospective study of a cohort of in-patients in a Subacute Care Geriatric Unit during 2008 and 2009. Comorbidity (measured by Charlson Index), functional status prior to acute illness, at admission and at discharge (measured by Barthel Index), functional income, efficiency and modified Heinemann Index were studied. **Results.** 251 in-patients were evaluated (45.8% men), mean age 82 ED 8.5 years. Comorbidity was high (Charlson Index 3.03 ED 2.47): dementia 42.6%, heart failure 27.5%, lung disease 33%. Average stay was 14.4 ED 9.8 days. Barthel Index prior to the current disease was 74.3 ED 24.7 and at hospital admission was 29.4 ED 20.1. After rehabilitation treatment at discharge, Barthel Index was 60.9 ED 27.1. Functional income was 31.14 ED 19.5 points of Barthel and average efficiency was 2.5 points of Barthel per day of stay. Functional ability recovered regarding the loss (modified Heinemann Index) was 73.6 %. **Conclusion.** The result of our data shows an increasingly functional income, efficiency and functional benefit in elderly disabled patients after a following short rehabilitation treatment in Subacute Care Geriatric Units

Functional and cognitive outcome following traumatic, cerebrovascular and anoxic brain damage: study in 390 patients with severe acquired brain injury (ABI)

M. Gandolfi, L. Roncari, P. Girardi, R. Avesani, M.G. Gambini, V. Varalta, P. Ianes, A. Picelli, A. Fiaschi, N. Smania

Centre of Neuromotor and Cognitive Rehabilitation, Department in Neurological and Visual Sciences, University of Verona (Italy)

Ospedale Sacro Cuore Don Calabria, Rehabilitation Department, Negrar-Verona (Italy).

Introduction. Acquired brain injury (ABI) may lead to significant impairments of individual's cognitive, physical and psychosocial functioning and it is considered a leading cause of lifelong disability¹. Studies about functional and cognitive outcome in severe ABI patients often concern traumatic aetiology. Only few studies regard non-traumatic aetiology outcome and different aetiological categories of this group are often not subdivided. The aim of the study was to compare functional and cognitive outcome of different aetiological ABI groups and to identify clinical predictive variables of returning home. **Materials and methods.** 390 ABI patients consecutively admitted to Sacro Cuore, Don Calabria Hospital, Negrar, Verona (Italy) from 2004 to 2007 were enrolled. Patients presented different ABI aetiologies (234 traumatic, 123 cerebrovascular e 33 anoxic). Clinical and demographic data were retrospectively recorded: age, sex, aetiology, acute length of stay (ALOS) and rehabilitation length of stay (RLOS), discharge destination, GCS, Glasgow Outcome Scale (GOS), Disability Rating Scale (DRS), Levels of Cognitive Functioning (LCF) and Functional Independence Measure (FIM). **Results.** Traumatic patients presented a lower mean age, a greater male sex percentage, shorter ALOS and RLOS and a better functional and cognitive outcome than other aetiological groups considered. The worst outcome corresponded to anoxic patients. Admission DRS score resulted the best clinical predictive variable of returning home in ABI patients. **Conclusion.** Traumatic patients presented a better functional and cognitive outcome than other aetiological groups. Admission DRS score was resulted a good clinical predictor of returning home in ABI patients.

References

- Cullen N.K., Park Y.G., Bayley M.T.: Functional recovery following traumatic vs non-traumatic brain injury: A case-controlled study. *Brain Injury*, 2008; 22: 1013-1020.

Influence of oral apraxia in dysphagia recovery :study on 36 patients with stroke

M. Gandolfi, P. Zuccher, A. Picelli, A. Fiaschi, N. Smania

Centre of Neuromotor and Cognitive Rehabilitation, Department in Neurological and Visual Sciences, University of Verona (Italy).

Introduction. Dysphagia affects 29% to 81% of patients in the acute stage after stroke¹ and it exposes patients to poor prognosis². Oropharyngeal motor and sensory deficits are considered an important cause of swallowing disorder after stroke³. However, the influence of buccofacial apraxia in swallowing recovery after stroke is not reported in literature. The aim of the study is to evaluate the influence of oral apraxia in the recovery of dysphagia in patients after stroke. **Materials and methods.** 36 patients with dysphagia after stroke, cooperating, receiving total nutrition via nose-gastric tube feeding and who had undergone fiberoptic laryngoscope were enrolled in the study. The outcome measures were: the Dysphagia Outcome and Severity Scale (DOSS) at the admission and discharge, the Schröter-Morasch classification of aspiration severity and the number of days of artificial feeding in the first 3 months after stroke. Multiple linear regression analysis was done to clarify the prognostic role of motor and sensory deficit and buccofacial apraxia on the aspiration and the artificial feeding duration. **Results.** Buccofacial apraxia correlates with lower DOSS score at the discharge and with longer artificial feeding duration. Oropharyngeal motor and sensory dysfunction correlates with aspiration at the fibrolaryngoscopic assessment. **Conclusion.** Buccofacial apraxia in patients with acute stroke is a negative prognostic factor for swallowing recovery after stroke.

References

- Falsetti et al. Oropharyngeal Dysphagia after Stroke: Incidence, Diagnosis, and Clinical Predictors in Patients Admitted to a Neurorehabilitation Unit; *strokecerebrovasdis* 2009;18:329-335.
- Ramsey et al. Early assessment of dysphagia and aspiration risk in acute stroke patients. *Stroke* 2003;34:1252-1257.
- Sellers et al. Swallowing Abnormalities after Acute Stroke: A Case Control Study *Dysphagia* 1999;14:212-218.

Grip-lift rehabilitation in chronic stroke adults

D. Dispa¹, T. Lejeune^{1,2}, J.L. Thonnard^{1,2}

¹Université catholique de Louvain, Institute of Neuroscience, Bruxelles, Belgium

²Université catholique de Louvain, Cliniques universitaires Saint-Luc, Physical Medicine and Rehabilitation Department, Bruxelles, Belgium

Introduction. Most of chronic stroke patients show difficulties in manipulation of objects. Previous studies (McDonnell 2006, Hermsdörfer 2003) highlight deficits in the grip-lift task with the paretic hand. The aim of this study was to test if an intensive program (8 weeks) of precision grip training would improve the grip-lift coordination. **Materials and methods.** Ten patients followed two consecutive sessions (unilateral or bilateral) of four weeks rhythmic repetitive grip-lift task oriented rehabilitation with auditory cueing (1 h/day, 3 days/week). The subjects were assessed at four times: 4 weeks before rehabilitation (t_0), immediately before the first rehabilitation session (t_1), after 4 weeks of rehabilitation (t_2), after 8 weeks of rehabilitation (t_3). Tip pinch strength, digital dexterity, manual ability, satisfaction (with activities and participation) and grip-lift force coordination were assessed. **Result.** At t_0 , there was a significant difference between the non-paretic and the paretic hand (paired t-test) for tip pinch force, digital dexterity and a grip-lift parameter (loading phase). A one way repeated measure ANOVA, across the 4 evaluations, showed (1) the stability of the scores between the first and the second evaluation, and (2), despite the fact that the patients reported subjective improvements, no objective improvement of either measured variable, after 8 weeks of intensive specific rehabilitation, for the paretic hand and for the non-paretic hand. **Conclusion.** We were not able to objectify any significant improvement in strength, dexterity, manual ability, satisfaction (with activities and participation) and grip-lift coordination after 8 weeks of rhythmic grip-lift task oriented bilateral and unilateral intensive rehabilitation.

References

- Hermsdörfer, J, Hagl E, et al. (2003). "Grip force control during object manipulation in cerebral stroke." *Clin Neurophysiol* 114(5):915-29.
- McDonnell, MN., Hillier SL, et al. (2006). "Impairments in precision grip correlate with functional measures in adult hemiplegia." *Clin Neurophysiol* 117(7):1474-80.

WebRehab; the Swedish database for rehabilitation

Block Å Lundgren Nilsson¹, M. Lannsjö², A. Tölli³, K. S. Sunnerhagen¹, A. Sörbo¹, U. Flansbjer⁴

¹Neuroscience and physiology, University of Gothenburg, Sweden

²Rehabilitation medicine, Sandviken, Sweden

³Rehabilitation medicine, Stockholm, Sweden

⁴Rehabilitation medicine, Lund.Orup, Sweden

We have created a web-based database for inpatient rehabilitation in Sweden, launched in 2007. The aim with the database is to improve 1) quality in the rehabilitation process, 2) use limited resources better, 3) enhance awareness of the ICF model, 4) support the participating units rehabilitation process developing, 5) make comparison between units possible, 6) to gather knowledge of rare conditions, 7) to be used for research. 20 of the country's 21 areas are represented and 2008 there were 1868 registrations for admittance. Data are gathered at admittance, at discharge and 1 year after onset of disease/trauma. The database contains information on demographics, diagnoses, problems within different domains of ICF. Process measures: time from referral until admission, resources, time of care, whether questions on tobacco, alcohol and drugs have been asked, setting up and using a rehab plan, if assessment for driving has been performed, use of different assessment instruments. Result measures: Complication and medical events, ADL in and out, BMI in and out, EQ5D in and out, deceased, discharged to, patient satisfaction with the rehab process, And for acquired brain injury GOSE. The online registration is working. There is room for improvement in the rehab process; we are not having enough registrations on BMI which can be seen as a measure of quality of care. Sexual problems often not addressed. Rehab plans are not always set up, however when they are present, they are used. Patient satisfaction is high.

Robotic training can improve interjoint coordination and muscular activation in chronic hemiplegic stroke

M.C. Carboncini¹, A. Frisoli², G. Greco², I. Creatini¹, C. Procopio², L. Bonfiglio¹, B. Rossi¹, M. Bergamasco²

¹Neurorehabilitation Unit, Department of Neurosciences, Azienda Ospedaliera Universitaria Pisana, Pisa, Italy

²PERCRO (Perceptual Robotics) Laboratory, Scuola Superiore S. Anna, Pisa, Italy

Introduction. The aim of this study was to investigate the effects of robotic-assisted rehabilitation training with a upper limb robotic exoskeleton in a group of nine patients with chronic hemiparetic stroke. **Materials and methods.** All patients enrolled in the study were administered a robotic assisted rehabilitation training for a period of 6 weeks including reaching and spatial antigravity movements, and underwent before and after training, both a kinesiological and electromyographic examination to measure joint trajectories, interjoint coordination of arm movements and pattern of surface EMG during reaching movements. Degree of functional impairment at the enrolment and discharge recovery was also measured by clinically evaluation with Fugl-Meyer scale, Modified Ashworth Scale and Range of Motion measures. **Results.** The robot aided training induced, independently by time of stroke, statistical significant improvement of both clinical (4.6±4.2 increase in FMA), kinesiological and EMG parameters. In particular results showed that after robotic training, in the affected arm movement times and performance errors were significantly reduced, while regularity of wrist motion, elbow aperture in reaching and range of active and passive joint motion were incremented. On the other hand, the interjoint coordination of movements measured as elbow-shoulder coordination presented a disrupted pattern, improved after training. **Conclusion.** These kinesiology assessments of motor performance after rehabilitation training may contribute to the development of training protocols that take into account the time course of improvement for reaching task into different portions of the extra personal space.

References

- Broeren J, Bjorkdahl A, Claesson L, Goude D, "Virtual rehabilitation after stroke", *Stud Health Technol Inform*, 2008; 136:77-82.
Prange G, Jannik M, Groothuis-Oudshoorn C, Hermens H, " Systematic review of the effect of robot-aided therapy on recovery of the hemiparetic arm after stroke", *J Rehab Res Dev*, 42(2), 171-184,2006.

The first three weeks after a stroke: analysis of care processes and outcomes

B. Bernardini¹, A. Grasso¹, S. Fracchia¹, S. Ghirmai¹, M. Pagani¹, G. Cerina¹, C. Corsini¹, M. Arleo¹, S. Respizzi¹, S. Marcheselli²

¹Dipartimento di Riabilitazione e Recupero Funzionale.

²Neurologia d'Urgenza e Stroke Unit.

IRCCS Istituto Clinico Humanitas, Rozzano (Milano).

Introduction. We conducted a prospective observational cohort study involving 56 acute stroke patients in the Stroke Unit of our Institute. Aims of the study were: a) to describe the prevalence and duration of nursing, medical treatments and physiotherapy; b) to explore relationships among key-care processes and between processes and functional outcomes. **Materials and methods.** We developed a standardized core-set of 35 binary indicators (presence/absence of target condition) to identify patients' care needs. Indicators are clustered in three areas: medical (e.g. vital signs monitoring, medical instability, alertness, infections), nursing (e.g. dysphagia, pain, tube feeding), and physiotherapy (e.g. dependence in alimentation, bed mobility, ambulation). We designed a monitoring chart to track care processes and we daily applied it to patients from admission to discharge or until 21st day of stay. Moreover we administered Oxfordshire Community Stroke Project classification (OCPS), National Institute of Health Stroke Scale (NIHSS) and Barthel Index (BI) to classify stroke syndromes and measure neurological/functional impairment and disability. **Results.** 14.3% of 56 patients (mean age 75.6±12.0) were classified as Total Anterior Circulation Syndromes. NIHSS and BI mean scores on admission resulted respectively 9.2±5.9 and 33.7±31.8. Continuous vital signs monitoring was applied in 92.8% of patients with a mean of 5.9±5.4 days. Treatment of infections, oxygen therapy, urinary catheter presented the highest prevalence; dysphagia, tracheostomy and communicative disability were the longest key-care processes. Prevalence and duration of processes were significantly related to NIHSS score. Length of stay in Stroke Unit resulted 10±7.5 days; 39.6% of patients were admitted to our subacute rehabilitation. We found a significant inverse correlation between medical and nursing treatments duration and functional recovery. **Conclusion.** Nursing, medical treatments and physiotherapy are interactive and mutually conditioned care processes in stroke patients. Our indicators core-set appeared a simple, reliable method to track clinical path. Our data suggested that early identification of key-care problems and their well-timed management may promote a better and quicker functional recovery.

References

1. Stroke Unit Trialists' Collaboration. Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke (Cochrane Review). In: The Cochrane Library, Issue 1 2003. Oxford: Update Software.
2. Bernardini B et al. Diagnosi sindromica e percorsi clinici post acuti dei pazienti con ictus. *Eur Med Phys* 2008; 44 suppl. 1 to No. 3

Engaging Children in the Design of Rehabilitative Games

R.J. Holt, M.J. Allsop, A.P.H. Weightman, J.F. Gallagher, M.C. Levesley, N.J. Preston, B. Bhakta

University of Leeds

Introduction. The value of involving users in the design of healthcare technology is increasingly recognised, to ensure it meets their needs. Children have particular characteristics which make them challenging to engage in the design process. This poster will review some of these challenges, methods developed in the field of Human-Computer Interaction (HCI) (Markopoulos et al, 2008) to address these, and how these can be transferred to the design of healthcare technologies. **Materials and methods.** The design of a joystick interface which allows children with arm impairments to perform reach/retrieve exercises by playing a videogame is used as a case study (Weightman *et al.* 2009). Children were involved in two ways: a user group of children with cerebral palsy provided input on the design of software and hardware throughout development, and 40 children from local schools evaluated the games using a Fun Toolkit developed in the HCI domain (Markopoulos et al, 2008). **Results.** The games received positive responses, despite being based around simple forward-backwards movements. Several usability problems were identified and corrected. Children were able to use the Fun Toolkit to evaluate the games, but struggled to provide meaningful feedback on aesthetics and social acceptability. **Conclusion.** Engaging children in the design of healthcare technology pre-

sents a range of challenges – current HCI methods go some way towards addressing issues of usability and enjoyment, but there is a lack of tools to effectively assess social acceptability of technology for children.

References

- Markopoulos P, Read J, MacFarlane S and Hoysniemi J (2008) Evaluating Children's Interactive Products: Principles And Practices For Interaction Designers, Morgan Kaufmann.
- Weightman APH, Preston N, Holt RJ, Allsop M, Levesley MC, Bhakta B. (2009) Engaging Children in Health Care Technology Design: Developing Rehabilitation Technology for Children with Cerebral Palsy. *Journal of Engineering Design*. First published : 25th March 2009 (iFirst).

Functional assessment of patients with total hip replacement following three different surgical approaches

L. Berti, M.G. Benedetti, M. Boschi, K. Cremonini, S. Giannini
Movement Analysis Laboratory, Istituto Ortopedico Rizzoli, University of Bologna, Italy

Introduction. The purpose of this study is to investigate the influence of three different surgical approaches (direct lateral, posterior and minimally-invasive anterior) for total hip replacement on the early recovery of gait in patients with the same implant design and operated by the same surgeon. The hypothesis is that the minimally-invasive (MIS) anterior approach provides earlier and better gait performance. **Materials and methods.** Thirty patients are enrolled for this longitudinal study, randomised for the MIS anterior (10 patients), posterior (10 patients) or direct lateral approach (10 patients). Patients are assessed by means of Harris Hip Score (HSS) and SF-36. Gait analysis during level walking is performed using a Vicon 612 system, two Kistler forceplates and a Zero-Wire system for muscle activity. Patients are controlled before surgery, 7 days, and 3 months after surgery and compared to a control group of healthy subjects matched for age and sex. **Results.** Clinical assessments reveal good quality of life and excellent HSS in all patients at 3 months after surgery. Hip kinematics shows an improvement with the best sagittal ROM for the anterior approach group at 3 months. Hip joint moments are reduced in the sagittal and coronal planes, especially in the direct lateral approach. Extra-rotation moment at the hip is mainly reduced in the posterior group. Surface EMG shows a good recovery of muscles timing of activation in all the patients at 3 months. **Conclusion.** The MIS anterior group reveals the best performance in gait, probably associated to a lesser damage of either abductor or external rotators muscles. The functional assessment of THR by means of gait analysis provides relevant outcome information, with respect to the surgical approach, for the tailored rehabilitation protocol.

References

- Bennett D et al., *Gait Posture* 2006

Combined GangTrainer GT1 and Transcranial Direct Current Stimulation in gait rehabilitation in chronic stroke patients: a randomized control trial

C. Geroin¹, D. Munari¹, A. Waldner², S. Hesse³, C. Werner³, A. Picelli¹, A. Fiaschi¹, M. Gandolfi¹, A. Zambito⁴, N. Smania¹
¹Centre of Neuromotor and Cognitive Rehabilitation, Department of Neurological and Visual Sciences, University of Verona, Italy
²Casa di Cura Privata Villa Melitta, Bolzano, Italia
³Medical Park Berlin, Charité-University Medicine, Berlin, Germany
⁴SSO Riabilitazione Policlinico G.B. Rossi Verona, Italia

Introduction. Transcranial direct current stimulation (tDCS), has shown to facilitate motor recovery after stroke [1]. Several studies reported the efficacy of GangTrainer I therapy (GT) in gait rehabilitation in patients with stroke. Aim of this study was to assess the efficacy of GT therapy associated with tDCS in patients with chronic stroke. **Materials and methods.** 32 patients underwent ten, 50-minute, training sessions, over a 2-weeks period. Each session consisted of: a 30 minutes GT with tDCS applied in the first 7 minutes for group 1 (EG); a 30 minutes GT performed for group 2 (CG1); a 50 minutes conventional training for group 3 (CG2). Patients were evaluated before (T0), immediately after (T1) and 2 weeks after the end of training (T2) by means of the Six minutes walking test (6MinWT), Ten meters walking test (10MWT), Barthel Index Scale (BI), Rivermead motor assessment score (RMAS), Modified Ashworth Scale (MAS), Functional Ambulation Category (FAC), Motricity Index

(MI) and spatio-temporal gait analysis. **Results.** At T0 and T1 evaluations in the before/after comparison, EG and CG1 showed a significant improvement in the 6minWT, 10MWT, RMAS, FAC, MI and spatio-temporal gait parameters (step length, speed, cadence, single and double support time). These improvements were maintained at T2. No significant changes were found for the CG2. No significant changes were found between EG and CG1. **Conclusion.** The GT showed to improve gait in chronic stroke patients. Exposure to direct current polarization in combination with GT 1 didn't improve gait performance more than only GT training.

References

1. Pohl, M., et al. Repetitive locomotor training and physiotherapy improve walking and basic activities of daily living after stroke: a single-blind, randomized multicentre trial. *Clin Rehabil*, 2007.21.

Comparison of single and paired transcranial magnetic stimulation in the evaluation of spinal cord injuries

G. Isoardo^{1,2}, I. Rosso², E. Chesi², A. Palmitessa^{1,2}, G. Facciani², M.V. Actis²
¹SSCVD Neurofisiologia
²SC Neurochirurgia
³Unità spinale unipolare, AO CTO-Maria Adelaide, Torino

Introduction. TMS is one of the neurophysiological tools to assess the degree of motor impairment in patients with spinal cord injury. In this study, we compared single stimulus (sTMS) to paired stimulus TMS (pTMS) for assessment of corticospinal tract impairment in these patients. **Material and methods.** Nine patients were selected (5 males, 4 females, age: 61.5 years) affected with incomplete spinal cord injury (7 traumatic, 2 ischemic). ASIA level was C in 6, in 3. Neurological level was C5 in 2, C6 in 2, C8 in 1, D11 in 1, D12 in 1, L1 in 2. TMS was performed with aMA-PRO stimulator with a 11 cm round coil placed at vertex, with biphasic single or double stimuli (ISI 20 ms, equal intensity). Motor evoked potential were recorded from vastus medialis, tibialis anterior and extensor digitorum brevis (EDB) muscles bilaterally. Only in 1 patient EBD was not evaluated. **Results.** sTMS elicited MEPs in 28/48 muscles, whereas pTMS in 34/48. Therefore MEPs were elicited in 6 muscles by pTMS but not sTMS. All 14 muscles in which MEPs were absent after pTMS had a MRC score 0-1. Five of 34 in which pTMS but not sTMS elicited MEPs had a MRC score 0-1. the remaining 29 had a MRC 2-5. **Conclusion.** We confirmed previous results (McKay et al, 2005), suggesting that pTMS is more sensitive to evaluate corticospinal tract conduction in patients with spinal cord injury. The physiologic mechanism may be related to a facilitation at spinal level by the conditioning stimulus. An interesting observation is that pTMS may elicit MEPs even muscles with severe weakness.

References

- McKay WB, Lee DC, Lim HK, Holmes SA, Sherwood AM. Neurophysiological examination of the corticospinal system and voluntary motor control in motor-incomplete human spinal cord injury. *Exp Brain Res*. 2005 Jun;163(3):379-87.

Peripheral nerve involvement in patients with traumatic complete cervical and thoracic spinal cord injuries

G. Isoardo^{1,2}, I. Rosso², E. Chesi², A. Palmitessa^{1,2}, G. Facciani², M.V. Actis²
¹SSCVD Neurofisiologia
²SC Neurochirurgia
³Unità spinale unipolare, AO CTO-Maria Adelaide, Torino

Introduction. Patients affected with complete spinal cord injuries are at risk of peripheral nerve diseases due to entrapment or traumatic lesions, as well as critical illness neuropathy (CIP) due to sepsis occurring during the acute phase of the disease. Peripheral nerve diseases may impair the neurophysiologic evaluation of both recovery from spinal shock (Hiersemenzel LP et al, 2000) as well as studies on conduction of corticospinal tract by transcranial magnetic stimulation. **Material and methods.** Ten patients (2 males, mean age 40 years) with complete cervical and thoracic spinal cord lesions (ASIA A) underwent: 1) bilateral motor nerve conduction studies (NCS) of peroneal and tibial nerves and sensory NCS of sural nerve 2) F-wave minimal latency and persistence of the peroneal and tibial nerves 3) evaluation of H-reflex from the soleus muscle. Five patients had cervical lesions (C6 in 4, C4 in the remaining) and 5 had thoracic lesions (D4 in 2, D6 in 2 and D12 in the remaining).

Results. M-responses were reduced or absent symmetrically in both peroneal and tibial nerve in 3 patients. Sural sensory action potentials (SAP) were absent bilaterally in 3 patients. In two patients, sural SAP and peroneal ant tibial CMAP were absent monolaterally. H-reflex and F waves were not elicitable in the patients with absent M-responses. **Conclusion.** In 50% patients abnormal NCS suggested the presence of peripheral nerve disease. Two patients had abnormalities suggesting a sciatic nerve lesion, but others had more symmetrical abnormalities that should be interpreted with caution: in fact they may be expression of a CIP or a spinal shock. Further studies are needed to evaluate the precise nature of these abnormalities and their relationship with motor outcome.

References

Hiersemenz LP, Curt A, Dietz V. From spinal shock to spasticity: neuronal adaptations to a spinal cord injury *Neurology*. 2000 Apr 25;54(8):1574-82.

Use of CT imaging in subjects with acquired severe brain injury: a retrospective study

T. Giorgini, L. Monti Bragadin, A. Voltazza, L. Iona, E. Biasutti, P. Di Benedetto

Gervasutta Rehabilitation Hospital, Udine (Italy)

Introduction. Almost all patients with an acquired severe brain injury (i.e. trauma or major bleeding) undergo head CT as the first imaging test. Early CT findings are used in determining diagnosis and prognosis. Further CT tests are performed to examine evolution of the damages detected and to suggest surgical interventions, when needed. We have to consider enhanced radiation risk determined by repeated CT tests. **Materials and methods.** We performed a retrospective study on 34 inpatients affected by acquired severe brain injury and recently recovered in Gervasutta Rehabilitation Hospital. We examined 22 males and 12 females, 22 after traumatic brain injury and 12 after a major bleeding. Average age was 49 years. We reported the amount of CT imaging performed from acute event to the end of rehabilitation. **Results.** An average amount of 7 CT brain imaging tests were performed on each subject. A further average amount of 2 CT imaging tests on each subject were performed on different districts (i.e. lung, abdomen). Each subject underwent an average amount of 10 CT tests (max: 19, min: 4). In traumatic group was performed an average amount of 6 brain TC tests, while an average of 10 brain TC tests in hemorrhagic group. However, the number of all CT examinations (including other districts) is not so different between the two groups. **Conclusion.** Subjects affected by acquired severe brain injury who undergo a rehabilitation program as inpatients are often investigated with a considerable amount of CT imaging tests (from 4 to 19 in this report). A so great number of CT tests must be carefully evaluated balancing diagnostic necessities and increasing radiation risk.

References

Fayngers V, Passero M. Estimating radiation risk from computed tomography scanning. *Lung* (2009) 187:143-148.
Smith-Bindman R, Lipson J, Marcus R, Kim KP, Mahesh M, Gould R, Berrington de González A, Miglioretti DL. Radiation dose associated with common computed tomography examinations and the associated lifetime attributable risk of cancer. *Arch Intern Med*. 2009 Dec 14;169(22):2078-86.

Walking speed changes after functional surgery in the first motoneuron syndrome

L. Granella¹, M. Marconetto², P. Imazio¹, L. Molino³

¹Regione Piemonte ASLTO5 S.C. di Recupero e Rieducazione Funzionale Ospedale Maggiore Chieri

²Regione Piemonte ASLTO5 S.C. Ortopedia Ospedale S. Croce Moncalieri

³Università degli Studi di Torino Facoltà di Medicina E Chirurgia Scuola di Specializzazione in Fisioterapia

Introduction. Aim of the study was to test the action of functional surgery on the hemiplegic leg in walking speed and the changes in initial velocity by pathology and by the time elapsed from the acute event. **Materials and methods.** 29 patients, 9 males and 10 females, aged 56.7, 21 strokes, 5 Multiple Sclerosis and 3 cerebral palsy over 18 years old, were treated with elongation of the achilles tendon: 13 by Hoke, 10 by Hoke + mioentesis surgery from more proximal access, 5 only by mioentesis surgery, 1 by Z lengthening and calcaneus osteotomy. In combination were performed: 14 SPLAT, 16 resections of the fingers flexors, 3 TP lengthening, 1 transposition of the EPA Walking speed on 25 m was measured before

and after surgery. **Results.** In all patient before surgery the average speed was 29.39 m / min, after surgery it increased by 34.87%. In group with speed from 0 to 20 m/min (average 11,12) speed increased by 71.57%, in group with speed from 21 to 40 m / min (average 30.27), increased by 30.277%, in Group with speed over 40 m/min (average 59.45), increased by 3.644%. In CP before surgery the average speed was 65.54 m/min, after surgery it decreased by -4.45%. In MS it was 35.7 m/min before surgery and increased by +5.4% after. In stroke it was 22.73 m/min before and increased by +47.5% after. In treated patients before 2 years from stroke (6 patients) the average speed was 12.46 m/min, and it increased by 111.65% after. In treated patients after 2 years (15 patients) average speed was 26.84 m / min, 21.851 % more after surgery. The walking speed generally improved. A low initial velocity corresponds with a great speed increase, almost exponentially. The CPs decreased walking speed but they were a small number and high speed walkers. Strokes had the lowest speed walking and attained the greatest increase. Multiple Sclerosis with a slightly higher walking speed of strokes increased significantly less. The operated within two years, with walking speed moderately lower, had a much higher increase. **Conclusion.** The slower was the walking speed before the functional surgery, the more it improved after it. Slower patients had surgery first, but they showed the best results after. Multiple sclerosis increased walking speed less than Stroke cases.

Effects of Low-Level Laserotherapy on functional status in different clinical periarticular disorders of shoulder

V. Savic

Institute of rheumatology, Resavska 69, Belgrade, Serbia

Leading pathological cause of shoulder pain syndrome is tendon inflammation. **Main goal.** To investigate therapeutic effects of low-level laser therapy (LLT) on functional status in subacromial bursitis, rotator cuff and biceps tendinitis. **Materials and methods.** Randomised, prospective study, included 60 patients with shoulder pain, comparable regard to sex, age and concomitant diseases. Diagnosis made regard to clinical, radiological and ultrasonographic examination. Concerning diagnosis, patients divided in three groups (20 pts): Group A: subacromial bursitis, 8 male, 12 female, aged 52.46±5.21, Group B: rotator cuff tendinitis, 8 male, 12 female, aged 45.21±6.43, Group C: biceps tendinitis, 11 m, 9 f aged 54.28±6.33. Patients in each of the three diagnostic groups were divided in two therapeutic subgroups (10 pts). Group I treated with: laserotherapy Midlaser, Irradia λ904 nm, ν 5000 Hz, X points, D 10 J/cm², X therapies. II group: treated with local CS (Betamethasone Diprofos 1 ml), repeated one week after. Pendylar free-swinging exercises were given to all patients. Measured parameters: pain (VAS), local functional status (Constant Murley functional scale), movements range. Wilcoxon and Kruskal-Wallis test used for statistical analysis. **Results.** Group A: highly significant difference before and after treatment in both therapeutic subgroups (Wilcoxon test p<0.001), there was no statistical significant difference between therapeutic subgroups (Kruskal-Wallis test, p>0.05). Group B and C: highly significant statistical difference before and after the treatment in two therapeutic subgroups concerning the functional status (Wilcoxon test, p<0.001) laserotherapy subgroup of the Group B and C showed better effects (Kruskal-Wallis test, p<0.05). **Conclusion.** 1. Concerning functional status improving in subacromial bursitis patients, laserotherapy and Diprofos® infiltration are highly effective. There is no significant difference among therapy modalities. 2. In rotator cuff tendinitis and biceps tendinitis, laserotherapy and Diprofos® are highly effective and laserotherapy had better effects. That is why we recommend to use laserotherapy.

Impact of Clostridium Difficile Infection in a Rehabilitation Unit

S. Orini, C. Lecchi, C. Mulè, A. Maestri, N. Astolfi, C. Taveggia

Istituto Clinico Habilita, Sarnico (BG)

Introduction. Clostridium Difficile is the most common source of infectious diarrhea in Rehabilitation Structure: patients have high comorbidity and disability and often previous antibiotics exposition. The objective of this study is describing CD associated diarrhea incidence and prevalence of economic and rehabilitation outcome impact. **Materials and methods.** This is a retrospective study of patient admitted in Rehabilitation Unit of Habilita Sarnico - Bg between January 2009 and December 2009. **Results.** We searched

CD toxin in all patients with diarrhea (34/747) and we found it in 22. At admission 8 came from Internal Medicine, 13 from Surgical Units and only one from home. They presented diarrhea avg 19,5±10 days after admission and before, 20 received antibiotics for different infection (fluorquinolones and betalattams); all received gastric acid lowering medication. Therapy was instituted with vancomycin in 5 patients, metronidazole in 13, either in 4. Only 1 patient had relapse after therapy discontinuation. We determined CDI costs calculating daily cost of pharmacological therapy (vancomycin and metronidazole), nursing care (disposable gowns, shoes, gloves), diarrhea-associated medication costs, biochemistry and additional management as disinfection and patient isolation. Only 9 patients returned home; transfer to other Departments was necessary for the others. **Conclusion.** The CDI is an important problem in Rehabilitation Structure: it slows down objectives achieving, increases cost of management and complications.

References

Christina Marciniak, David Chen, Adam C. Stein et al. Prevalence of Clostridium Difficile Colonization at Admission to Rehabilitation. Arch Phys Med Rehabil Vol 87, August 2006.
 Alison M. Laffan, Michelle F. Bellantoni, William B. Greenough III et al. Burden of Clostridium Difficile-Associated Diarrhea in a Long-Term Care Facility JAGS 54:1068-1073, 2006.
 Erik R. Dubberke; Albert I. Wertheimer, MBA Review of Current Literature on the Economic Burden of Clostridium Difficile Infection, infection control and hospital epidemiology January 2009, vol. 30, no.1.

Disease specific quality of life changes during first year after knee arthroplasty: can WOMAC index detect the difference of two distinct physical therapy programs?

M. Tali¹, J. Maarooos²

¹Department of Sports Medicine and Rehabilitation, Faculty of Medicine, University of Tartu, Estonia

²Sports Medicine and Rehabilitation Clinic of Tartu University Hospital, Estonia

Introduction. Total knee arthroplasty (TKA) is an effective treatment in advanced stage of osteoarthritis which improves quality of life of patients (1). Aim of the study was to follow the course of disease specific quality of life during first postoperative year and specify the ability of Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) to distinguish the effect of two distinct exercise therapy programs in sub-acute phase after surgery.

Materials and methods. Twenty-six female patients having advanced stage of knee osteoarthritis completed WOMAC questionnaire before and three, six, and 12 months after TKA. Three months after arthroplasty patients were randomised in two therapy groups: controlled exercise (under physiotherapist supervision in outpatient rehabilitation setting) group and home exercise group. **Results.** There was significant improvement in all WOMAC index items (0.04<P<0.0001) except for doing heavy domestic duties (P=0.08) during three first months after arthroplasty in entire study group. In controlled exercise group significant change in seven (0.04<P<0.003) and in home exercise group in three (0.04<P<0.006) WOMAC items were followed from three to six months after TKA. There were no significant changes in either group from six to 12 months after TKA.

Conclusion. Most pronounced changes in disease specific quality of life occurred during three first months after TKA (2). Controlled exercise program starting three months after TKA was slightly superior to home exercise group to assure further improvement which could be detected by WOMAC index.

References

1. Núñez M, Lozano L, Núñez E, Segur JM, Sastre S, Maculé F et al 2009. Total knee replacement and health-related quality of life. Arthritis Rheum 61:1062-9.
 2. KAT Trial Group, Johnston L, MacLennan G, McCormack K, Ramsay C, Walker A 2009. The Knee Arthroplasty Trial (KAT) design features, baseline characteristics, and two-year functional outcomes after alternative approaches to knee replacement. J Bone Joint Surg Am 91:134-41.

Brain lesions and spasticity: a voxel-based lesion-symptom mapping analysis on 51 patients.

A. Picelli^{1,2}, F. Gajofatto², S. Tamburini², G. Zanette², V. Varalta^{1,2}, M. Gandolfi^{1,2}, A. Fiaschi, N. Smania^{1,2,3}.

¹Neuromotor and Cognitive Rehabilitation Research Centre, Department of Neurological and Visual Sciences, University of Verona, Italy

²Department of Neurological and Visual Sciences, University of Verona, Italy.

³Rehabilitation Unit, "G.B. Rossi" University Hospital, Verona, Italy

Introduction. Spasticity is a disabling complication of stroke.¹ Aim of this study was to assess the prognostic value of brain lesions location as a predictor of spasticity development after stroke.

Materials and methods. 51 patients (first-ever unilateral ischemic stroke) were recruited. Each patient's T1 magnetic resonance imaging performed 1-4 weeks after the onset was collected. At 6 months after stroke we evaluated the muscle tone at the upper and lower limbs using the Modified Ashworth Scale (MAS).³ Brain lesions were mapped and located using MRIcro and MRIcroN software. For statistical purposes we described spasticity as absent/present. The affected limb was considered spastic if a score ≥ 1 and severely spastic if a score ≥ 3 was present in the MAS at any joint evaluated. **Results.** Brain lesions that showed a significant correlation with the development of spasticity after stroke involved the white matter (corona radiata, internal capsule), the basal ganglia (putamen, caudate, pallidum), the insula, the precentral gyrus, the Rolandic operculum, the frontal gyri, the frontal operculum, the thalamus. Lesions involving the subcortical white matter (corona radiata, internal capsule) and the basal ganglia (putamen, caudate, pallidum) showed a significant correlation with the development of severe spasticity after the onset.

Conclusion. The present study shows that brain lesions' location could be a predictor of the development of spasticity after stroke. In particular lesions involving the corona radiata, the internal capsule and the basal ganglia are related with the development of spasticity and severe spasticity after the onset.

References

1. Sommerfeld DK et al. Spasticity after stroke: its occurrence and association with motor impairments and activity limitations. Stroke. 2004;35:134-139.
 2. Bohannon RW et al. Interrater reliability of a modified Ashworth scale of muscle spasticity. Phys Ther. 1987;67:206-207.
 3. Rorden C et al. Improving lesion-symptom mapping. J. Cogn. Neurosci. 2007;19, 1081-88.

Comparison of The Efficacy of Ultrasound and Laser Treatments in Subacromial Impingement Syndrome

Havva Talay Çalış¹, Nurullah Berberoğlu², Mustafa Çalış²

¹Kayseri Education and Research Hospital, Physical Therapy and Rehabilitation Clinic

²Erciyes University Medical School, Department of Physical and Rehabilitation

Introduction. The aim of this study was to define and compare the efficacy of physical therapy modalities of ultrasound and laser treatments in the treatment of subacromial impingement syndrome.

Materials and methods. This study was performed on 52 subacromial impingement syndrome patients. The patients were randomly allocated in three groups. The patients were treated with; the first group: hotpack+ultrasound+exercise; the second group: hotpack+laser+exercise, and the third group: hotpack+exercise five days a week for three weeks. Range of motion of the patients were measured before and after treatment. Visual analog scale was used to evaluate the severity of pain, Constant scoring was used to evaluate the shoulder functions, the results were compared after the treatment. **Results.** When the results of the groups before treatment were compared with the results after the treatment, there was statistically significant improvement in each of the three groups in both improvement of pain and range of motion and functional improvement of shoulder (p<0,05). However, when the groups were compared with each other, there was no statistically significant difference in the parameters which show improvement (p>0,05). **Conclusion.** In conclusion, the results of this study demonstrated that ultrasound and laser treatments were not superior to each other in the treatment of subacromial impingement syndrome.

Cortical effects of polyneuropathy and potential consequences for conventional rehabilitation

J.W.G. Meijer

Revant Rehabilitation Centers, Rehabilitation Center Breda, Breda, the Netherlands.

Introduction. In polyneuropathy, multiple nerves are involved, mostly by a symmetric distal pattern. Nerve function is disturbed, causing severe impairments and influencing daily activities. In reha-

bilitation, experience-based functional training is performed for these problems. As known, learning and recovery depends on the information provided by sensori-motor efferent-afferent feedback loops. However, in polyneuropathy, nerve dysfunction leads to disturbed feedback loops. This might explain the marginal results of the current rehabilitation programmes. In this study draft we will discuss the knowledge of peripheral and central mechanisms regulating brain plasticity and might prompt newer and more efficacious strategies. **Materials and methods.** Brain plasticity refers to the brain's ability to change its structure and function during learning, environmental challenges or pathology. Learning and functional recovery depends on the information provided by sensori-motor efferent-afferent feedback loops. Due to deafferentation, cortical alterations take place in polyneuropathy, influencing motor programmes and learning. Motor imagery trespasses the inadequate efferent-afferent feedback loops of learning by direct stimulation of the cortex. Motor imagery is the active process to relive sensations with or without external stimuli. Motor recovery and learning are based on response-produced sensory information. By active exercise, a flow of sensory information is created. Numerous studies have indicated that motor imagery result in the same plastic changes on the same areas in the motor system as actual physical practice. **Results.** Will follow. **Conclusion.** In polyneuropathy, nerve dysfunction leads to disturbed feedback loops. Current rehabilitation programmes focus on functional training despite of disturbed feedback loops, with marginal results. Perhaps motor imagery, trespassing the inadequate efferent-afferent feedback loops of learning, might be of value by direct stimulation of the cortex. *An invitation:* We are very interested in your experience and ideas about motor imagery in this patient group and invite you to discuss this during the poster session.

Electrical stimulation after botulinum toxin injection: a comparison between two different protocols. Preliminary results

C. Fontana¹, I. Storti¹, A. Picelli^{1,2}, S. Tamburin¹, D. Munari², M. Gandolfi^{1,2}, A. Zambito³, A. Fiaschi^{2,4}, N. Smania^{1,2,3}

¹Department of Neurological and Visual Sciences, University of Verona, Italy.

²Neuromotor and Cognitive Rehabilitation Research Centre, Department of Neurological and Visual Sciences, University of Verona, Italy.

³Rehabilitation Unit, "G.B. Rossi" University Hospital, Verona, Italy

⁴IRCSS S. Camillo, Venice, Italy

Introduction. Several studies showed that electrical stimulation (ES) of the injected muscles enhances the effectiveness of botulinum toxin type A (BTX-A) in the treatment of spasticity. However there is no agreement about the most effective ES protocol.¹⁻³ Aim of this study was to compare the effectiveness of two ES protocols combined with BTX-A in the treatment of spasticity. **Materials and methods.** 20 patients with spastic arm were evaluated before and 30 days after the BTX-A injection at biceps brachii and abductor digiti minimi (ADM) by means of elbow passive range of movement, Modified Ashworth Scale, Bahktha test and CMAP measured at the ADM. 10 patients (group A) received in the injected muscles a 60 minutes ES immediately after injection. 10 patients (group B) received three daily 30 minutes ES sessions following the injection. **Results.** A significant improvement in the MAS (A: $p=0.003$; B: $p=0.004$) and the ADM CMAP (A: $p=0.005$; B: $p=0.005$). No difference was seen at the between group comparison. **Conclusion.** The present preliminary study was unable to find a difference in terms of effectiveness between the two ES protocols combined with BTX-A injection. Short-term ES seems to be feasible, well tolerate and less expensive.

References

- Frasson E. et al. Nerve stimulation boosts botulinum toxin action in spasticity. *Mov Disord.* 2005;20:624-9.
- Hesse S. et al. Botulinum toxin type A and short-term electrical stimulation in the treatment of upper limb flexor spasticity after stroke: a randomized, double-blind, placebo-controlled trial. *Clin Rehabil.* 1998;12:381-8.
- Bayram S. et al. Low-dose botulinum toxin with short-term electrical stimulation in poststroke spastic drop foot: a preliminary study. *Am J Phys Med Rehabil.* 2006;85:75-81.

The L-acetylcarnitine in peripheral neoneuropathies

M. Megna, S. Altini, G. Ianieri, R. Marvulli, E. Romanelli, M. Ranieri, G. Megna

Neurological and Psychiatric Sciences Department, Physical Medicine and Rehabilitation University of Bari, Italy

Introduction. Carpal Tunnel Syndrome is the most common neuropathy and is due to the compression of the median nerve of the wrist in its passage through the carpal tunnel. The average F: M incidence ratio is 3.8:1. The decade most represented for both sexes is that between 50 and 59 years. In the initial stages of the pathology, Carpal Tunnel Syndrome (CTS) manifests itself with pins and needles, numbness or swelling of the hand, mostly to the first three fingers and partly the fourth finger, above all in the morning and/or during the night. **Materials and methods.** Main purpose of this study is to assess the possible effects of L-acetylcarnitine (LAC) on carpal tunnel syndrome. We select 18 patients with carpal tunnel syndrome demyelinating sensory-motor axons of which 10 women and 8 men with an 'average age between 50±3 years and 68 ± 5 years. All patients were treated with L-acetylcarnitine (ALC). In order to assess the effects of the treatment, all patients were subjected to careful clinical and instrumental evaluation before and after treatment. At baseline and endline we carry out: Clinical test; Pain measurement; Neurophysiological tests. **Results.** Our study shows an improvement of clinical-instrumental parameters analyzed, improvements in electrophysiological factors such as nerve conduction velocities. Patients who had neuropathic pain reported reductions in pain using a visual analog scale. **Conclusion.** Our study shows administration of LAC develops a neuroprotective action through its modulation of the mechanism of production of free radicals. We deduce regular LAC administration can positively modulate subjective and objective symptoms and/or signs of peripheral neuropathies.

References

- Carpal tunnel syndrome and treatment of recurrent symptoms Dahlin LB, Salö M, Thomsen N, Stütz N. *Scand J Plast Reconstr Surg Hand Surg.* 2010 Feb 5
- Transcriptional regulation of type-2 metabotropic glutamate receptors: an epigenetic path to novel treatments for chronic pain. Chiechio S, Copani A, Zammataro M. *Trends Pharmacol Sci.* 2010 Jan 9.
- L-acetylcarnitine: a proposed therapeutic agent for painful peripheral neuropathies Washington University Pain Center and Department of Anesthesiology, Washington University School of Medicine, St. Louis, MO, USA *Curr Neuropharmacol.* 2006 Jul;4(3):233-7.

Case report: Using Botulinum toxin in Von Hippel-Lindau

G. Ianieri, R. Marvulli, S. Altini, G. Tondi, L. Mastromauro, M. Ranieri, G. Megna

Neurological and Psychiatric Sciences Department, Physical Medicine and Rehabilitation University of Bari, Italy

Introduction. Von Hippel-Lindau (VHL) syndrome is a rare hereditary pathology with autosomal dominant transmission that predisposes patients to angiomas and retinal hemangioblastomas onset and to visceral tumors such as cysts and liver, pancreas, adrenals and epididymis neoplasms. **Materials and methods.** 36 years old young man suffering from Von Hippel-Lindau syndrome with D9-D11 spinal hemangioma and with overlying and underlying cystic cavitations (pseudosyringomyelia), operated in March 2007 and arrived in our operative unit at the botulinum toxin clinic for spastic paraparesis with hypertonicity of surae triceps and adductor. The patient also complained of moderate pain as assessed by VAS. The patient underwent psychiatric assessment and functional balance, spasticity assessment by using the Ashworth scale and myometric measurement before and after botulinum toxin infiltration. Was used botulinum toxin type A for all three infiltration cycles. **Results.** Data were analyzed using statistical methods with the paired Student t-test, except where noted, all are expressed as mean and SD. The score on the Ashworth scale increased from 2.75 ± 0.72 to 1.52 ± 0.66; according to myometric assessment, the tone has varied from 16.41 to 14.98, elasticity from 1.12 to 0.98 and stiffness from 308.73 to 265.46 with $p < 0.001$. **Conclusion.** The treatment has promoted: a reduction of muscle tone, an improvement in joint mobility, improvement of gait and stability, with an improvement in postural steps.

References

- Intramedullary tumors. Results of a national investigation in private neurosurgery Adam Y, Benezech J, Blanquet A, et al. *Neurochirurgie.* 2010 Jan 22.
- Disseminated hemangioblastomatosis of the central nervous system without von Hippel-Lindau disease: a case report. Kim HR, Suh YL, Kim JW, Lee JJ. *J Korean Med Sci.* 2009 Aug;24(4):755-9. Epub 2009 Jul 30.
- Spinal cord injuries. Neurological sequelae and complications Levi R, Ahuja S. *Lakartidningen.* 2009 Mar 11-17;106(11):768-71.

Multidisciplinary rehabilitation for Parkinson's disease (PD): a pilot study

S. Cocci Grifoni¹, S. Mori¹, A. Caiazzo¹, M. Capriotti¹, M. Salvi¹, C. Laterza¹, M.A. Vescera¹, S. Cappelletti¹, F. Di Marzio², M. Vallasciani¹, M. Guidi³

¹Istituto di Riabilitazione "S.Stefano" Porto Potenza Picena (MC)

²U.O. di Neurologia, Ospedale "G. Mazzoni" Ascoli Piceno

³U.O. di Neurologia, Ospedale Geriatrico, I.N.R.C.A. Ancona

Introduction. We explored the efficacy of an out-patient setting based on a multidisciplinary rehabilitative program (MRP) for PD patients and their caregivers (CG). **Materials and methods.** We assigned eight PD patients (Hoehn and Yahr stage II-III) to MRP weekly session for six months consisting of TaiChi, Active Music Therapy, and a physiotherapy session. Their CG were assigned to a psychological training. PD patients and CG had meeting with single MRP expert (neurologist, psychologist, speech and language therapist etc.) for educational package. Pre and post evaluation test, were performed: UPDRS (III part), HAD and Beck Scales, PDQ39 and SF36 for PD patients; HAD and Beck Scale, SF36 for CG. **Results.** An analysis of data obtained revealed: 1. Before MRP there were a significant correlation between HAD-Anxiety and Emotional- Well Being ($p < 0.02$) and Stigma ($p < 0.01$) at PDQ39. This correlation wasn't any more detectable after MRP. 2. A significant improvement ($p < 0.05$) at UPDRS and at Stigma and Emotional- Well Being of PDQ39 were seen after MRP. 3. In the CG group there was non change of HAD and SF36 before and after MRP. **Conclusion.** Even if sample size was small, this study seems to suggest that a multidisciplinary approach in PD is more useful than traditional rehabilitation (2) for quality life and UPDRS.

References

1. Deane KHO et al. Physiotherapy versus placebo or no intervention in Parkinson's disease (Cochrane review). In: the Cochrane library, issue 2. Oxford: update Software, 2002.
2. DT Wade et al. Multidisciplinary rehabilitation for people with Parkinson's disease: a randomised controlled study. *J Neurol Neurosurg Psychiatry* 2003; 74: 158-62.

Respiratory failure in ALS patients. Ethical counselling in clinical choices: the experience in a rehabilitation unit

M. Bertini, K. Bernasconi, S.G. Colombo, E. Gandolfi, L. Gazzani, F. Zaro
Department of Rehabilitation, S. Anthony Hospital, Gallarate (Milan), Italy

Introduction. The course of amyotrophic lateral sclerosis (ALS) confronts the patient, the family and the clinical team with many ethical issues and challenges. Decisions about artificial invasive ventilation are crucial and difficult. Ethical counselling represent a professional help for the patient and the family in the choice tracheostomy versus non invasive ventilation with palliative care support. **Materials and methods.** We considered ALS patients admitted in our Rehabilitation unit in the last three years, after first communication of neurological diagnosis. We analyzed the group of patient already arrived at life-threatening bulbar and respiratory muscle dysfunction in this period. They had a specific and personalized communication program in the rehabilitative-palliative project. Ethical communication in our department includes counselling sessions with rehabilitation physicians, nurses and technicians with experience in ALS patients' care, cognitive function evaluation, opportunity of psychological support, spiritual and pastoral care, team sessions dedicated to single patient. It's possible to meet patient also at home and in the emergency department. **Results.** In the last 3 years (2007-2009) we admitted in hospital 75 ALS patients, some of them had two or three hospitals admissions (totally 103 admissions). Patients who already reached severe bulbar and respiratory dysfunction: 24/75. Patients treated with tracheostomy: 11. Patients who refused tracheostomy and died with palliative care support: 10. Sudden death: 3. No euthanasia or invasive ventilation interruption requests. **Conclusion.** We tried to improve management of difficult choices in the clinical pathways of ALS patients empowering communication skills and ethical education of the rehabilitation team. It is important for better communicate the significance of life-threatening symptoms, monitor capacity for patient decision making, anticipate and manage multiple clinical scenarios and accompany patients in crucial decisions about their lives.

References

1. Hastings Center Report, Improving End of Life Care, 2003.

Is Vitamin D a determinant of muscle mass and strength?

I. Marantes, E.J. Atkinson, S.J. Achenbach, S. Khosla, L.J. Melton, III, Shreyasee Amin.

Hospital Pedro Hispano, Portugal; Mayo Clinic, Rochester, USA

Introduction. Although the effects of vitamin D on bone metabolism are well known, there remains a lack of consensus on the association between vitamin D levels and muscle mass and strength. Therefore, the aim of this study was to investigate the association between serum 25-hydroxyvitamin D and 1,25-dihydroxyvitamin D levels and skeletal muscle mass and strength in a population based, age-stratified sample of adult men and women. **Materials and methods.** In this cross-sectional study, we recruited subjects from an age-stratified, random sample of Rochester residents who were selected using the medical records linkage of the Rochester Epidemiology Project. Total lean body mass and total fat mass were determined using a whole body dual-energy x-ray absorptiometry scan. Muscle strength was determined using handgrip force and isometric knee extension torque. Multivariate linear regression models were developed to calculate the least-squares (LS) means of muscle mass and strength measures by 25(OH)D and 1,25(OH)D2 quartiles and where we adjusted for age, height, physical activity, fat mass and season. **Results.** Our final study sample included 311 men (mean age, 56 yrs; range, 22.7-91 yrs) and 356 women (mean age, 57 yrs; range, 21-97 yrs). In the multivariate analysis we found no association between 25(OH)D or 1,25(OH)D2 and any of the measurements of muscle mass or skeletal muscle strength. Moreover, using lowess regression plots to assess for possible cutoffs different from those of the 25(OH)D and 1,25(OH)D2 quartiles, we still did not find any threshold levels for vitamin D that could be associated with low muscle mass or strength. **Conclusion.** In this population based sample of young and older adults, we found no association between vitamin D with either muscle mass or strength. The association between vitamin D and falls observed in some studies may be due to other factors that also affect neuromuscular function.

References

1. Holick MF. Vitamin D deficiency. *N Engl J Med*, 2007. 357(3): p. 266-81.
2. Bischoff-Ferrari HA, et al. Higher 25-hydroxyvitamin D concentrations are associated with better lower-extremity function in both active and inactive persons aged > 60 y. *Am J Clin Nutr*, 2004. 80(3): p. 752-8.
3. Bischoff HA, et al. In situ detection of 1,25-dihydroxyvitamin D3 receptor in human skeletal muscle tissue. *Histochem J*, 2001. 33(1): p. 19-24.
4. Bischoff HA et al. Effect of Vitamin D on falls: a meta-analysis. *JAMA*. 2004. 291(16):1999-2006

Integration of exercise and cognitive-behavioural interventions to increase physical activity among adults with chronic diseases

W. Geidl, J. Hofmann, K. Pfeifer

Institute of Sport Science and Sport, Friedrich-Alexander University Erlangen-Nuremberg, Germany

Introduction. Exercise therapy is a cornerstone for the rehabilitation of chronic diseases. The widespread health benefits of structured, repetitive and regular physical activity (PA) are well known. The persistent increase of PA turns out to be a major goal of rehabilitation. Frequently, exercise interventions fail in changing the PA of patients in the long-run. Most adults with chronic diseases drop back into a sedentary lifestyle after completing exercise-based rehabilitation. The purpose of this work is the evidence-based conceptualization of an intervention that integrates exercise and cognitive-behavioural interventions to initiate long lasting changes in PA. **Materials and methods.** We used systematic hierarchic review methods to identify potential scientific reports, determine the eligibility, synthesize results and interpret findings in a narrative way. We conducted searches in MEDLINE, Scopus and PsycINFO until December 2008. In a first step preliminary systematic works e.g. guidelines, reviews and meta-analyses were evaluated. Analysis of primary studies was limited to topics where no reviews or meta-analysis were available. English- and German-language reports of interventions for adults with chronic diseases were eligible for inclusion. **Results.** A combination of the following behavioural interventions is effective to enhance PA: self-monitoring, goal-setting, contracting, feedback, stimulus control, promotion of positive outcome expectancies and accentuation of positive consequences of PA. Additional cognitive interventions increase the adherence to exercise: barriers management, offering exercise-related knowledge and individual exercise prescription, individual cost-benefit analysis for

PA. Effective exercise interventions introduce different kinds of exercise, tailor modalities and intensities of exercise according to individual requirements and strengthen exercise-related self-efficacy through skills mastery. **Conclusion.** To initiate long lasting changes in PA of persons with chronic diseases the combination of cognitive and behavioural interventions in tailored exercise programs is effective. Evidence-based rehabilitation needs concepts which integrate patient education, behavioural interventions and exercise.

Radial Extracorporeal Shock-wave Therapy in Rotator Cuff Calcific Tendinosis

A. Veliaj¹, G. Mangone¹, M. Postiglione², P. Pasquetti¹

¹Recovery and Rehabilitation Agency, University Hospital of Careggi, Florence, Italy.

²Postgraduate Specialization School in Physical and Rehabilitation Medicine, Faculty of Medicine, University of Florence, Italy

Introduction. The objective of the study is to evaluate the effectiveness of Radial Extracorporeal Shock-wave Therapy (RESWT) compare with High Intensity LASER Therapy (HILT) for the treatment of patients with Rotator Cuff Calcific Tendinosis (RCCT). RCCT is widely diffused, it is painful and invalidating. It is an important public health problem with social and economic implications. The most common therapeutic approach is a physiotherapeutic one. Both HILT and ESWT give positive results. The is a debate on which is to be preferred. Therefore there is need to obtain scientific evidence to support either case. **Materials and methods.** An observational study was carried out in the period between 2008 and September 2009 in our outpatient clinic with 62 patients, divided into 3 groups: group A 36 patients treated only with RESWT, group B 26 patients treated only with HILT and group C 16 patients with only short term improvement with HILT retreated with RESWT. Patients were evaluated with Constant-Murley scale before and after treatment (immediately, 1 month and 3 months) for mean constant score, pain and range of movement. Data were examined statistically with SPSS. Criteria for inclusion and exclusion were defined. **Results.** Patients treated with HILT have shown good clinical results but have returned to original syndrome 1 month after treatment. RESWT has given improvement after treatment extended in time (3 months) in terms of pain and recover of functionality with a limited number of applications. **Conclusion.** The evidence collected indicates that RESWT is the method of choice.

References

Robertson VJ, Baker KG. A review of therapeutic ultrasound: effectiveness studies, *Phys. Ther.*, 2001;81(7):1339-50.
Gerdesmeyer L, Wagenpfeil S, Haake M, Maier M, Loew M. et al. "Extracorporeal shock wave therapy for the treatment of chronic calcifying tendonitis of the rotator cuff: a randomized controlled trial", *JAMA*, 2003; 290(19):2573-80.

A new iPhone-based goniometer (DrGoniometer): a validation study

G. Ferriero¹, S. Vercelli¹, F. Sartorio¹, E. Brigatti², C. Ruella³, D. Primavera⁴

¹Unit of Occupational Rehabilitation and Ergonomics, Fondazione Salvatore Maugeri, Clinica del Lavoro e della Riabilitazione, IRCCS, Scientific Institute of Veruno (NO), Italy.

²Department of Physical Medicine and Rehabilitation, University of Pavia, Italy.

³School of Physiotherapy at University of Piemonte Orientale "A. Avogadro", Novara, Italy.

⁴School of Occupational Therapy at Università Cattolica del Sacro Cuore, Moncrivello (VC), Italy.

Introduction. In rehabilitation there is a growing need to have an objective report of every clinical measurement. To date, in clinical settings ROM is measured using a universal goniometer, and values are then recorded. A new goniometer working on iPhone, called DrGoniometer, has recently been developed to measure the angular value of joints. The measurement is made by placing a virtual goniometer on a photo of the limb. It is thereby possible to print a complete report and store the data for future comparisons. The aim of this work is to assess the validity and reliability of this device in measuring knee ROM. **Materials and methods.** Subjects were placed on an isokinetic device to fix the leg and obtain the knee's goniometric measure. Four raters (2 experts) each took 25 photos of subject's knee at 2 flexion angles (20°,80°) to assess response stability (mean, SD), and 3 additional series of 10 photos at

3 other angles (35°,45°,60°) to check for agreement with the isokinetic device ($\pm 5^\circ$), and intrarater and interrater correlation (ICC) for total, inexperienced and expert raters. Raters were blinded as regards all values. **Results.** Mean and SD values at 20° were 22.6° and 3.3°, and at 80° were 76.9° and 2.0°. All raters' and expert raters' agreement was respectively 76.5% and 95%. Intra-rater and inter-rater correlation were high (all values >.987). **Conclusion.** In this experimental setting DrGoniometer, an iPhone application, showed to be valid and reliable, particularly as regards expert raters. Further studies are needed to assess the use of this simple handheld device in clinical practice.

References

Watkins MA, et al. Reliability of goniometric measurements and visual estimates of knee range of motion obtained in a clinical setting. *Phys Ther* 1991;71:90-6.

Bennet D, et al. Measurement of knee joint motion using digital imaging. *Int Orthop* 2009;33:1627-31.

Nutritional status in a neurorehabilitation unit: relationship to functional capacity

G. Bovio¹, D. Bossi², E. Carlisi², L. Ciuffreda², I. Degli Agosti², I. Fontana¹, A. Landi¹, A. Magistri², M. Viggiano², A. Zaliani²

¹Metabolic-Nutritional Unit and Palliative Care Unit,

²Department of Neurorehabilitation. Salvatore Maugeri Foundation, IRCCS, Rehabilitation Institute of Pavia, Pavia, Italy.

Introduction. The nutritional status could influence the functional capacity of the individual. We assessed the prevalence of malnutrition and the relationship between nutritional status and functional capacity among hospitalized patients in a Neurorehabilitation Unit. **Materials and methods.** We studied 90 consecutive patients (54 F, 46 M, mean age 63.8 \pm 15 years, mean body mass index (BMI) 25.76 \pm 6.2 Kg/m²). The nutritional status was assessed at hospital admission with the weight loss percentage over the usual body weight, the anthropometric measurements and serum albumin, prealbumin and transferrin. Patients were classified as well-nourished or malnourished. The functional capacity was determined with the Functional Independence Measure (FIM) scale at admission and at the discharge. **Results.** 31% (28 patients) were classified as malnourished whereas 69% (62 patients) as well-nourished. Malnourished had a significantly lower BMI than well-nourished patients (23.43 \pm 4.5 vs 26.81 \pm 6.6 kg/m². p = 0.016). At hospital admission malnourished had significantly lower total FIM score (68.7 \pm 18 vs 89.6 \pm 18. p < 0.001), cognitive FIM score (29.5 \pm 7 vs 32.8 \pm 5. p = 0.015) and motor FIM score (39.2 \pm 5 vs 56.8 \pm 15. p < 0.001) than well-nourished patients. At hospital discharge the malnourished patients had a total FIM score (90.6 \pm 23 vs 105.6 \pm 15. p=0.001) and the motor FIM score (59.6 \pm 21 vs 72.5 \pm 12. p < 0.001) still significantly lower than well-nourished patients; the difference in cognitive FIM score between the two groups was marginally significant (31 \pm 7 vs 33.2 \pm 5. p = 0.08). **Conclusion.** There is a high prevalence of malnutrition in hospitalized patients in Neurorehabilitation setting. Malnourished had a reduced functional capacity compared with well-nourished patients both at admission and at hospital discharge. The nutritional assessment and the malnutrition correction had a pivotal role in improving the functional capacity in these patients.

The role of isokinetic testing into the evaluation of shoulder strength post-mastectomy.

A. Russo, M. Delli Bergoli, M.P. Lo Muzio, L. Amoroso, M.A. Mimmo, V. Simone, S. Filoni, V. Rastelli, G. Cassatella, A. Santamato, P. Fiore
Cattedra e unità operativa di Medicina Fisica e Riabilitazione
Universitaria-Ospedali Riuniti di Foggia

Introduction. Objective of this study was to determine the role of a 6 month exercise training on evaluation of shoulder strength in self-care post mastectomy women. **Materials and methods.** Forty women (mean age 45-75 years) submitted to radical mastectomy and breast reconstruction were studied. 20 patients (group A) were randomly assigned to a 6-month (3/week) rehabilitation program consisting of functional compression, manual drainage and slow exercise in the same arm of breast surgery. The other 20 patients (group B) were treated with manual arm drainage and trained with home exercise rehabilitation program. They were used as control. All patients were tested with isokinetic machine at baseline and every one month until the end of the study. The patients with strong arm lymphatic oedema, impingement syndrome and depression were

excluded. Clinical parameters were checked at baseline and every one month until the end of the study. Every day we measured range of motion (ROM) of treated arm. Physical function (Function independence measure) and quality of life (Barthel Index) were determined at baseline and at the end of the rehabilitation program. We valued pain (VAS) and shoulder disability (Constant Murley) before and after treatment. **Results.** The observed differences in ROM and strength were significant for flexion and abduction in patients processed to combined treatment. Statistically significant differences were revealed in the group of 40 patients between the dominant versus non dominant side of the body. **Conclusion.** Extended exercise training significantly increases the quality of life and shoulder strength in women treated for breast cancer.

References

Roi GS. L'esercizio isocinetico, ed. Alea, Milano, 1998.

The effect of in-patient rehabilitation on physical capacity in early period following acute myocardial infarction

D. Jurgelevičienė³, A. Ramonas¹, A. Rudys⁴, N. Bičkauskaitė², A. Juocevičius⁵

¹Vilnius University, Faculty of Medicine, Institute of Rehabilitation, Sports Medicine and Nursing

²Vilnius University hospital "Santariškių klinikos", Clinic of Heart and Vascular Medicine

³Vilnius University, Faculty of Medicine, Institute of Rehabilitation, Sports Medicine and Nursing

⁴Vilnius University, Faculty of Medicine, Clinic of Heart and Vascular Medicine

⁵Vilnius University, Faculty of Medicine, Institute of Rehabilitation, Sports Medicine and Nursing

Introduction. Early exercise training following acute coronary events relieve symptoms of cardiac failure, improve quality of life and physical fitness (VO₂max). The main aim of this study was to evaluate and quantify the effect of exercise training in early rehabilitation period following acute myocardial infarction in patients with improved coronary perfusion and low LVEF (left ventricle ejection fraction). **Materials and methods.** 30 patients were included in the study. All of them underwent 3 weeks inpatient rehabilitation which was introduced approximately 10 days since a very beginning of myocardial infarction. Physical training program consisted of supervised aerobic training (cycling, walking) at intensities corresponding 50 – 60 % peak oxygen consumption. We compare patient physical capacity (VO₂peak, exercise capacity (W)), as well patient functional classes NYHA and myocardial reserve (double multiply) changes at the beginning (week I) and the end of rehabilitation period (week III). **Results.** After 3 weeks period of rehabilitation peak oxygen consumption (VO₂peak) increased from 1,647±0,601 l/min to 1,889 ± 0,772 l/min (P < 0,05); patients tolerated a higher exercise load (from 119±36 W to 137±45 W, P < 0,05). In addition, there was an improved exercise capacity (W) at individual Wasserman's anaerobic threshold (from 89 ± 36 W to 101 ± 36 W, P < 0,01). Whereas myocardial reserve changes during rehabilitation showed to be statistically not significant (from 2,55 ± 0,47 to 2,92 ± 0,95, P = 0,06). **Conclusion.** Individual exercise training in early rehabilitation period significantly improves physical and exercise capacity in patients with improved coronary perfusion and low LVEF following acute myocardial infarction. In our study it was demonstrated by observed significant changes in peak oxygen consumption (VO₂peak) and exercise load (W) tolerance at individual Wasserman's aerobic threshold point.

Is it possible a tourism for the severe neurological disabled people?

M. Di Stefano

SIMFER Lombardia

Introduction. To get possible an inclusive tourism in the severe neurological disabled people it is not enough to look for the accessibility of the hotels and the ways, but it is necessary to think about a different territorial strategy, different planning of the cities and about the organization of the local tourism. The analysis of the needs and the expectations of the severe neurological disabled subjects and their caregivers shows the absence of a reliable, fulfilled information of the accessibility of the countries and the tourism sites. The accessibility

represents a fundamental rights highlighted from the UN Convention on the Disabled People Rights. In the following case report we checked the main needs for the disabled travelling people. **Materials and methods.** We analyzed the needs of 3 males, 20, 40, 65 years old, with severe neurological disability starting a travel. **Results.** In spite of the help to find the suitable solution for their needs, all the subjects highlighted the discriminative attitude founded in the majority of the tourist location: this is the reason of the travelling renunciation in 2 subjects. Ethics is the fundamental issue to start with the inclusive tourism. **Conclusion.** In rehabilitation it's not forgetting that tourism is an important mean to accomplish the rehabilitative course of the neurological disabled patient and that the Activity and Participation components of the ICF are fundamental and often are the keystones to achieve higher goals, overcoming physical limitations.

References

Fantini L., Matteucci M.E. Guida al turismo accessibile, Ed.Airplane, Bologna, 2003

Organizzazione Mondiale della Sanità, ICF Classificazione Internazionale del Funzionamento, della Disabilità e della salute. Ed.Erickson, Trento, 2002.

Ministero del Lavoro, della Salute e delle Politiche Sociali. La Convenzione ONU delle Nazioni Unite sui diritti delle persone con disabilità, Roma 2009.

Efficacy of intensive rehabilitative hospitalization in patients with traumatic and non-traumatic severe brain injury

D. Drigo¹, V. Casasola², C. Olivo², F.E. Pisa¹, E. Biasutti², T. Giorgini², L. Monti Bragadin², A. Voltaza², P. Di Benedetto²

¹Institute of Hygiene, School of Medicine and University Hospital of Udine (Udine, Italy)

²Physical Medicine and Rehabilitation Institute (IMFR) of Udine (Udine, Italy)

Introduction. The aim is to compare the efficacy of post-acute intensive rehabilitation, and its relation with days of hospitalization (DHs), between severe brain injury traumatic (SBI-T) and non traumatic (SBI-NT). **Materials and methods.** A 7 years retrospective cohort study was conducted on all the 167 patients admitted for intensive rehabilitation to the Physical Medicine and Rehabilitation Institute (IMFR) of Udine from 2003 to 2009. Information on cause, dates of birth, admission and discharge, FIM and BI scores was abstracted from the medical charts. Differences between FIM (dFIM) and BI (dBI) scores at discharge and admission were used as efficacy indicators. Wilcoxon rank sum test was used to compare patient's age, dFIM and dBI between subjects with SBI-T vs SBI-NT. The relation between dFIM / dBI and DHs was evaluated by simple linear regression. **Results.** Information for FIM was found in 95 patients (57%) and for BI in 135 (81%). The difference in dBI between SBI-T (median= 15, 25°pct= 0, 75°pct= 35) and SBI-NT (median= 0, 25°pct= 0, 75°pct= 25) was significant (p= 0,038), but non significant for dFIM (traumatic: median= 18, 25°pct= 6, 75°pct= 48; non traumatic: median= 19, 25°pct= 6, 75°pct= 39) (p= 0,47). SBI-T (age median= 45 yrs, 25°pct= 30, 75°pct= 62) were significantly younger than SBI-NT (median= 55, 25°pct= 47, 75°pct= 67) (p= 0,001). DHs only in SBI-NT were significantly related to the decrease in FIM (beta= -0.7, p=0.0239), but explained 18,1% of the variation (R²=0.1812). **Conclusion.** The increase in BI is significantly greater in patients with SBI-T than in SBI-NT. The non significance in FIM may depend on the smaller sample size due to missing data. Length of hospitalization seems not to be a predictor of improvement, though the effect of age and severity of conditions should be further investigated.

References

L. Tesio et al "Sistemi classificativi dei pazienti in degenza riabilitativa". Fondazione Salvatore Maugeri, IRCCS, Pavia, 1996. I Documenti vol. 7: 87-102.

The most proper garment in every patient

S. Michelinì, G. Moneta, A. Failla, M. Cardone, A. Fiorentino, F. Cappellino

S. Giovanni Battista Hospital, Rome, Italy

Introduction. The reduction of lymphedema after a physical combined decongestive treatment (CPDT) is the result of a work performed on the holistic vision of the problem (stage, muscles, articulations, skin), psychological and social conditions (age, job, family). All these aspects and the obtained results lead us toward the choice of the most proper garment for each patient in order to be sure that,

first of all, the garment will be worn always and in any case with the highest possible compliance. **Materials and methods.** In the last 2 years we have treated 283 patients for a lymphedema of the limbs. Among them 182 were female and 101 male and the age range was between 2 and 88 years old. All the patients were approached basing on a previous or not experience of PCDT, in order to administer, in the most correct way, the treatments (above all bandages) to avoid from the beginning, bad responses as regard the compliance. **Results.** All the patients, at the end of cycle, worn the garment considered as the most proper to be constantly used, but 34 of them (21 female , 13 male) at the control declared to wear ever or rarely the garment for different matters (social, climate, psychological aspects, concomitant occurred pathologies). In 107 cases was necessary a "made by measure" also, sometimes, with additional. For all the other patients a prescription of a standard garment was enough to guarantee the results gave by the CPDT. **Conclusion.** It's necessary to know who and why will wear the garment for the prescription. Only in this way It's possible to obtain best patient compliance.

References

ISL: The diagnosis and treatment of peripheral lymphedema. Consensus document of International Society of Lymphology. *Lymphology*, 2002; 28: 113-117.

ICF functioning core sets in lymphedema secondary to breast cancer

S. Michelini, M. Cardone, F. Cappellino, A. Fiorentino, A. Failla, G. Moneta, L. Michelotti
San Giovanni Battista Hospital – Rome Italy

Introduction. Aim of the work was to find a checklist of items to be used in the "d" domain of ICF, analyzing the specific level of functioning, in order to obtain a faster use and to facilitate the gathering of statistical data. Second, profit was the finding of a correlation between the degree of oedema and the health of patients, in order to provide a useful tool for objectifying the degree of disability that follows a certain stage. **Materials and methods.** Since no systematic work has been established in individualizing limitations in functioning and health in 125 secondary lymphedema-related patient, we tried to define a typical spectrum of problems in functioning in patients with lymphedema secondary to breast cancer, with 14 specific items. The study of functioning in such patients could help us to comprehend better the health status. **Results.** The results show that with increasing oedema there is an exponential decline in health status of the patient, otherwise difficult to objectify through the disability scales commonly used in clinical practice, with the advantage of being able to use a universal language with a multi-professional access. **Conclusion.** Further studies could consider subset of patients, for example breast-conserving treatment, mastectomy, radiation therapy, patient age, etc., in order to demonstrate differences in health condition and functioning in between these categories helping us in planning health interventions and resources, through a multidisciplinary assessment that can help communication and information process among patients, relatives, and healthcare professionals in the understanding functioning problems.

References

1. M. Ricci: Proposal of Disability Scale for Lymphoedema. *Eur J Lymphol vol XIX, n° 55, 2008.*
2. World Health Organization: International Classification of Functioning, Disability and Health: Geneva, WHO 2001

Treatment by neuroelectrostimulation (FREMS) of the artheriopathy of lower limb: preliminary study

S. Michelini, M. Cardone, L. Michelotti, G. Moneta, A. Fiorentino, F. Cappellino
San Giovanni battista Hospital, ACISMOM, Rome, Italy

Introduction. The FREMS system is based on a trans-cutaneous neuro stimulation characterized by electric impulse sequences variable in frequency and duration with schemes set in advance. It carries on a direct action on the vessel's smooth muscle relating on the effects of synchronous depolarization, vaso-motion and regulation of growth factors (VEGF). **Materials and methods.** We studied 24 patient (16 males and 8 females) with artheriopathy at II clinical stage. All the patients were subjected to valuation of the treadmill test and laser doppler at beginning and at the end of the rehabilitative treatment (10 therapy sessions). 12 patients (Group A) were

subjected to physical treatment (tissue massage and kinesitherapy); 12 patients (Group B) were subjected, as well as the cycle described, even by FREMS stimulation (40 minutes/session with varying intensity between 150 and 200 Volts). **Results.** At the end of the treatment we observed: Group A: Average increase of treadmill test 142%; increase laserdoppler flow 37%; Group B: Average increase of treadmill test 175%; increase laserdoppler flow 55%. **Conclusion.** The preliminary study demonstrates the validity of neuro-electrostimulation on the artheriopathic patient, associated with regular sessions of physical training. The ease of use, the lack of traumaticity and low costs suggest a larger use of the technique in the management of chronic artheriopathic patient

References

R. Da Ros, C. Vitale, R. Assaloni, A. Ceriello: Applicazione della Neuromodulazione FREMS nei pazienti con arteriopatía periferica SID Torino Maggio 2006.

Influence of a preoperative rehabilitation program on hip arthroplasty outcome. Preliminary results

A. Zancan, C. Villani, D. Sparpaglione, B. Bigatti, G. Lorber, G. Bronzini, B. Crosignani
Fondazione Salvatore Maugeri, Unità Operativa di Recupero e Rieducazione Funzionale, Scientific Institute of Pavia

Introduction. From literature there is insufficient evidence about the efficacy of a preoperative education on patient's outcome^{1,2} after hip surgery. Aim of this study was to test the feasibility and efficacy of a short (two weeks), preoperative physiotherapy on patient's outcome. **Materials and methods.** The study has been designed as clinical trial. Two groups of 10 randomized subjects have been studied, having the same characteristics (age, pathology, pathology onset, type of surgery). One group (G1) has been treated by preoperative physiotherapy, one group (G2) has not been treated before surgery. Both groups underwent multiple evaluations (preoperative, on admittance and on discharge from hospital) regarding hip range of movement (ROM), muscle strength, pain level (VAS) , function and impairment (MAYO and FIM scale), raising and walking ability (Timed get up and go and Walking test) and length of stay in the hospital. **Results.** On Hospital admittance, G1 has shown a better hip ROM and a lower VAS score than G2. On discharge G1 has shown an increased step length, a lower step width, a better Timed Get Up and Go test and FIM score and a shorter length of stay. **Conclusion.** A short term preoperative physiotherapy feasibility has been tested and found possible, recording a better patient's compliance to postoperative physiotherapy due to a better hip ROM and a lower pain level, resulting in improved patient's gait parameters and overall outcome, with a shorter length of stay in the hospital.

References

1. Amabile E, et al. Effect of Pre-Operative Physiotherapy in Patients With End-Stage Osteoarthritis Undergoing Hip Arthroplasty. *Clinical Rehabilitation*, Vol. 22, 977-986, 2008
2. Alpert S, et al. Effect of Preoperative Exercise on Measures of Functional Status in Men and Women Undergoing Total Hip and Knee Arthroplasty. *Vol. 55, No. 5, October 15 2006*

Effectiveness of urinary rehabilitation in ms patients

M.L. Lopes de Carvalho, G. Bricchetto, R. Motta, M. Causa
Italian MS Society Rehabilitation Centre, Genoa-Italy

Introduction. Over 80% of Multiple Sclerosis (MS) patients have symptoms of lower urinary dysfunction[1] during the disease course. Urinary dysfunction can have a significant impact on patient quality of life. Comprehensive evaluation is essential for MS specialists to effectively manage these potentially life-disrupting symptoms[2]. This study evaluated the effectiveness of a rehabilitation programme for MS patients with urinary dysfunction being followed in a specialized rehabilitation centre. **Materials and methods.** 62 MS patients with urinary symptoms were enrolled in the study. Data collected at pre-treatment- T0 included: age, EDSS, course and duration of disease, mobility status, urinary symptoms, Post Void Residual (PVR) with bladder ultrasound, Wagner Test, Visual Analogue Scale (VAS), urodynamic investigation, pelvic floor muscle evaluation (Pubo – Coccygeal Grading Test and muscle coordination evaluation). Patients also completed a 5-day bladder diary. An individualised urinary rehabilitation programme was developed. At the end of the rehabilitation programme -T1- (mean duration:12 sessions) all patients repeated the same evaluation as was conducted at T0

without the uro-dynamic investigation. Primary outcomes include urinary incontinence (Wagner Test), mean number of episodes of leakage (bladder diary), mean number of episodes of urinary frequency in 5 days (bladder diary) and mean number of nocturia and urgency, and urinary retention (PVR). Secondary outcomes include changes in VAS and Pubo – Coccygeal Grading Test. **Results.** Out of 62 subjects enrolled in the study, 54 were female and 8 were male. Mean age was 52,67±13,14 years. Mean disease onset was 13,78 ± 9,38 years. Mean EDSS was 5,39±1,39. Data shows a mean Wagner Test at T1 of 67,77 and at T1 of 75,95; mean PVR at T0 of 113,39ml and at T1 of 97,93ml with a statistically significant difference (p=0,010). Visual Analogue Scale (VAS) was at T0: 60,05mm and at T1: 53,35mm with a statistically significant difference (p<0,001). Pubo-Coccygeal Grading Tests for muscle strength, resistance and endurance were statistically significant before (T0) and after treatment (T1) with p < 0,001. **Conclusion.** Statistical analysis showed that primary and secondary outcomes are statistically significant. Urinary rehabilitation seems to be effective in MS subjects if performed in a specialized rehabilitation centre.

References

- de Seze, M., et al., The neurogenic bladder in multiple sclerosis: review of the literature and proposal of management guidelines. *Mult Scler*, 2007. 13(7): p. 915-28.
- Andrews, K.L. and D.A. Husmann, Bladder dysfunction and management in multiple sclerosis. *Mayo Clin Proc*, 1997. 72(12): p. 1176-83.

Influence of mineral sulfide bath on peripheral arterial disease

Zaklina Damnjanovic, Rade Kostic, Dragica Rondovic
Special hospital for rehabilitation "Gamzigrad" Gamzigrad Spa

Introduction. PAD patients have decreased functional status lower extremity than non-PAD persons¹. The aim: To show the effect of mineral sulfide bath and vacusac treatment (intermittent suction and pressure), on patients with peripheral arterial disease (PAD) **Materials and methods.** Design: single-factor comparative .This prospective clinical research included 40 patients , with ASPI (Ankle Systolic Pressure Index) less then 0,90. Patients are divided, by random sample methods, in two groups. First group was treated only with vacusac therapy, once a day, during 15 days and second group, together with vacuum therapy, was treated with mineral sulfide bath .(t = 20 min; T = 37°C). Before the start and after the end of the treatment mesurments of ASPI and claudicational interval (CI) on treadmill tape at the speed of 3,6 km/h. **Results.** All results are processed with T-test and there was statistically significant difference in mesurments before and after the treatment within the groups. There is also statistically significant difference in mesurments of CI of the second group, considering the results or the first group (t = -2,26 ; p< 0,05). **Conclusion.** Vacuum therapy is efficient in treatment PAD, but the effect is bigger if it is used in two component physical treatment together with mineral sulfide bath^{2,3}.

References

- Stein R, Hriljac I, Halperin JL.: Limitation of the resting ankle-brachial index in symptomatic patients with peripheral arterial disease. *Vasc Med*. 2006 Feb;11(1):29-33.
- Bender T, Karagulle Z.: Hydrotherapy, balneotherapy, and spa treatment in pain management. *Rheumatol Int*. 2005 Apr;25(3):220-4.
- Chaban VT, Odnolko AN. Sulfide balneotherapy combined with local hyperbaric oxygenation in arteriosclerosis obliterans of the lower extremities. *Voen Med Zh* 2007 Jul;55-56.

A randomized, double-blind, placebo-controlled crossover study using a low frequency magnetic field in the treatment of fatigue in Multiple Sclerosis

M.L. Lopes de Carvalho, R. Motta, G. Konrad, G. Bricchetto, M.A. Battaglia.
Italian Multiple Sclerosis Society, Rehabilitation Centre, Genova - Italy

Introduction. One of the symptoms causing the greatest morbidity and disability in multiple sclerosis (MS) is fatigue(1). The aim of this randomized, double-blind, placebo-controlled crossover study was to assess whether a low frequency magnetic field can reduce fatigue in MS subjects. **Material and methods.** Forty-two subjects were recruited among those followed as outpatients at AISM rehabilitation centre. Inclusion criteria were: stable phase of the disease, ambulatory subjects with EDSS < 7; exclusion criteria: secondary

causes of fatigue. Subjects were randomized into two groups: Biorm group (21 subjects) and placebo group – sham therapy (21 subjects). Subjects were evaluated with Time Walking test, Visual Analog Test, Modified Fatigue Impact Scale (MFIS) and Fatigue Severity Scale (FSS) at T0 (begin of Biorm Therapy or sham therapy), T1 (end of Biorm Therapy or sham therapy), T2 (begin of Biorm Therapy or sham therapy) and T3 ((end of Biorm Therapy or sham therapy). Each group received both sham therapy and Biorm therapy with a wash out period of 4 months (T1 – T2). Subjects were treated for 24 minutes/session three times/week for 8 weeks. Statistical analysis was performed using a multivariate analysis taking into account TIME (T0, T1, T2 and T3) and TREATMENT (Biorm or sham) as fixed factor; TWT, VAS, MFIS and FSS were considered as dependent factors. **Results.** Results showed an statistically significant improvement in MFIS (p < 0,05) for both groups, although no statistically significant differences were found taking into consideration TREATMENT factor. **Conclusion.** Low frequency magnetic field exposure has no advantage over sham exposure in reducing impact of fatigue in Multiple Sclerosis Subjects.

References

- Freal JE, Kraft GH, Coryell JK: Symptomatic fatigue in multiple sclerosis. *Arch Phys Med Rehabil* 1984, 65(3):135-138.

Effectiveness of balance disorders rehabilitation treatments in multiple sclerosis subjects: a pilot randomized control trial assessing the wii balance board gaming system

G. Bricchetto, P. Spallarossa; M.L. Lopes
Italian Multiple Sclerosis Society, Rehabilitation Centre, Genova Italy

Introduction. Balance disorders are frequently observed in subjects with multiple sclerosis (MS) (1) leading to impaired balance and increased risk of falls. New rehabilitation approaches are crucial in order to improve the efficacy of interventions and to stimulate subjects' attention during the rehabilitation treatment. **Materials and methods.** Thirty-six MS patients were selected among those followed as outpatients at AISM Rehabilitation Centre and randomized into two groups: Wii Balance Board group – Wgroup (18 subjects) and Control Group - Cgroup (18 subject). All subjects were evaluated with EDSS, Ambulation Index (AI), Berg Balance Scale (BERG), Modified Fatigue Impact Scale (MFIS), stabilometric recording under two conditions: open eyes (STABOE) and closed eyes (STABCE) at T0 and at T1. All participants received a rehabilitation treatment (12 sessions, 60 min each) with a standardized protocol for the Cgroup and a Wii Balance Board protocol for Wgroup. Primary outcome was Berg balance scale, secondary outcomes were: Ambulation Index, MFIS, STABOE and STABCE. **Results.** For Wgroup data showed a statistically significant differences between T0 and T1 for all outcomes considered in the study. In particular AI, MFIS and BERG showed a p < 0,001. STABOE and STABCE showed a p<0,05. For Cgroup data showed statistically significant differences between T0 and T1 for AI and MFIS (p<0,05), while non statistically significant differences were found for BERG, STABOE and STABCE. **Conclusion.** Balance rehabilitation with a portable, widely used, force platform appeared to be an useful tool in improving balance skills in subjects with multiple sclerosis. The results of this study will serve as the basis for a larger trial in order to better differentiate efficacy among traditional rehabilitation techniques and new approaches.

References

- Rougier P, Faucher M, Cantalloube S, Lamotte D, Vinti M, Thoumie P. How proprioceptive impairments affect quiet standing in patients with multiple sclerosis. *Somatosen Mot Res*. 2007 Mar-Jun;24(1-2):41-51.

Post VOID residual (PVR) evaluation in ms patients

M.L. Lopes de Carvalho, G. Bricchetto, R. Motta, M.A. Battaglia
Italian Multiple Sclerosis Society, Rehabilitation Centre, Genova Italy

Introduction. Over 80% of MS patients have symptoms of lower urinary dysfunction during the disease course. One of the most present symptoms it's retention that, usually, it's not perceived by the person[1]. This study is designed to identify MS patients with retention followed at home by the rehabilitation service and to evaluate the correlation between symptoms and PVR. **Materials and methods.** We studied 509 MS patients with Bladder Scan followed at home by AISM Rehab Centre. The following data were recorded: age, disease duration, EDSS, urinary symptoms, current bladder management, n° of uri-

nary tract infections in the last year, urological investigations. All data were analysed with descriptive analysis, multifactorial analysis and linear regression analysis. **Results.** Patients were divided in asymptomatic (55 subjects; 10,8%) and symptomatic (454 subjects; 89,2%). Mean post void residual (PVR) for both symptomatic and asymptomatic group was $131,38 \pm 130,73$ ml. Mean PVR for Asymptomatic group was $78,81 \pm 97,93$ ml. while in Symptomatic group was $137,67 \pm 132,81$ ml. PVR analysis showed an high prevalence of PVR > 100ml in the whole MS population (symptomatic and asymptomatic group). Statistical analysis shows no statistical significant correlation between all parameters considered and PVR with the exception of retention symptom ($p < 0,001$). Linear correlation shows a significant correlation between EDSS and PVR (r square: 0,05; $p < 0,001$). **Conclusion.** Results showed that about 90% of MS population included in the study experience bladder problems during the course of the disease. The high prevalence of PVR > 100ml in MS subjects underlined the importance of detecting bladder disturbances at an early stage of the disease in order to protect and preserve renal function and suggest to use BladderScan routinely as a screening to detect retention.

References

1. Betts, C.D., M.T. D'Mellow, and C.J. Fowler, Urinary symptoms and the neurological features of bladder dysfunction in multiple sclerosis. *J Neurol Neurosurg Psychiatry*, 1993. 56(3): p. 245-50.

Osteopoikilosis: a cause of elevated bone mineral density on dual x-ray absorptiometry measurement in a young woman

Asylbek Kaparow, Murat Uludağ, Hidayet Sari, Ülkü Akarirmak
 Istanbul University Cerrahpaşa Medical Faculty, Department of Physical Medicine and Rehabilitation

Introduction. Osteopoikilosis (osteopathia condensans disseminata, spotted bone; OPK) is an asymptomatic, rare bone dysplasia. OPK is generally diagnosed incidentally on plain radiographies. These diagnostic lesions are typically diffuse, round and symmetrically shaped sclerotic bone areas. OPK is also a dysplasia characterized with increased bone mineral density (BMD). Falsely high BMD on DXA may be caused by a vertebral wedge or crush fracture, degenerative diseases, Paget's disease, sclerotic metastases, vertebral hemangioma and other sclerotic bone disorders. We present a case of OPK with elevated BMD of lumbar spine and femur neck on DXA scan in a young female patient. **Case.** A 25-year-old woman was admitted to our outpatient clinic with complaints of right wrist and low back pain for 3-4 years. ROM of low back was minimally restricted and was more painful in extension. Roentgenograms (X-rays) revealed numerous small round foci of bony sclerosis on radius, ulna, carpal and metacarpal bones as well as in the pelvis and upper heads of the femur and humerus. Bone scintigraphy for whole body with Tc-99m was normal. BMD measurement was performed using a Hologic QDR. Bone density of the lumbar spine reveals an L1-L4 measurement of 1.202 g/cm², which is 116% of the age matched normal. This finding corresponds to a T-score of +1.47. Bone density of neck of the left hip is 1.040 g/cm². This finding represents 116 % of the age-matched normal value. This finding corresponds to a T-score of +1.47. **Conclusion.** OPK is a dysplasia characterized with increased bone mineral density; however a study about quantity of this elevation has not been reported yet. In young persons who have elevated scores in DXA measurement, OPK as well as other sclerosing bone disorders should also be considered. This is the first report of OPK revealing increased spine and femoral neck BMD on DXA measurement.

Comprehensive rehabilitation programs may improve some of the ambulatory blood pressure monitoring parameter

M. Iurciuc¹, C. Avram², S. Iurciuc¹, A. Vlad¹, L. Craciun¹, D. Stancila¹, D. Gaita¹, S. Mancas¹

¹University of Medicine Timisoara, Romania

²West University, Sport dep., Timisoara, Romania

Background. Cardiovascular events have their greatest impact in the morning period. This is thought to be associated with and dependent on morning blood pressure surge (MBPS)¹. **Introduction.** Our aim is to show that exercise training par of rehabilitation program, may improve some of the hemodynamic parameters of the ambulatory BP monitoring and the MBPS. **Materials and methods.** We

selected 205 patients with essential hypertension, aged: 40-70years. They were under unchanged medication at least 1months and at target BP value². We evaluate these patients before and after a 4months exercise training. We studied the ambulatory blood pressure monitoring/24h parameter: systolic blood pressure(SBP), diastolic blood pressure(DBP), mean blood pressure(MBP), pulse pressure(PP), heart rate(HR), ambulatory arterial stiffness index(AASI) defined as $1-\alpha$ (α = regression slope between TAD and TAS), MBPS1= mean SBP in the first 2h after awoken - the average of the lowest 3nocturnal values, MBPS2= mean SBP in the first 2h after awoken - mean SBP value in the first 2h pre awake (before awake), daytimeSBP - nighttimeSBP (D-NSBP). **Results.** The SBP has decreased from 124,75 to 118,23mmHg ($p,0002$); the DBP has decreased from 71,54 to 70,36mmHg($p,1635$); the MBP has decreased from 89,36-87,57mmHg($p,0419$); the PP has decreased from 56,99-53,09mmHg($p,0021$); the HR has decreased from 71,59-64,49b/min ($p,0019$); the AASI has decreased from 0,689-0,589($p,0069$); MABS1 has decreased from 13,81-10,26mmHg($p,0019$); MABS2 has decreased from 11,89-7,48mmHg($p,0012$), D-NSBP has decreased from 15,99-13,34mmHg($p,0029$). **Conclusion.** Rehabilitation programs can improve some of the hemodynamic parameters: SBP, MBP, and HR. Physical training, part of the cardiovascular rehabilitation plays an important role in decreasing MBPS. The parameters that describe arterial stiffness: AASI and PP can also be improved. Controlled exercise training programs are also a safe and effective method for reducing cardiovascular risk.

References

¹ESC Congress Barcelona Spain Aug 2009
²ESC/ESH Guideline 2007

Rehabilitation of critical illness polyneuropathy and myopathy patients

Primoz Novak, Zala Kuret, Gaj Vidmar
 Institute for Rehabilitation, Republic of Slovenia

Introduction. Critical illness polyneuropathy and myopathy frequently develops in patients hospitalized in intensive care units (1, 2). Number of these patients admitted to our Institute is increasing. The aim of the study was to evaluate the outcome of rehabilitation from the aspect of body functions and activities. **Materials and methods.** 28 critical illness polyneuropathy and myopathy patients, aged on average 59.4 years (SD 15.9), range 26–85 years) were included in the study. The diagnosis was established clinically and confirmed electrophysiologically. Manual Muscle Testing was used for assessment of function. Activity was assessed using the Functional Independence Measure (FIM) and two walking tests. Tests were performed at admission and discharge. Statistical analyzes was made using paired sampled t-test, Pearson's (r) and Spearman's (ro) correlation coefficient. **Results.** Clinically important and statistically significant improvements were achieved with rehabilitation in all observed measures ($p < 0.001$). High and significant correlations were found between the measures ($r=0.564-0.990$, all $p \leq 0.005$), except between muscle strength and the results of walking tests. Improvement in body functions during rehabilitation significantly decreases as time from established diagnosis to start of rehabilitation increases ($ro=-0.461$, $p=0.02$), but it is not significantly related to rehabilitation duration ($p=0.109$). **Conclusion.** Clinically important and statistically significant improvements in body function as well as activities were achieved in critical illness polyneuropathy and myopathy patients with relatively short rehabilitation.

References

1. van der Schaaf M, Beelen A, de Vos R. Functional outcome in patients with critical illness polyneuropathy. *Disability and rehabilitation* 2004; 26: 1189–97.
 2. van der Schaaf M, Beelen A, De Groot IJM. Critical illness Polyneuropathy: a summary of the literature on rehabilitation outcome. *Disabil Rehabil* 2000; 22: 808–10.

Post-discharge reassessment in stroke patients: can we improve rehabilitation services and patients' quality of life?

S. Fugazzaro, B. Piccinelli, V. Stigliano, S. Testoni, G.B. Camurri
 Rehabilitation Ward Arcispedale S.Maria Nuova (ASMN), Reggio Emilia, Italy

Introduction. Management of patients after discharge from hospital receives much less attention in the research literature than

does acute stroke. We examined prospectively 100 patients with stroke discharged from our rehabilitation ward. Our purpose was: to measure functional independence in the first year after stroke; to measure specific needs in outpatients rehabilitation; to assess the quality of existing outpatients pathways and to define best modalities for future projects. **Materials and methods.** We started an observational cohort study in September 2008 and collect data at 3 and 12 months from stroke. The post-discharge multidisciplinary reassessment evaluated impairment recovery, functional status and social participation. **Results.** We present our data on 100 subjects (mean age 69,6 ($\pm 14,3$)) regarding functional assessment (Barthel Index), comorbidity and readmission to hospital, care-givers burden, long-term use of adaptive devices, patients social participation (return to work, return to driving). **Conclusion.** There are several RCT and Cochrane reviews on acute stroke management and inpatients rehabilitation. Few trials analyse the postdischarge period, no meta-analysis exist on best timing for standardized reassessment or best rehabilitation intervention. Post-stroke long-term management may present an important opportunity for improvements and for multidisciplinary rehabilitation research. We pointed out patient difficulties in the first months after stroke and we are working on projects to improve our post-discharge rehabilitation services.

The primary goals of early rehabilitation are to prevent complications and maximize function, to allow patient social participation, but how can we help people maintaining a good functional status and improve their quality of life? We think rehabilitation needs to focus on "home-time" and participation in the near future, not only on the acute phase, which is now well organized in Reggio Emilia.

References

- Williams, Rudd, "Advances in Health Policy and Outcomes 2009" Stroke 2010;41:e77-e80.
Lalit Kalra "Stroke Rehabilitation 2009 Old Chestnuts and New Insights" Stroke 2010;41:e88-e90.
Duncan et al "Management of Adult Stroke Rehabilitation Care: A Clinical Practice Guideline" Stroke 2005;36:e100-e143.

Treatment with Botulinum Toxin A for Stump Hyperhidrosis in Amputees

M. Alvarez Sala, R. Sanchez Fernandez, D. Romero Torres, P. Diaz Borrego

Department of Physical Medicine and Rehabilitation, Virgen Macarena University Hospital, Seville, Spain.

Introduction. Stump hyperhidrosis is a major problem in leg amputees and is linked to skin problems. There is increased evidence of the effectiveness of botulinum toxin A (BTXA) for focal hyperhidrosis of a stump. **Materials and methods.** The objective of this study was to describe the injection technique, and to evaluate the effectiveness of treatment with BoNTA for the excessive sweating of the stump in lower limb amputation patients. This is a seven-year prospective study in which 13 amputee patients with stump hyperhidrosis received a total of 43 cycles of treatment with BTXA (Botox®). Inclusion criteria: excessive sweating not controllable with topical antiperspirant agents and high functionality with prostheses use. The effectiveness of the treatment was assessed by visual analog scale (VAS) of sweating, QoL and adapted COOP/WONCA questionnaire of QoL. **Results.** The results were analyzed using the Wilcoxon test. We observed a statistically significant improvement in stump hyperhidrosis ($p < 0.001$); perceived QoL ($p < 0.001$); physical fitness ($p < 0.01$); feelings ($p < 0.05$); daily activities ($p < 0.01$); social activities ($p < 0.05$); changes in health status ($p < 0.001$); overall health ($p < 0.01$); pain in the stump ($p < 0.005$). **Conclusion.** We found that intradermally injections of BTXA were an effective and safe therapeutic option for patients with stump hyperhidrosis. We observed also an improvement in QoL and a best use of prosthesis. This could reduce the incidence of several dermatologic problems often associated with extremity amputations and prostheses use.

References

- Diaz-Borrego P, Alvarez-Sala M, Delgado-Mendilivar J. Hiperhidrosis del muñon en amputado tibial. Tratamiento con toxina botulinica. Rehab (Madr) 2004;38(1):173.
Dudek NL, Marks MB, Marchal SC. Skin problems in an amputee clinic. Am J Phys Med Rehab 2006;85(5):424-9.

A new device to measure adherent scar: validity, reliability and sensitivity to change

G. Ferriero¹, S. Vercelli¹, L. Salgovic², V. Stissi³, F. Sartorio¹

¹Unit of Occupational Rehabilitation and Ergonomics, Fondazione Salvatore Maugeri, Clinica del Lavoro e della Riabilitazione, IRCCS, Veruno (NO), Italy.

²University sv. Cyrila a Metoda (UCM), Trnava, Slovak Republic.

³Hand Unit, Plastic Surgery Department, University of Milan, Multimedita Holding IRCCS, Italy.

Introduction. The assessment of pathological postsurgical scars is crucial for planning their treatment. Adherent scars are usually assessed only by simple manual evaluation and ordinal scales. This study presents a new device, the Adheremeter, to objectively measure scar adhesion, and assesses its validity, reliability and sensitivity to change. **Materials and methods.** Two independent raters measured with the Adheremeter scar mobility and contralateral normal skin in a sample of 25 patients affected by adherent postsurgical scar, before (T1) and after (T2) physical therapy. Two indices of scar mobility were calculated: the adherence's surface mobility index (SM_A), and the adherence severity index (AS). Their correlation with the Vancouver Scar Scale (VSS) and its pliability subscale (PL-VSS) was assessed for the validity analysis. **Results.** Both SM_A and AS showed good-to-excellent intra-rater (intraclass correlation coefficient with 95% confidence interval [ICC]=.96) and inter-rater reliability (SM_A : ICC=.97 and .99; AS: ICC=.87 and .87, respectively at T1 and T2). The two indices correlated moderately with VSS and PL-VSS only at T1 (r_s ranged from -.58 to -.66), and for both raters were able to detect changes: $z = -4.09 / -3.88$ for SM_A , and $-4.32 / -4.24$ for AS (always $p < .001$); effect size for SM_A was .6/.4, and for AS 1.4/1.2; SEM was 4.59/4.79mm² for SM_A , and .05/.06 for AS, and the minimum detectable change was 12.68/13.23mm² for SM_A , and .14/.17 for AS. **Conclusion.** The Adheremeter shows a good level of reliability, validity, and sensitivity to change in adherent postsurgical scars.

References

- Ferriero G, et al. Validation of a new device to measure postsurgical scar adherence. Phys Ther 2010;90(5):in press.
Vercelli S, et al. How to assess postsurgical scars? A review of outcome measures. Disabil Rehabil 2009;31:2055-63.
Nedelec B, et al. Rating the resolving hypertrophic scar: comparison of the Vancouver Scar Scale and scar volume. J Burn Care Rehabil 2000;21:205-12.

Does educational level affect rehabilitation outcomes after tbi?

S. Di Carlo¹, L. Cocchini², A. Eskenazi², C. Macchetta², M. Beatrice², A. Fogliato³, G. Massazza⁴

¹Medico Specializzando,

²Medici specialisti in Medicina fisica e Riabilitazione

³logopedista, A.S.O. CTO-Maria Adelaide, S.C. Recupero e Riabilitazione Funzionale

⁴Direttore Scuola di Specializzazione in Medicina Fisica e Riabilitazione, Università degli Studi di Torino, Scuola di Specializzazione in Medicina Fisica e Riabilitazione

Introduction. In the current literature there is a substantial lack of data regarding the impact of educational level on neurorehabilitation outcomes after Traumatic Brain Injury (TBI). **Materials and methods.** We conducted a retrospective, observational study enrolling 107 consecutive patients presenting TBI. All subjects were admitted at our Center from March, 2001 to August, 2008. They were divided into 2 groups according to years of instruction (group A > 8 years, group B < 8 years). The groups were similar in all baseline (sex, age, sample of size, LCF at admission) and clinical characteristics such as memory, attention, disorientation, post-traumatic amnesia, problem-solving, anosognosia, aphasia, apraxia, behavioural and motor deficits. **Results.** After the neurorehabilitation both group A and B improved in all the evaluated superior cortical functions. However patients in group A had significantly lower anosognosia rates than patients in group B (48% vs 31,6% respectively, $p = 0.03$). Regarding the problem-solving, there has been a significant benefit in group A than group B (48 % vs 68,4 % respectively, $p = 0.03$). At discharge the two groups had similar level of cognitive functioning (LCF) score. **Conclusion.** In our study a higher educational level correlated with a better outcome in anosognosia and problem-solving. All other cognitive functions equally improved in the two groups as also demonstrated by LCF score at discharge.

References

1. Prognostic value of demographic characteristics in traumatic brain injury: results from the IMPACT study. Mushkudiani NA, Engel DC, Steyerberg EW, Butcher I, Lu J, Marmarou A, Sliker F, McHugh GS, Murray GD, Maas AI. *J Neurotrauma*. 2007 Feb;24(2):259-69.
2. The effect of premorbid demographic factors on the recovery of neurocognitive function in traumatic brain injury patients. Jeon IC, Kim OL, Kim MS, Kim SH, Chang CH, Bai DS. *J Korean Neurosurg Soc*. 2008 Nov;44(5):295-302. Epub 2008 Nov 30.
3. Measuring premorbid IQ in traumatic brain injury: an examination of the validity of the Wechsler Test of Adult Reading (WTAR). Green RE, Melo B, Christensen B, Ngo LA, Monette G, Bradbury C. *J Clin Exp Neuropsychol*. 2008 Feb;30(2):163-72.

Management of spasticity in adults in Arcispedale S.Maria Nuova (ASMN) in Reggio Emilia

S. Fugazzaro, S. Testoni, I. Morbilli, I. Caretta, S. Borghi, R. Ferrari, G.B. Camurri

Rehabilitation Ward Arcispedale S.Maria Nuova (ASMN), Reggio Emilia, Italy

Introduction. The management of spasticity should be undertaken by a coordinated multidisciplinary team, according to RCP guidelines (2009)¹. The purpose of our study is to develop a rehabilitation program for adults with spasticity, to improve baseline and follow-up evaluation of patients with spasticity and to improve patient selection for botulinum toxin treatment (BT). **Materials and methods.** In ASMN a stroke unit is present since 2003 and about 100 people with first stroke enter intensive rehabilitation program every year in our Rehabilitation Ward. About 20% results in spasticity at 3 months-follow-up visit; many patients need general or focal treatment of spasticity because of pain, reduction in mobility performances or poor self-care independence or excessive care-giver burden in ADL. **Results.** 2 years ago we planned a specific project for adults spasticity management and started multidisciplinary training. We present our flow-chart for management of spasticity in ASMN. **Conclusion.** The multidisciplinary management of spasticity can provide accurate assessment and outcome evaluation. We are collecting prospective data on real-life benefits for patients to improve functional evaluation and patients selection for focal treatment with BT in order to satisfy individual goals and to make BT application an effective and cost-efficient practice in our hospital.

References

1. Spasticity In Adults: Management Using Botulinum Toxin. National guidelines. London: RCP, 2009.
2. Jörg Wissel et al. European Consensus Table On The Use Of Botulinum Toxin Type A In Adult Spasticity, *J Rehabil Med* 2009;41:13-25.

Pulmonary postoperative rehabilitation alter lung resection for NSCLC: analysis of feasibility and efficacy

G. Magrone¹, L.M. Lapenna¹, M. Maselli¹, F. Di Bella¹, M. Morrone¹, V. Dall'Armi³, A. Cesario³, P. Granone², S. Sterzi¹

¹CIR, Clinic of Physical Medicine and Rehabilitation, Università Campus Bio-Medico, Roma, Italy

²Division of General Thoracic Surgery, Catholic University, Rome, Italy

³CDC S.Raffaele, Velletri, Italy

Introduction. To date, pulmonary rehabilitation use is still undergoing testing and validation both as a preoperative or postoperative treatment in thoracic surgery. In this study we present our experience of a group of NSCLC patients who undergone pulmonary rehabilitation after lung cancer resection. **Materials and methods.** From 2005 to 2008, 113 patients, treated by lung resection, underwent inpatients rehabilitation program for 4 weeks. All patients were evaluated for pulmonary function before surgery (T0) and at the end of rehabilitation (T1). The analysis was performed evaluating the pulmonary function parameters (static and dynamic volumes) 6-minute walking test (6MWT) and test scores of dyspnoea (measured by Borg scale). Variables were compared by t-tests and linear regression analysis. **Results.** Among the parameters analyzed, we observed a significant variation of the following parameters: BORG scale and 6MWT. The linear regression analysis confirmed the statistically significant increase from T0 to T1 for the 6MWT ($p < 0.001$) and a significant decrement of the degree of dyspnoea ($p < 0.001$). **Conclusion.** This work demonstrates the effectiveness of postoperative respiratory rehabilitation of patients undergone lung resection. We observed the improving of exercise tolerance and the reduction of the degree of dyspnoea. Further prospective studies and in particular on the assessment of quality of life are ongoing.

References

1. Post-operative pulmonary rehabilitation after lung resection for NSCLC: a follow up study. Cesario A, Dall'Armi V, Cusumano G, Ferri L, Margaritora S, Cardaci V, Cafarotti S, Russo P, Paleari L, Sterzi S, Pasqua F, Bonassi S, Granone P. *Lung Cancer*. 2009 Nov;66(2):268-9.

Rehabilitation needs in patients with bone metastases : result of multidisciplinary approach.

M. Maselli¹, L.M. Lapenna¹, F. Di Bella¹, S. Miccinilli¹, V. Lauria¹, A. Tataranno¹, A. Bica¹, M.Morrone¹, A. Listrani¹, G. Magrone¹, N. Papapietro³, D. Santini², S. Sterzi¹

¹CIR, Clinic of Physical Medicine and Rehabilitation, Università Campus Bio-Medico, Roma, Italy

²CIR, Clinic of Oncology, Università Campus Bio-Medico, Roma, Italy

³CIR, Clinic of Orthopaedic, Università Campus Bio-Medico, Roma, Italy

Introduction. Bone metastases are responsible for high morbidity in cancer patients including severe pain, hypercalcemia, pathologic fracture, and spinal cord and/or nerve root compression. The frequency of pain and other serious complications associated with such metastases depends on the site and type of lesions and preventive therapy. Treatment and prevention of fracture and spinal cord injury are very important not only to maintain good QOL but also to improve survival. A multidisciplinary approach that integrates the diagnosis and treatment of the cancer, symptom management, and rehabilitation ensures optimal care. The present paper aims to create a new organizational health care model specifically designed for patients with bone metastases with the aim to decrease morbidity, to reduce frequency of complications, to limit psychophysical distress and to improve quality of life. **Materials and methods.** Since November 2008, when the Osteo-Oncology Ambulatory was opened in our Hospital to provide multidisciplinary care for patients with bone metastases, 119 accesses were collected. **Conclusion.** What we expect to find out, by a retrospective analysis of collected data, is the high rehabilitation need of patients with bone metastases: especially for what concerns transfers, QOL, decreasing pain, confirming the usefulness of a multidisciplinary center for the management of patients with bone metastases.

References

1. The multidisciplinary approach to bone metastases. Blum RH, Novetsky D, Shasha D, Fleishman S. Department of Medicine, Albert Einstein College of Medicine, New York, USA. *Oncology (Williston Park)*. 2003 Jun;17(6):845-57; discussion 862-3, 867.

The impact of new technologies on the rehabilitation team: the experience of Aria

L. Tosi, G. Nofri, R. Spidalieri, A. Testa, A. Giustini, L. Cavallini, P. Zappalorti, C. Sperandio

Istituto Privato di riabilitazione Madre della Divina Provvidenza - Agazzi (Ar)

Recent neurophysiologic findings modified rehabilitation strategies. Optimize health care system charge required to decrease treatment duration. New technologies can be helpful. Aria has provided with new technologies for rehabilitation a team working there since many years. This impact was like the one of industrial revolution on workers in XVIII century. Set up work method. Training to assign technologies to qualified operator. Increased duration of treatment. New devices as tools in rehabilitation project. Patients and their family enthusiastic, sometimes too much. Integration between new technologies and therapist is complex: acceptance of new work methods, not more direct relationship with patients and challenging training. Absence of standardized protocols and of clinical efficacy evidences. Top grade specialization of therapist determine fragmentary vision of patient: team meeting is essential. External consultant necessary to compare experience. Biomedical technologies cannot replace therapists.

References

- Stein J., *Eur J Phys Rehabil Med.* 2009 Jun; 45 (2): 255-8, Adopting new technologies in stroke rehabilitation: the influence of the US health care system.
- O'Dell MW, Lin CC, Harrison V., *Annu Rev Med*. 2009; 60: 55-68, Stroke rehabilitation: strategies to enhance motor recovery.
- Patton J, Small SL, Zev Rymer W, *Top Stroke Rehabil*, 2008 Nov-Dec; 15 (6): 521-41, Functional restoration for the stroke survivor: informing the efforts of engineers.
- Ring H, Keren O, Zwecker M, Dymia A, *Isr Med Assoc J*, 2007 Oct; 9 (10): 713-6, Use of medical technologies in rehabilitation medicine settings in Israel: results of the TECHNO-R 2005 survey.

Quantitative Analysis of Upper Limb Robotic Therapy in Chronic Stroke

L. Zollo¹, E. Gallotta², L.M. Lapenna², E. Guglielmelli¹, S. Sterzi²

¹Laboratory of Biomedical Robotics and Biomicrosystems, Università Campus Bio-Medico, Rome, Italy

²CIR, Clinic of Physical Medicine and Rehabilitation, Università Campus Bio-Medico, Roma, Italy

Introduction. The use of robotic technology for assessment has the potential to provide therapists with objective, accurate, repeatable measurements of subject's function. However, despite the increasing number of clinical studies examining the effect of robotic training on stroke rehabilitation, functional assessment is typically carried out through traditional human-administered clinical scales [1]. This work aims at providing a complete set of kinematic and dynamic indices for an objective measure of the effect of robot-aided therapy, and testing their correlation with clinical scales. **Materials and Methods.** A prospective observational study was carried out on fifteen community-dwelling persons with chronic stroke. Upper limb robotic therapy was administered to patients. Kinematic and dynamic performance indices were extracted from position and force data recorded with the InMotion2 robot. A linear regression analysis was carried out to study correlation with clinical scales. **Results.** An average increase of Fugl-Meyer scores by 9.9% and Motor Power scores by 6.9% from admission to discharge were elicited. Furthermore, a significant improvement of kinematic motor performance was always obtained; the improvement of dynamic components (mainly in terms of energy) was significant only in resistive motion and highly correlated with Motor Power. **Conclusion.** The authors identified a set of kinematic and dynamic indices for quantitative evaluations of patients recovery following rehabilitation. Preliminary results on fifteen chronic stroke patients are reported in the paper.

References

1. Bosecker C, Dipietro L, Volpe B, Krebs HI, Kinematic Robot-Based Evaluation Scales and Clinical Counterparts to Measure Upper Limb Motor Performance in Patients With Chronic Stroke. *Neurorehabil Neural Repair*. 2009 (DOI:10.1177/1545968309343214).

Cardiopulmonary disability and rehabilitation: an Italian survey

M. Massucci¹, L. Perrero² on behalf scientific section "Cardiopulmonary disability in rehabilitation" of the Italian Society of Physical and Rehabilitation Medicine (SIMFER).

¹U.O.Centro Ospedaliero Riabilitazione Intensiva, ASL2 of Umbria, Hospital of Passignano (Pg)

²Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy.

Introduction. The cardiopulmonary rehabilitation in Italy is managed by medical doctor with different specialization and different modalities of organization. The aim of the study is to evaluate with a questionnaire the diffusion and the organization of cardiopulmonary rehabilitation activities in Italy. **Materials and methods.** The survey consist in the diffusion through e-mail of a questionnaire to 32 medical experts in rehabilitation medicine enrolled in the scientific section named "Cardiopulmonary disability in rehabilitation" of the Italian Society of Physical and Rehabilitation Medicine (SIMFER). **Results.** The questionnaire has been compiled by 14 (44%) rehabilitation ward on 32. The inpatient division are 9 while the outpatients rehabilitation structure 12. The structures directed by Psychiatrist (7, 50%) include in the medical team Pulmonologist, Cardiologist or other specialists only in 3 of cases. In 8 structures the rehabilitation project is started in acute ward by Psychiatrist. In the other 6 is compiled by Cardiologist, Pulmonologist or medical doctor with others specialists. Cardiologic disability is estimated 42% of the total. The main frequent diseases are Acute Myocardial Infarction, Cardiac Surgery sequelae and Heart Failure (NIHA III-IV). About pulmonary pathology (58%), C.O.P.D. exacerbations, Lung Fibrosis and Thoracic surgery sequelae are the principal diseases observed. The instrumental tests for cardiac or respiratory functional evaluation is managed by Psychiatrist only in 37% of cases. 50% of interviewed doctors does not manage the pharmacologic therapy. 50% manage it only in collaboration with others specialists. About the Psychiatrist work satisfaction, the answer most frequent (43%) was "enough". **Conclusion.** The Psychiatrist has already a relevant role in the management of cardiopulmonary rehabilitation project from acute phase to discharge even if the prevalence must be improved¹.

References

1. Massucci M et al. L'impatto della comorbilità cardiorespiratoria in riabilitazione ospedaliera: il risultato di una indagine italiana. Proceedings of XXXVII° Congress of S.I.M.F.E.R. Sept 20-23 2009, Campobasso.

Acknowledgments: we thank the participants in data collection: P. Genovese (Monseice-Pd), EG. Mantellini (Alessandria), T. Scellini (Campobasso), G. Magrone (Roma), F. Volpato (Torino), V. Simone (Foggia), G. Lenti (Pc), M. Giordano (Cuneo), C. D'Aurizio (Venafrò-Is), S. La Bruna (Mormanno, Cs), G. Caprioli (Bergamo), S. Buoso (Mirano, Ve), V. Santoro (Prato), P. Vista (Salerno).

Evaluation of activities and participation of patients with rheumatoid arthritis and identification of influencing environmental factors using ICF

A. Jucevičius^{1,2}, M. Tamulaitienė², I.E. Jamontaitė^{1,2}, Z. Romanovskaja¹

¹Vilnius University, Medical faculty, Rehabilitation, Sports medicine and Nursing institute

²Vilnius university hospital Santariškių clinics, Rehabilitation, Physical and Sports medicine centre

Introduction. ICF methodology gives an opportunity to evaluate activities and participation of patients with rheumatoid arthritis and to identify environmental influence. The aim of the study was to evaluate activities and participation of patients with rheumatoid arthritis using ICF and to define patients' participation and activity correlation with functional abilities. **Materials and methods.** In study participated 40 patients with rheumatoid arthritis, from which 42,5% had II disease activity degree, 50% - III. 33 (82,5 %) of participants were females and 7 (17,5 %) – males, all patients average of age was 59,9±13,4 years. Patient's functional abilities were tested using modified functional movement test (by W. Keitel), environment factors, activities and participation were assessed using ICF core sets applied for people with rheumatoid arthritis. **Results.** Using ICF instrument we found out the rate of patients with mostly impaired activities (3-4 points): standing (32,5%), maintaining a kneeling position (87,5%), walking around obstacles (62,5%), driving (57,5%), washing whole body (77,5%), shopping (52,5%), cleaning living area (62,5%). Patients pointed main barriers and facilitators of environment. There were found moderate correlation between functional abilities evaluated according Keitel index and writing, using communication equipment and devices, lifting and holding things, using hand and arm, standing, walking and moving, driving, taking care of oneself and performing domestic life activities (p<0,05). **Conclusion.** ICF provides the opportunity more comprehensive evaluate patients with rheumatoid arthritis activity, participation and determine environment factors, to find out relation between capacity and performance.

References

1. Boonen A, Rasker J, Stucki G. The international classification for functioning, disability and health. A challenge and a need for rheumatology. *Clinical Rheumatology*, 2007, 10:1007-1067.
2. Stucki G, Cieza A. The international Classification of Functioning, Disability and Health (ICF) Core Sets for rheumatoid arthritis: a way to specify functioning. *Annals of the Rheumatic Diseases*, 2004, 63:40-45.
3. Uhlig T, Moe R, Stucki G, Reinsberg S, Cieza A. Responsiveness of the ICF Core Set for rheumatoid arthritis. *Annals of the Rheumatic Diseases*, 2008, 10:1136.

Quality of life and physical activity in patients with chronic renal failure

I.E. Jamontaitė^{1,2}, L. Aučnyienė^{1,2}, T. Palšytė^{1,2}, T. Sinevičius²

¹VU Medical Faculty Rehabilitation, Sports medicine and Nursing Institute

²VU hospital Santariškių clinics Rehabilitation, Physical and sports medicine centre

Introduction. Physical activity for patients with chronic renal failure helps to prevent complications and keep vital functions. The aim of the study is to evaluate patients' with chronic renal failure quality of life and physical activity in order to prepare individual physical therapy program. **Materials and methods.** The study was carried out in 4 hospitals of the Vilnius City in 2009. The study included 88 patients. Quality of life assessment was made by the quality of life questionnaire SF-36, physical activity setting - by questionnaire. **Results.** 38 % of respondents were males and 62 % - females. The average age of patients – 63,3±12,4 years. All subject's diagnosis was chronic renal failure and they had 3 dialysis per week. The

study results showed that 24 (27,3%) patients perform physical exercise, 64 (72,7%) - fails. 40 (62,5%) patients are not physically active because of pain, 24 (37,5%) due to lack of motivation and lack of information about the physical activity. Physically active patients group spent approximately 15 - 30 min doing daily home program exercises. The analysis of SF-36 questionnaire showed that 65,2% of patients their health described as poor and 34,8% - as satisfactory. None of the patients described their health as good, very good or excellent. 91,3% of the patients assessed their physical health as worse than average, 8,7% - slightly better than average. 69,6% of the patients assessed their mental health as worse than average, 30,4% - slightly better than average. 69,6% of respondents quality of life can be seen as poor and very poor, 26,1% - as average or below average. **Conclusion.** Most of the patients with chronic renal failure were physically passive, their physical activity was limited by psychoemotional problems too. Therefore individual multidisciplinary rehabilitation program is needed to improve patient's quality of life.

References

Gregory R., Norsratola D. Skeletal muscle dysfunction in chronic renal failure: effects of exercise. *Am J Physiol Renal* 2006; 290:753-761.
 Cheema B. et al. Progressive resistance training during hemodialysis: Rationale and method of a randomized controlled trial. *Hemodialysis International* 2006, 10 (3), 303-310.
 Kathy E et al. Exercise capacity as a predictor of survival among ambulatory patients with end-stage renal disease. *Kidney International* 2004; 65:719-724.

The mobility relation to person's work-oriented activities after spinal cord injury

A. Cirtautas^{1,2}, I. E. Jamontaitė^{1,2}, J. Bernatavičius¹, L. Varnienė¹

¹Vilnius University, Faculty of Medicine, Rehabilitation, Sports medicine and Nursing Institute

²Vilnius University hospital Santariškių clinics, Rehabilitation, Physical and Sports medicine centre

Introduction. Participation, education and functional independence level have impact on persons work-oriented activities after SCI. These factors may closely relate to mobility. The aim is to evaluate the person's work-oriented activities after SCI according their mobility. **Materials and methods.** The study was done during summer camp organized by the Landscape therapy and recreation centre for persons after SCI in 2009. The data were gathered interviewing 80 participants of the camp mainly with complete SCI (Asia A). According questionnaire has been identified persons work-oriented activities, mobility, ability to drive a car, participate in social life and education. **Results.** In study participated 34 female and 46 male after SCI. The average of age of participants was 43,75±15,2 years. According their mobility there were divided 3 groups: 1st group – walking with assistive aids; 2nd group – moving independently in wheelchair; 3rd group – moving with assistance in wheelchair. The study results showed that in the 1st group 4 participants from 8 have work-oriented activities, in the 2nd group - 24 from 45 and the 3rd - 10 from 27. The analysis of persons ability to drive a car showed, that in 2nd group 44,4% drive a car and have work-related activities and 52,4% drive a car but haven't work-related activities. **Conclusion.** The persons after spinal cord injury work-oriented activities are related to their mobility. We didn't find a close relation between ability to drive a car and their work-oriented activities. More comprehensive evaluation is needed to achieve main goal – reintegration of persons with SCI. The preliminary study using ICF instrument shows that it is a good opportunity to apply it for those reasons.

References

G. A. Zäch, H. G. Koch. Paraplegie. 2005, 607.
 M. Franceschini, B. Di Clemente, A. Rampello, M. Nora and L. Spizzichino. Longitudinal outcome 6 years after spinal cord injury. *Spinal Cord* (2003) 41, 280-285.
 K. W. Hammell. Quality of life among people with high spinal cord injury living in the community. *Spinal Cord* (2004) 42, 607-620.

A new 14-item scale for measuring dynamic balance: the mini-BESTest

F. Franchignoni¹, M. Godi², A. Nardone^{2,3}, A. Giordano⁴, G. Ferriero¹, F. Horak⁵

¹Unit of Occupational Rehabilitation and Ergonomics, Salvatore Maugeri Foundation, Clinica del Lavoro e della Riabilitazione, IRCCS, Veruno (NO), Italy

²Dept. of Physical Medicine and Rehabilitation, Salvatore Maugeri Foundation, Clinica del Lavoro e della Riabilitazione, IRCCS, Veruno (NO), Italy

³Department of Clinical and Experimental Medicine, University of Eastern Piedmont, Novara, Italy

⁴Unit of Bioengineering - Salvatore Maugeri Foundation, Clinica del Lavoro e della Riabilitazione, IRCCS, Veruno (NO), Italy

⁵Department of Neurology, Oregon Health and Science University, Portland, OR, USA,

Introduction. Aim of this study is to improve, with the aid of psychometric analysis, the Balance Evaluation System's Test (BESTest), a tool designed to analyse several postural control systems that may contribute to poor functional balance in adults. **Materials and methods.** We examined performance of the BESTest in a convenience sample of 115 consecutive adult patients with diverse neurological diagnoses and disease severity, referred to rehabilitation for balance disorders. Factor (both explorative and confirmatory) and Rasch analysis were used to process the data in order to produce a new, reduced and coherent balance measurement tool. **Results.** Factor analysis selected 24 out of the 36 original BESTest items likely to represent the unidimensional construct of 'dynamic balance'. Rasch analysis was then used to: 1) improve the rating categories, and 2) delete 10 items (misfitting or showing local dependency). The model consisting of the remaining 14 tasks was verified with confirmatory factor analysis to meet the stringent requirements of modern measurement. **Conclusion.** The new 14-item scale (dubbed mini-BESTest) focuses on dynamic balance, can be conducted in 10-15 minutes, and contains items belonging evenly to four of the six sections from the original BESTest. Further studies are needed to confirm the usefulness of the mini-BESTest in clinical settings.

References

Franchignoni F, et al. Using psychometric techniques to improve the Balance Evaluation System's Test: the mini-BESTest. *J Rehabil Med* 2010, in press.
 Horak FB, et al. The Balance Evaluation Systems Test (BESTest) to differentiate balance deficits. *Phys Ther* 2009;89:484-98.

Defining success after upper limb loss

P. Gallagher, S. NiMhurchadha, S. Wegener, M. MacLachlan

Dublin City University, The Johns Hopkins School of Medicine, Trinity College Dublin

Introduction. There is wide variation in the literature concerning the definition of 'successful prosthesis use'. The aim of this research was to reach consensus on the definitions of successful outcomes in three key areas, 'prosthesis use', 'activities and participation' and 'self image' following upper limb loss (ULL). **Materials and methods.** A three-round Delphi study was conducted in order to reach consensus. Items from the Delphi study were developed from the literature on ULL and from prior qualitative studies with rehabilitation professionals (RP's) and individuals with ULL. 53 experts that were recruited internationally completed all rounds of the Delphi; 38 RP's, 13 individuals with ULL and 2 people with ULL who were also RP's. **Results.** Consensus was reached on 25 of 28 statements concerned with defining successful outcomes. Of these, 11 statements were accepted as successful outcomes and 14 statements were rejected as successful outcomes. The results suggest that successful outcomes of prosthesis use include when a person 'wears a prosthesis for specific activities', 'wears a prosthesis as often as they wish' and 'uses the prosthesis as intended'. In relation to 'activities and participation' accepted statements included that 'a successful outcome is a person's ability to perform their own personal care and activities of daily living without help from other people'. With regard to 'self-image', participants felt that a successful outcome included people not feeling self-conscious when in public with a prosthesis. **Conclusion.** The results of the present study challenge the notion that successful prosthesis use can be solely measured quantitatively through hours of use and that instead an individuals goals for their prosthesis need to be also taken into consideration both in an applied setting and in research studies aiming to identify the predictors of 'successful prosthesis use'.

Elderly patients with traumatic brain injury: specific considerations of rehabilitation

Z. Denes, P. Cserhati, G. Fazekas

National institute for Medical rehabilitation

Introduction. Younger age is the typical occurrence of traumatic brain injury. The incidence of traumatic brain injury in elderly people (older than 65 years), is lower. There are some differences during rehabilitation treatment between the two age groups caused by physiology of aging. The aim of this paper was to evaluate the data that had been collected from patients with traumatic brain injury older than 65 years. **Materials and methods.** Retrospective study in Brain Injury Rehabilitation unit between 2004. and 2008. During this 5 years period 178 patients (14%) was older than 65 years from the treated 1266 patients. Twenty patients suffered traumatic brain injury from the 178 patients, and 120 patients had stroke before the admission for rehabilitation. **Results.** Three percent of patients with traumatic brain injury were older than 65 years (20/667). The mean age of these patients was 73 years (range: 65-82 years). Mechanism of injury were: 4 falls on level ground, 4 falls from tree or stairs, 4 falls with bike or motorbike, 7 pedestrians hit by car, and 1 violence. Diagnoses of patients with brain injury were 11 cerebral contusions, 7 subdural hemorrhages, two skull fractures with impression. The mean length of first stay in rehabilitation unit was 54 (20-110) days. Co morbidities presented difficulties: three patients had severe arthritis, and other three cardiac problems. Complications were treated during rehabilitation: seven bed sores, two pneumonias, two urine infections, three septicemias, 1 heterotopic ossification, 1 hydrocephalus, 1 post traumatic epilepsy. At the time of admission the mean Barthel Index score was 25 (0 –80), and at the time of discharge 65 (0-100). **Conclusion.** Rehabilitation of elderly patients with brain injury has some specific considerations. Outcome is generally worse for older people than for younger people with similar injuries, but older individuals also need specific rehabilitation program to assist recovery.

References

1. Dénes Z: Immobilization syndrome. *Orvosi Hetilap* 1996;32:1739-1743.
2. Dénes Z: Rehabilitation results of persons with severe traumatic brain injury. *Orvosi Hetilap* 2005;47:2403-2406.

Is there a gender difference in our Cardiac Rehabilitation?

V. Santoro, M. Imbrenda, B. Lombardi

Hospital Misericordia e dolce USL 4 Prato, Tuscany, Italy

Introduction. We want to study patients accessing at our Cardiologic Rehabilitation (CR) program to know if is there is a gender difference. **Materials and methods.** We valuated adherence to drug therapy, presence of depression and anxiety using Zung rating scale(1-2) and cognitive problems using clock drawing test(3) and mini mental state evaluations (4); functional using 6 minutes walking test (6MWT)(5); SF36 (6) to test quality of live. 100 patient followed in our day service a CR program in 1 year. **Results.** Adherence to therapy: 92% of women and 86% of men. 20% of women and 13% of men had an anxiety disorder, 24% of women and 19% of men had a depression disorder. 32% women and 13% of men had cognitive problems. The 6MWT showing the follow results: TO: women: 285, men: 406; T1 (4 weeks): women: 345, men: 420; T2 (6 months): women: 438, men: 456. Quality of life was tested with SF 36: T0: women: 86; men: 90; T2 (6 month): women 102, men: 112. **Conclusion.** Women presented more anxiety and depression and cognitive problems than men. Women had an improvement in functional status and quality of life reaching similar goals of men although started from a minor score.

References

1. Zung A rating instrument for anxiety disorders. *Psychosomatics* 1971.
2. Zung A Self-Rating Depression Scale. *Arch. Gen. Psychiatry.*1965.
3. Richardson A comparison of scoring protocols on the clock drawing test in relation to ease of use diagnostic group, and correlations with Mini-Mental State Examination. *J Am Geriatr Soc.* 2002.
4. Cockrell, (1988). Mini-mental state examination. *Journal of Psychiatry Research.*
5. ATS Statement: Guidelines for the Six- Minute Walk test, *Am J Respir Crit Care Med,* 2002.
6. McHorney The MOS 36 Item Short Form Health Survey (SF 36): *Medical Care* 1994.

ICF data collection from patients in a rehabilitation unit after severe brain injury

C. Perin^{1,2}, F. Cantù^{1,2}, V. Rega², C. Cerri¹

¹University Milano Bicocca

²ICH Zucchi Carate Brianza

Introduction. We describe some problems encountered in a multicenter study on ICF(1) coding of patients admitted to rehabilitation facilities after severe brain lesions. Using the WHO September 2003 checklist it should be possible to get an almost complete picture of patients situation according to the biopsychosocial model. **Materials and methods.** 40 vegetative state subjects were assessed by ICF. **Results.** The correct recognition of items in Category B(impairment) for the mental state entries is particularly difficult in relation to the recognition of attention, emotional and perceptual functions definitions. Given the definition of impairment of body structure it is not possible reliably differentiate among brain lesion from axonal damage, cerebral hematoma or trauma, but this may be a minor problem because ICF is not supposed to be a substitute for ICD, which appropriately identifies distinct lesions. Chapter D(activities and participation) in our sample relies heavily on assistance provided to the patient to obtain the performance, thus also the competence qualifier is usually clueless in our patients. The environmental factors are indeed very useful in showing the social and community policy, personal relationship's and available technology, thus so we can get a quick understanding of the strengths and weaknesses of the structure where the patient is hospitalized. The data collection for this item seems to be without major problems, with modal mean score in our local sample of +2/+3. **Conclusion.** Correctly identifying the physical and functional impairments related items has some difficulty, probably because of expectation of a greater differentiation like that given by ICD. Furthermore in many severe brain injured patients some item too many times end up with the 8(unspecified) or 9(not applicable) specifier, nevertheless our overall experience with ICF coding is positive

References

1. WHO international classification of functioning, disability, and health 2001; Switzerland:Geneva 2006

Co-morbidity as predictor of functional rehabilitative outcome

R. Semprini, E. Palma, A. Alfano, P. Sale, A. Frustaci, M. Franceschini.

IRCCS San Raffaele Pisana Roma.

Several studies have recently tried to define which of demographic or clinical variables could influence the rehabilitative efficacy in elderly people. Many of these studies found a direct relationship between outcome and variables like age, mood disturbances, or functional status, leading to suggest for them a predictive value of functional outcome. Aim of this study is to define the impact of these variables (co-morbidity) on rehabilitative efficacy. **Materials and methods.** A retrospective population study on patients admitted between 2006 and 2009 in our Rehabilitative Unit was performed. Patients (n = 1196) for 41 % had orthopedic pathologies, for 44 % stroke, and for 15 % neurodegenerative diseases. CIRS was used for co-morbidity, FIM at admittance (FIM A) and dismissal (FIM D), period of bed (LOS), FIM Gain (FIM G) and the Montebello Rehabilitation Factor Score (MRFS e). Moreover, CIRS scores were used to subdivide patients in two groups with respectively low and high comorbidity rate. **Results.** At admittance CIRS score was 21,6± 3,27, FIM A was 63,81±24,6. FIM D was 93,47 ± 28,1. LOS was 54,4±26,4 days. CIRS and rehabilitative efficacy scores showed negative relationship between neurological, muscular-skeletal and cardiovascular diseases and rehabilitative efficacy as derived from FIM D (p< 0.001), FIM G (p< 0.01), and MRFS (p< 0.001). **Conclusion.** Our results suggest that co-morbidity may represent a predictive value of rehabilitative efficacy. CIRS score higher than 2 is often associated with low FIM Gain score which may predict the functional recovery and the efficacy of rehabilitative program.

References

1. Patrick, F. Knoefel, P. Gaskowski, D. Rexerth. 2001. Medical co-morbidity and rehabilitative efficiency in geriatric inpatients. *J Am Ger Soc* 49:1471-77.

Current stroke rehabilitation approaches are effective on motor recovery and functioning but not on spasticity after stroke: review of 5 rcts

G. Yavuzer, H.J. Stam

Erasmus University Erasmus MC, Department of Rehabilitation Medicine, The Netherlands.

Introduction. Motor weakness, poor motor control, and spasticity result in an altered gait pattern, poor balance, risk of falls, and increased energy expenditure during walking after stroke. Many traditional and new stroke rehabilitation approaches are used to improve motor recovery, spasticity and walking ability. **Materials and methods.** We retrospectively reviewed the results of 5 clinical intervention studies (neuromuscular electric stimulation (NMES, RCT, n=25), sensory-threshold electric stimulation (SES, RCT, n=30), balance training using force platform biofeedback (RCT, n=41), mirror therapy (RCT, n=36) and virtual rehabilitation (VR, RCT, n=20)) that were performed to improve selective motor control (Brunnstrom stages), tonus (Modified Ashworth Score) and motor functioning (motor items of Functional Independence Measure) of hemiparetic patients, 2-13 months after stroke. All patients participated in a conventional stroke rehabilitation program, 5 days a week, 2-5 hours/day, for 4 weeks. The NMES group received 10 minutes of NMES to the tibialis anterior muscle of the paretic limb. The SES group received 30 minutes of SES to the common peroneal nerve of the paretic leg. The balance group received 15 minutes of balance training. The mirror group received an additional 30 minutes of mirror therapy program consisting of non-paretic ankle dorsiflexion movements. The VR group received an additional 30 minutes of treatment with Playstation II EyeToy Games. **Results.** Between-group difference was significant for motor recovery and motor functioning in 3 of the 5 studies (balance training, mirror therapy and VR) in favor of experimental group however spasticity, evaluated in lower extremity by Modified Ashworth Scale, did not change at all. **Conclusion.** Electric stimulation, balance training, mirror therapy and virtual reality are effective on motor recovery and functioning but not on spasticity after stroke. We need impairment-focused treatments in addition to those task-specific, function-oriented interventions as they fail to improve spasticity alone.

Dramatic Response of the Frozen Shoulder to Acupuncture

Kaynoosh Homayouni¹, Abbas Alipour²

¹Assistant Professor of Physical Medicine & Rehabilitation, Department of Physical Medicine & Rehabilitation, Shiraz University of Medical Sciences, Shiraz, Iran.

²Resident in Epidemiology, Health and Nutrition Faculty, Shiraz University of Medical Sciences, Shiraz, Iran.

Introduction. The main problem in frozen shoulder is limitation of motion and acupuncture is an alternative treatment for it. **Materials and methods.** This study was a clinical trial on 14 patients with intractable frozen shoulder with severe limitation of motion. Acupuncture was done for them every other day for 10 sessions. Shoulder abduction was measured before, after 5th and 10th session of treatment. **Results.** There was significant effect of acupuncture on the degree of shoulder abduction over time [F (1.37, 16.46) =361.05; r= 0.98; P=0.0001]. Also the difference between pre treatment & post-treatment shoulder abduction was significant. **Conclusion.** Acupuncture is an effective and time saving method for treatment of limitation of motion in frozen shoulder.

References

Am J chin Med. 2006; 34(5):759-75.

Zhongguo Zhen Jiu. 2007 Nov; 27(11):857-8.

Progressive Multiple System Atrophy (MSA): preliminary proposal for rehabilitation

M. Scotti, A. Zancan, E. Morisani, S. Rossi, R. Mauri, I. Springhetti

U.O. di Recupero e Rieducazione Funzionale, sez. Riabilitazione Neuromotoria dir. I. Springhetti; IRCCS Fondazione Salvatore Maugeri, Istituto Scientifico di Pavia, Italy

Introduction. the study aims to evaluate the role of a rehabilitation program in a rare progressive neurological disorder: Multiple System Atrophy (MSA), characterized by a combination of parkinso-

nism (MSA-P), cerebellar (MSA-C), pyramidal signs, plus autonomic dysfunction. **Materials and methods.** The preliminary study involved a group of 11 patients in our department (6F, 5M) affected by MSA-P (7) and by MSA-C (4), average age 62,27±10 years. Three-phase study: admission, discharge, 4 months follow-up. The program uses 15 days postural and strenght training sets, based upon the following indicators: Balance Control Parameters: Neurocom Balance Master® reports, Berg Scale; ADL report: FIM score; Subjective parameters: Dizziness Handicap Inventory short form - DHIsf, Fall risk :Timed get up and go test – TuG. **Results.** 1) Balance improvement in all patients, but relevant individual variations. 2) Patients with gait difficulty improved more then others in TuG. 3) Possible ceiling effect in Berg Scale and TuG. 4) Benefits are partially maintained at 4-month follow-up. **Conclusion.** Despite the small group of patients, the following conclusions are possible. The most improvement involves the most compromised patients (TuG), with specific improvement in transfers and possible reduced risk of falling during everyday living. Less compromised patients improve in posture and gait quality and confidence. Finally, it seems relevant to associate instrumental and manual assisted exercise inside the rehab training protocols. For thus, further studies have been started.

References

Gilman S et al. Consensus statement on the diagnosis of multiple system atrophy. J Neurol Sci 1999; 163:94-8.

Geser F et al. Progression of Multiple System Atrophy (MSA): a prospective natural history study by the European MSA study group (EMSA SG). Mov Disord 2006; 21:179-186.

Nashner LM: Balance Master® Systems: summary of key findings in the literature. Clackawas, OR, Neurocom® International, Inc., 1996,

Effects of upper extremity motor recovery on gait pattern late after stroke

G. Yavuzer

Erasmus University Erasmus MC, Department of Rehabilitation Medicine, The Netherlands.

Introduction. Stroke patients exhibit varying deficits in perception, muscle strength, motor control, passive mobility, sensation, tone and balance. These impairments have significant effects upon walking ability. Although their association with hemiplegic gait have extensively studied, data regarding the effects of upper limb on gait pattern is scarce. The aim of this study was to investigate the effects of upper limb motor recovery stage on gait pattern late after stroke. **Materials and methods.** Spatio-temporal, kinematic and kinetic characteristics of gait in total of 52 patients (mean (SD) age of 60.9(12.1) years, 30 men, median time since stroke 6 months, 31 with left side paresis) with hemiparesis after stroke were retrospectively evaluated. Upper limb motor recovery was evaluated by Brunnstrom Motor Recovery Stage (BMRS) as it reflects underlying motor control based on clinical assessment of movement quality. **Results.** Median BMRS of the group was 3 (2–5). Upper limb motor recovery stage was significantly correlated with walking velocity (rho = 0.41), pelvic excursions in sagittal (rho = -0.49), frontal (rho = -0.62) and transverse (rh = -0.42) planes as well as hip flexion in swing (rho = 0.45), ankle plantar flexor moment (rho = 0.38) and first peak of vertical ground reaction force (rho = 0.48). **Conclusion.** Better motor recovery at the paretic upper limb after stroke was associated with faster walking velocity, more hip flexion in swing, symmetry in weight-bearing, better push-off and less necessity to compensatory pelvic movements. Gait pattern after stroke is associated with motor recovery stage of the paretic upper limb so that interventions and gait training should focus not only at the lower limb but upper limb as well.

Effects of Hyperbaric Oxygen Therapy (HBOT) on patients with peripheral arterial disease

Z. Damnjanovic, R. Kostic, D. Rondovic, D. Vujnovic

Special hospital for rehabilitation “Gamzigrad” Gamzigrad Spa

Introduction. Peripheral arterial disease (PAD)-related exertional leg pain may limit physical activity, thereby contributing to mobility loss and increasing cardiovascular morbidity and mortality in men and women with PAD. PAD patients have decreased functional status lower extremity than non-PAD persons.¹ **Materials and methods.** Prospective clinical research of the 26 patients on stationary rehabilitating in Rehabilitation Center “Gamzigrad”. All of the patient were in second stage of the disease by Fontain , with ASPI

less than 0.90. All examined patients were treated with the same therapy protocol (10 HBO treatments, under pressure of 1.7-2.2 bar, in duration of 60 minutes). The therapy was provided in monoplace oxygen hyperbaric chamber. Before the treatment and also after the therapy, there was some functional measurement: walk on 30m long track in 6 min., time needed for 5 continuous stand up of the chair, possibility of standing balance in 10 sec., speed on 4 m at normal and fastest walk. **Results.** All results are processed with Wilcoxon test and there was significant difference in functional measurements before and after the treatment. **Conclusion.** Using the HBOT improve functional capacity of PAD disease gives better quality of life to the patient².

References

1. McDermott MM; Liu K; Greenland P; Guralnik JM; Criqui MH; Chan C et al; Functional decline in peripheral arterial disease: associations with the ankle brachial index and leg symptoms. *JAMA* 2004 Jul 28;292(4):453-61.
2. Tepić S, Zivković M, Terzić N, Krivokuća R. Effect of hyperbaric oxygen treatment on oxidative stress in patients having diabetes mellitus type 2. *Med Pregl.* 2009 May-Jun;62(5-6):225-30.

Case report: Using Botulinum toxin in Von Hippel-Lindau

G. Ianieri, R. Marvulli, S. Altini, G. Tondi, L. Mastromauro, M. Ranieri, G. Megna

Neurological and Psychiatric Sciences Department, Physical Medicine and Rehabilitation University of Bari, Italy

Introduction. Von Hippel-Lindau (VHL) syndrome is a rare hereditary pathology with autosomal dominant transmission that predisposes patients to angiomas and retinal hemangioblastomas onset and to visceral tumors such as cysts and liver, pancreas, adrenals and epididymis neoplasms. **Materials and methods.** 36 years old young man suffering from Von Hippel-Lindau syndrome with D9-D11 spinal hemangioma and with overlying and underlying cystic cavitations (pseudosyringomyelia), operated in March 2007 and arrived in our operative unit at the botulinum toxin clinic for spastic paraparesis with hypertonicity of surae triceps and adductor. The patient also complained of moderate pain as assessed by VAS. The patient underwent psychiatric assessment and functional balance, spasticity assessment by using the Ashworth scale and myometric measurement before and after botulinum toxin infiltration. Was used botulinum toxin type A for all three infiltration cycles. **Results.** Data were analyzed using statistical methods with the paired Student t-test, except where noted, all are expressed as mean and SD. The score on the Ashworth scale increased from 2.75 ± 0.72 to 1.52 ± 0.66; according to myometric assessment, the tone has varied from 16.41 to 14.98, elasticity from 1.12 to 0.98 and stiffness from 308.73 to 265.46 with p < 0.001. **Conclusion.** The treatment has promoted: a reduction of muscle tone ,an improvement in joint mobility, improvement of gait and stability, with an improvement in postural steps.

References

Intramedullary tumors. Results of a national investigation in private neurosurgery Adam Y, Benezech J, Blanquet A, et al. *Neurochirurgie.* 2010 Jan 22.

Disseminated hemangioblastomatosis of the central nervous system without von Hippel-Lindau disease: a case report. Kim HR, Suh YL, Kim JW, Lee JI. *J Korean Med Sci.* 2009 Aug;24(4):755-9. Epub 2009 Jul 30.

Spinal cord injuries. Neurological sequelae and complications Levi R, Ahuja S. *Lakartidningen.* 2009 Mar 11-17;106(11):768-71.

Predictive value of effect muscle electrostimulation and physiotherapy in the childhood flat foot

M. Ranieri, M. Sciuscio, S. Mennuni, R. Marvulli, A. Camporeale, D. Vittore, G. Megna

Introduction. Childhood flexible flat foot is the most common paramorphism of the lower limb. Functional deficiency of the muscles that support the arch causes the medial longitudinal arch. **Materials and methods.** Our study provides the recruitment of young patients with flat feet classified by the degree of severity of flat foot found by the Viladot method and through the static and dynamic baropodometric platform. The enlisted group was also processed to surface EMG. The first group, consisting of eight subjects, (3 women and 5 men) with a mean age of 6 years (between 3 and 10) was processed to a program FKT dedicated and selective electrostimulation. The second group, consisting of six subjects, was treated with KT passive of foot and ankle. Both groups were provided with push elastic medial plantar (plantare SEM). **Results.**

Significant improvements of data of sEMG, Viladot method and static and dynamic baropodometric platform is noted in the first group instead in the second one. **Conclusion.** The data emerging from preliminary evaluations of sEMG point out that the reduced activation of studied muscles in certain subjects, may be involved in determining the infant and flat foot and as selective enhancement of those obtained by FKT enable the achievement of results statistically more significant in the first group compared to the second subject exclusively to KT.

References

1. D. Vittore, L. Molfetta, O. Recchia, A. Sgura. Considerations about the function of muscles in the mechanical balance of plantar arch. *Chir. Del Piede,* 8, 1984
2. Carlo J. De Luca. The use of surface electromyography in biomechanics. *The International Society for Biomechanics,* 5 July 1993
3. Beck RB, O'Malley MJ, Stegeman DF, Houtman CJ, Connolly S, Zwartz MJ Tracking motor unit action potentials in the tibialis anterior during fatigue. *Muscle Nerve.* 2005 Oct;32(4):506-14.
4. Vittore D, Patella V, Petrera M, Caizzi G, Ranieri M, Putignano P, Spinarelli A. Extensor deficiency: first cause of childhood flexible flat foot. *Orthopedics.* 2009 Jan;32(1):28.

Evaluation of the effectiveness of the treatment of the plantar fasciitis and the hell-bone spur with extracorporeal shockwave therapy (ESWT) through baropodometric analysis

A. Zambuto, D. Giglio, G. Pancucci

U.O. Complessa di Medicina Fisica e Riabilitativa, Azienda Sanitaria Provinciale di Agrigento, Distretto AG1, Ospedale "S. Giovanni di Dio"

Introduction. Today the more diffused heel pathologies are the plantar fasciitis and the hell-bone spur. The first one is referred to an inflammatory process of the so-called arcuate ligament. It's due to a microtraumatism repeated in the fitting of the plantar band with resulting periosteum inflammation by traction and microlacerations at the hell-bone insertion level. The second one regards a bony formation as a spur that stretches forward the toes beginning from the medial process of one or of the two heel-bones. **Materials and methods.** Fifty patients, aged from 30 to 75 years, male and female, have been analyzed. They all suffered of plantar fasciitis and hell-bone spur as monolateral as bilateral. The procedure was based in ten treatments of 200 hits each with ESWT with a break of fifteen days between a treatment and another. The results have been estimated according to a VAS scale before and after a post-treatment and by a baropodometric analysis carried out at the beginning and at the end of the treatment. **Results.** The results which have been obtained, according to S.I.T.O. D. classification, have been : very good at the percentage of 55,30%, good at the percentage of 23,70%, sufficient at the percentage of 15,80% and insufficient at the percentage of 5,20%. **Conclusion.** The non-invasive action, its analgesia and the maintenance in time of the results estimate the conclusion that the action is useful to the patients with heel pathologies beginning as the first treatment by utilizing the ESWT.

The Nd:YAG laser e its applications in rehabilitation: our clinical experiences

A. Zambuto, D. Giglio, G. Pancucci

U.O. Complessa di Medicina Fisica e Riabilitativa, Azienda Sanitaria Provinciale di Agrigento, Distretto AG1, Ospedale "S. Giovanni di Dio".

Introduction. The Nd:YAG laser is a laser at solid state and at high energy whose active material is constituted by a Yttrium Aluminium garnet, spiced by a small percentage of Neodimio. The Nd:YAG laser results particularly efficient in the lesions of muscles, of tendons and of ligaments, both in acute pain and in chronic pain. **Materials and methods.** Our study has been conducted on 100 patients, male and female, aged from 25 to 75 years, in daily therapy with Nd:YAG laser for a total of ten sessions and with different settings according to the type of pathology and to the treatment on district bodily party. The criteria of exclusion from the study concerned: pharmacological or physical therapy in action, tumors, pregnancy, the areas of hemorrhage in the center of treatment, the epilepsy, the treatment on infected zones, the treatment on the autonomic nervous system, patients with cardiac diseases, the treatment on photosensitive subjects. The results have been valued through clinical

cal examination, evaluation scale of the pain, functional evaluation scale, techniques of imaging, everything effected both in pre and in post-treatment. **Results.** The results, which have been obtained, have been: very good at the percentage of 63,30%, good at the percentage of 23,20%, sufficient at the percentage of 7,40% and insufficient at the percentage of 6,10%. **Conclusion.** The non-invasive and short action together with its analgesia and the maintenance in time of the reached results brings us to the conclusion that the Nd:YAG laser is a reliable, effective and decisive therapy.

References

Castellacci E, Ciuti F., Di Domenica F. Il Nd:YAG e la Terapia Laser ad alta energia. Conforti M. Edizioni Martina Bologna
 Mele G, Pedersoli G, Di Domenica F. The use of high power laser (Nd-Yag) in the osteoarticular pathology: our experience. Laser and Tecnology. Clinical and experimental vol 10 n°3, 2000.

The effect of repetitive transcranial magnetic stimulation on chronic stroke patients in regard to brain reorganization, clinical status and electrophysiological parameters

Engin Cakar¹, Gulseren Akyuz², Onur Ozyurt³, Onur Sildiroglu⁴, Aykut Aytekin⁴, Hakan Mutlu⁴, Cengizhan Ozturk³, Mehmet Zeki Kiralp¹

¹GATA Haydarpaşa Training Hospital, Department of PMR
²Marmara University, School of Medicine, Department of PMR
³Bogazici University, Biomedical Engineering Institute
⁴GATA Haydarpaşa Training Hospital, Department of Radiology

Introduction. The objective of this study was to investigate the effects of repetitive TMS (rTMS) on reorganization and on clinical and electrophysiological parameters, and also to analyze prognostic value of electrophysiological parameters. **Materials and methods.** Twenty patients were randomized to two groups (12 real rTMS, 8 sham rTMS) and rTMS was applied to real group for five consecutive days (1 Hz, %90 rMT, 20 minute [1200 trains], with using MagVenture MagPro X100 with option, and MMC 140 parabolic). Brunnstrom motor staging, Ashworth scale, Motricity index, finger tapping, motor activity log-28, motor evoked potential (MEP) latency, amplitude, resting motor threshold (rMT), central motor conduction time (CMCT) and fMRG were used for the assessment and follow-up. The assessments were performed at baseline, at the end and one week later. **Results.** There were significant improvements in both of the groups in regard to functional indexes and electrophysiological parameters. Although the real groups scores were better in general, it was reached level of significance at only Brunnstrom upper extremity stage (p=0,02). It was noticable that the significant decrease in spasticity according to baseline was observed only in the real group (p<0,05). Additionally, rMT for spasticity and CMCT for motor improvement were found as hopeful parameters for prognosis determination. The fMRG lateralization index was changed from 0,27 to -0,48 in real rTMS group which indicated the supression of the intact hemispheres. **Conclusion.** The rTMS application at low frequency and low intensity to the unaffected hemisphere of the chronic post-stroke patients with parabolic coil seemed to be as an effective therapeutic approach especially in regard to motor function. Finally, it was considered that TMS and rTMS applications will continue to attract the attentions as a novel therapeutic approach for stroke rehabilitation.

Gait improvement with an orthotic insole in a patient with post-trauma limb-length inequality – case report

S. Paradinha¹, A. Camões¹, C. Rito¹, J. Jacinto²

¹PMR Resident
²PMR Specialist
 Centro de Medicina de Reabilitação de Alcoitão

Introduction. Limb-length inequality (LLI) is commonly associated with compensatory gait abnormalities, resulting in secondary syndromes^{1,2,3}. The correction of LLI with insoles is widely used^{1,3}, although there are few studies demonstrating objective benefits¹. This study aims to measure these effects through Gait Analysis and Baropodography, in a patient with post-traumatic LLI. **Materials and methods.** Male, aged 27, motorcycle accident survivor, with multi-level fractures in right lower limb (RLL). Surgically treated. RLL radiographically 9mm shorter. Patient evaluated in the gait laboratory with and without LLI compensation. **Results.** Orthostatic posi-

tion: relative rise of the left pelvis; hips and knees flexed, ankles dorsiflexed (left more than right). Longitudinal parameters of gait within normal. Static baropodography: pressures concentrating at the forefoot on the RLL, normal distribution on the left. Dynamic baropodography: abnormal progression of centre of pressure on the left, starting at the head of the 5th metatarsal, backwards to the mid-foot, then forward, towards the 1st toe. Being normal on the left. Fz GRF without both peaks during right stance, but normal on the left; flatter curve of ankle dorsiflexion moment on the RLL; ankle power comparatively reduced on the RLL. All asymmetries were markedly reduced when the patient wore an 8mm insole in his right shoe. **Conclusion.** The gait laboratory measured the effects of an intervention, which had an immediate positive impact and will probably prevent future complications, in the case studied.

References

1. Schuit D et al. Effect of heel lifts on ground reaction force patterns in subjects with structural leg-length discrepancies. PhysTher 1989;69:663-670.
 2. Brady RJ et al. Limb length inequality: clinical implications for assessment and intervention. J Orthop Sports Phys Ther2003;33:221-234.
 3. Defrin, R et al. Conservative correction of leg-length discrepancies of 10mm or less for the relief of chronic low back pain. Arch Phys Med Rehabil 2005;86:2075-80.

A rehabilitation program for people with fibromyalgia

A.C. Sousa, M.L. Rosado, A.R. Henriques, M.J. Resende, Jesus, Áurea Psycho, M.J. Lalanda

Centro de Medicina de Reabilitação de Alcoitão – Alcoitão-Portugal

Objectives. To evaluate the impact of a rehabilitation program for fibromyalgia's patients. **Materials and methods.** A rehabilitation multidisciplinary program for people with fibromyalgia was created in our centre based on education, exercise (10 sessions of hydrotherapy and 3 sessions of low-impact exercise) and relaxation. The main goal was to promote self-management that means that after the program the people with fibromyalgia should have the ability to cope with and manage the symptoms in a way that enhances functioning and quality of life. From September 2006 to December 2007, ninety-eight people with fibromyalgia participated in this program and fulfilled the assessment battery. The assessment was made by Fibromyalgia Impact Questionnaire (Portuguese version) (FIQ-P); a depression inquiry: the Inventory of Clinical Evaluation of the Depression (IACLIDE) and the short-form 36 health survey (SF-36v-2) in the beginning and end of the intervention, at six months and one year. **Results.** The scores of FIQ-P and IACLIDE improved at the end of the program (p<0,005). The SF-36 showed statistical differences at beginning and end of the program in physical functioning, vitality, role-emotional and reported health transition (p<0,005). At six months and one year these results were worst. **Conclusion.** This is a good rehabilitation program for people with fibromyalgia, but we must enhance the importance of the self-management for its success in a long-term.

References

Fibromyalgia: a randomised, controlled trial of a treatment programme based on self management.
 Cedraschi C, Desmeules J, Rapiti E, Baumgartner E, Cohen P, Finckh A, Allaz AF, Vischer TL ; Ann Rheuma Dis 2004 Mar, 63(3): 290-6

The Correlation between Ultrasonographic Semiquantitative Evaluation on Severity of Knee Osteoarthritis and Clinical Status

Chia-Ling Lee^{1,2,3}, M.S. Jiing-Yuan Su^{4,5}, Chia-Hsin Chen^{2,3}, Tien Wen Chen², Mao-Hsiung Huang^{2,3}

¹Department of Physical Medicine and Rehabilitation, Kaohsiung Municipal Hsiaokang Hospital, Kaohsiung, Taiwan
²Department of Physical Medicine and Rehabilitation, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan
³Department of Physical Medicine and Rehabilitation, Faculty of Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan
⁴Department of Orthopedic Surgery, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan
⁵Department of Orthopedic Surgery, Faculty of Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Introduction. Ultrasonography (US) was reported to be a tool to evaluate knee joint cartilage. Many studies on qualitative analysis were reported¹. We had developed a US semiquantitative grading

system, which included three important parameters. Examinations on reliability and validity were also done^{2,3}. In this study, we aimed to investigate the correlation between ultrasonographic (US) semi-quantitative grading on severity of knee osteoarthritis (OA) and clinical severity status. **Materials and methods.** We recruited 66 patients going to receive total knee arthroplasty due to knee OA for the first time as study group and 27 healthy young subjects without any knee complaints as control group. The operated knees of the study group were classified as group A knee, the nonoperated knee of the study group as group B knee, and bilateral knees of the control group as group C knee. Each knee received US evaluation for semi-quantitative grading for the severity of knee OA. ANOVA was used to analyze the difference of US grading among the three groups. **Results.** We found there is significant difference among three groups in US grading on overall joint, medial femoral condyle and lateral femoral condyle (all Ps < 0.0001). There is significant difference between group C and group A or B in US grading on all three evaluation (all Ps < 0.0001). There is significant difference between group A and group B in US grading on overall joint and medial femoral condyle (P=0.0129, 0.0010), but not on lateral femoral condyle (P=0.1067). **Conclusion.** There is significant correlation between US semi-quantitative evaluation on severity of knee osteoarthritis and clinical status. It implied that the semi-quantitative US grading could differentiate clinically different severity of knee OA.

References

1. Grassi W, Lamanna G, Farina A, Cervini C. Sonographic imaging of normal and osteoarthritic cartilage. *Seminars in Arthritis and Rheumatism* 1999;28(6):398-403.
2. Tsai CY, Lee CL, Chai CY, Chen CH, Su JY, Huang HT, et al. The validity of in vitro ultrasonographic grading of osteoarthritic femoral condylar cartilage - a comparison with histologic grading. *Osteoarthritis and Cartilage* 2007;15(3):245-50.
3. Lee CL, Huang MH, Chai CY, Chen CH, Su JY, Tien YC. The validity of in vivo ultrasonographic grading of osteoarthritic femoral condylar cartilage: a comparison with in vitro ultrasonographic and histologic gradings. *Osteoarthritis and Cartilage* 2008;16:352-8.

Functional evaluation in knee osteoarthritis

C. Cuenca-González, F. Pascual-Gómez, K.V. Méndez-Saavedra, I. Barca-Fernández, I. Flores-Torres, M. Archanco Olcese, C. Hernández De la Peña

Physical Medicine and Rehabilitation Department, Clinico San Carlos Hospital. Madrid, Spain.

Introduction. Gonarthrosis is the main cause of knee pain in adults over 50 years old and it is the most common location of osteoarthritis. There are several risk factors associated with this entity. Knowledge is essential in the progression of this disease. **Materials and methods.** Cross sectional descriptive study. Sample of 19 patients with gonarthrosis evaluated before and after rehabilitation program. Variables: age, sex, occupational joint risk, mood disorders, medication, sports performance, clinical presentation (pain, heat, swelling, cracking, stiffness and insecurity), pain assessment through VAS, KSS scale and functional evaluation (Lequesne and WOMAC). The treatment consisted in therapeutic exercises, hygienic-postural advice, electrotherapy and hydrokinesitherapy. **Results.** We included 19 patients, 18 women and 1 man, mean age 66.84 (+4.2). None of them suffered mood disorders 84.21% (medium risk), 10.52% (low risk) 5.26% (high risk). 94.73% of them were taking NSAID. Only 36.84% were under previous rehabilitation treatment. The most common symptoms: pain (94.73%), crunch (63.15%) and insecurity (68.42%). At the end of the treatment the mean VAS scale decreased 3.73 and 1.63 in the KSS, functional index of Lequesne decreased 3.53 and WOMAC test for pain, stiffness and functional ability decreased in 8.73. All of them were statistically significant (p <= 0.05). **Conclusion.** Our results correlate with the epidemiological data collected in the literature. With the rehabilitation program our patients had a significant improvement of to pain and functionality.

References

1. Basas García, A, et al. Tratamiento fisioterápico de la rodilla. Madrid, McGraw-Hill / InterAmericana, 2003.
2. Documentos SER de revisión de evidencia científica. Artritis. Sociedad Española de Reumatología. Editorial Panamericana; 2005.
3. Christensen R, et al. Effect of Weight Reduction in Obese Patients Diagnosed with Knee Osteoarthritis: A Systematic Review and Metaanalysis. *Ann Rheum Dis.* 2007, April; 66: 433-439.

The impact of exercise training on quality of life in hypertensive patients

S. Iurciuc¹, M. Iurciuc¹, L. Craciun¹, C. Avram², A. Avram¹, G. Gojka¹, S. Ursoniu¹, D. Berceanu-Vadua¹, D. Gaita¹, Silvia Mancas¹

¹University of Medicine and Pharmacy Timisoara

²West University Timisoara

Introduction. Our goal is to demonstrate that cardiac rehabilitation improves the quality of life and some cardiovascular parameter measured through standard tests (questioners) ¹ at hypertensive patients. **Materials and methods.** The study batch includes recently detected hypertensive 193 patients (90 male and 103 female). Average patient's age is: 50±12,5 years. These patients had been divided in two batches that present similar characteristics: Batch A of physical training: 102 trained patients (over 5 METS daily); Control Batch B: 91 sedentary patients, patients that had not been following any training program (below 5 METS daily). Before and after 4 months all patients had been evaluated: clinically, paraclinically² and through HAD scale. **Results.** For batch A, where patients had undergone standard physical training, results were better related to anxiety, which decreased with 33% from the initial momentum (p0,031), while for batch B, of untrained patients, it appeared only a 21,5 % decrease (statistically insignificant p value). Batch A presented a mental state improvement per depression parameter with a percentage of 57,3% (p<0,001), while for Batch B the improvement was done in a percentage of 25% (p0,023). **Conclusion.** Physical training and lifestyle change has beneficial action upon hypertensive patients' mental state, improving the studied parameters, more for depression and less for anxiety. Favorable evolution of the studied parameters: anxiety and depression were present also within batch B patients (untrained) at statistically lower values than patients from batch A, fact that may be explained by initiating a lifestyle change under Guidelines and disease awareness by the patient, acting in a beneficial manner upon their mental state. Patients' illness perception, for the persons that benefited by a standard, individualized physical training program and supervision is in a lesser degree that for sedentary patients.

References

1. GRADE Working-Group. *BMJ* 2004;328: 1490-1497.
2. ESC/ESH Guideline 2007.

Orthopedic surgery and ambulation in boys with Duchenne muscular dystrophy: Five year retrospective review

Morozova Olga, Duong, Trinh

Introduction. Duchenne Muscular Dystrophy (DMD) is the most common progressive childhood neuromuscular disorder. Children become non-ambulatory at approximately 10 years of age.⁴ Joint contractures occur due to decreased strength, static positioning of a joint, muscle imbalance, and fibrotic changes in the muscle.²⁻⁴ Surgical interventions, stretching, and splinting are used for contracture management in hopes of prolonging ambulation.¹ Assessing the effectiveness of surgical interventions is important in the management of boys with DMD. **Materials and methods.** A retrospective quasi-experimental review of 140 medical records of boys with DMD. Eighteen boys met inclusion criteria with a comparison group of similar age and demographics. Assessments included ambulation, range of motion and orthoses. **Results.** Over a 5-year period, 13% of the patients elected surgical interventions to improve range of motion for ambulation, decrease pain or improve standing. Half of patients (n=9) who elected surgery were non-ambulatory. Ambulation cessation within one-year post surgery was 78%. Range of motion was improved for most of participants after surgery but no clear evidence. Future analysis will include data from the non-surgical group. **Conclusion.** Our data showed that surgical interventions in the middle ambulatory to early non ambulatory phase did not prolong or help regain ambulation in boys with DMD.

References

1. Bushby K et al. Diagnosis and management of Duchenne muscular dystrophy, part 2: implementation of multidisciplinary care. Retrieved on Jan 18, 2010 www.thelancet.com/neurology Publ. online Nov 30, 2009 DOI:10.1016/S1474-4422(09)70271-6.
2. Johnson ER et al. Contractures in neuromuscular diseases. *Duchenne muscular dystrophy.* *Am J. Phys Med Rehab* 1992;73:807-810.
3. McDonald CM. Limb contractures in progressive neuromuscular disease and the role of stretching, orthotics, and surgery. *Phys Med Rehab Clin N Am* 1998; 9: 187-211.
4. Mendell, J.R., et al. Clinical investigation of Duchenne muscular dystrophy. A methodology for therapeutic trials based on natural history controls. *Arch Neurol.* 1987; 44(8): p. 808-11.

Test Results Showing Bench Reliability on Catheter Dislodgement for Ascenda™, Medtronic Neuromodulation's Next-Generation Catheter

K. Hokanson¹, M. Metzler², J. Kopp³, A. Servi⁴, A. Gjoraas⁵

¹Program Manager;

²Principal Mechanical Design Engineer;

³Reliability Engineer;

⁴Sr. Test Development Engineer;

⁵Mechanical Design Engineer; Medtronic Neuromodulation, Minneapolis, Minnesota, USA

Introduction. A next-generation catheter (Ascenda™) was recently developed for a programmable, implanted infusion system that administers drugs to the intrathecal space. Our program evaluated several known failure modes for catheter dislodgement, which can occur even when an anchor is sutured to the site where the catheter exits the fascia. The catheter can migrate distal to the anchor due to a "sweeping motion" between skin and fascia, or proximal to the anchor due to tensile forces from body motion. **Materials and methods.** To evaluate catheter dislodgement due to a "sweeping motion" between the skin and fascia, an anchored catheter was exposed to oscillatory force of 0.70 lbf, perpendicular to the catheter axis. The anchored catheter was exposed to this force for a minimum of 120,450 cycles, based on a study evaluating activities of daily living and the number of cycles these activities could impart in one year (the timeframe within which dislodgement distal to the anchor is expected to occur). To evaluate catheter migration and cyclic axial fatigue performance due to tensile stresses from body motion proximal to the anchor, the catheter anchor was exposed to a cyclic axial fatigue test for a minimum of 850,000 cycles at a displacement of 0.27" (derived from human studies evaluating the maximum displacement of the catheter due to activities of daily living). **Results.** During attempted dislodgement, the catheter withstood 250,000 cycles (more than twice the requirement) without displacement of the anchor. During tensile cyclic fatigue exposure, the catheter withstood 1,700,000 cycles (twice the requirement) without catheter movement relative to the anchor. **Conclusion.** These bench test results illustrate the robustness of the catheter with respect to dislodgement, above and beyond established design requirements. When considered collectively, these results provide evidence of a highly reliable and robust catheter design.

Lymphedema patient management along the life

S. Michellini, A. Failla, G. Moneta, M. Cardone, F. Cappellino, A. Santoro
San Giovanni Battista Hospital, ACISMOM, Rome, Italy.

Introduction. Lymphedema is a serious discomfort pathology and as such it will be many strategies to look for improving the quality of life patients. PCDT has been applying for a long time successfully; LMD, skin care, elastocompression and physical exercises are irreplaceable elements of the rehabilitative training in lymphedema treatment. It's also useful to propose some treatments for the proprioceptive mechanism recovery and some specific movements of the principal limb articulations. **Materials and methods.** We have studied 136 patients – 91 females 45 males – age from 21 to 81 years, who presented primary or secondary limbs. All patients underwent a clinical examination (limbs circumference – body weight – muscular exam), lymphoscintigraphy, CT, laser Doppler exam. All patients started a tailored rehabilitative protocol for 3 months (drugs, M.L.D., pressotherapy, elastocompression, ventilatory and isotonic gymnastic, psychological evaluation, behavioural rules). **Results.** At the end of treatment all the subjects showed an evidence reduction of limb circumference (between 10% and 30% above all at II and III clinical stage), 8 patients dropped the treatment. **Conclusion.** It's necessary so to personalize the treatment in function of the patient's needs and of his capacity to interact with the equipment.

References

- ISL: The diagnosis and treatment of peripheral lymphedema. Consensus document of International Society of Lymphology. *Lymphology*, 2002; 28: 113-117.
Basaglia N.: Progettare la riabilitazione. Il lavoro in Team interprofessionale. Edi-ermes, 2002.

The utilization of robotic devices in the rehabilitation of arm function after a stroke: analysis of tests with ARMEO

V. Leoni, M.L. Calamari.

ASL 4 Chiavarese, Ospedale di Sestri Levante, SC Medicina Fisica e Riabilitativa

Introduction. The purpose of this study is to analyze the effectiveness and benefits of ARMEO in the rehabilitation of the paretic arm, assessing the robotic therapy as a support to traditional rehabilitation. **Materials and methods.** ARMEO is a device composed of a non-motorized exoskeleton which, due to a system of springs, allows a wide range of tri-dimensional movement with static compensation of gravity. Five patients have been treated after a stroke: 2 in post-acute phase and 3 in a chronic phase. Each patient carried out five sessions a week for a month; they had been evaluated at the beginning and at the end of the rehabilitative cycle with the following units of scale and tests: Fugl-Meyer Scale, Motricity Index for upper limb, Ashworth Scale, Box and Block test, FIM, and TUG test. A follow-up evaluation, 6 months from the treatment, is being planned. **Results.** We have found an increment in the points referred to the proximal region of the arm in post-acute patients and in a chronic patient presenting the learned non-use phenomena. However, there were no significant improvements in the chronic patients who showed active movements in gravity contrast and a frequently utilized of the arm, even by means of compensating strategies. **Conclusion.** Due to the diversity of results within the sample group of patients, it is evident that strictly necessary attention must be paid when the selection is being made in order for ARMEO treatment. The device has shown evidence of usefulness in directing and incentivating movement of patients in the post-acute phase, and furthermore, it resulted efficient for patients in the chronic phase who showed a certain amount of movement in the absence of gravity, that was, however, too weak to utilize the affected arm in a functional manner.

Rehabilitation in cancer patients in a Day Care Center

M. Zheleva¹, E. Nikolova²

¹Clinic of Physical Medicine and Rehabilitation to National Cancer Hospital, Sofia

²Southwestern University, Department of Physiotherapy, FTTS Faith, Hope, Love "Blagoevgrad

Rehabilitation is especially important for patients who have undergone radical treatment in cancer occasion. It takes place after a period of active surgical treatment, chemotherapy and radiotherapy. Cancer Rehabilitation Program is based on an interdisciplinary approach and includes consultations with physicians, oncologists, surgeons, physical medicine and rehabilitation specialists in nutrition, psychology and social workers. They create an individual program for each patient. Its strength depends on the following factors: Sex; Age; Tumour localization; Stage of disease; The treatment; General condition of the patient; Occupation; Occupational orientation. Accuracy of the day care center for cancer patients is to provide support and rehabilitation and social integration of people with disabilities as a result of cancer.

Predictors of treatment outcome in patients with chronic low back pain undergoing spinal manipulation, individual physiotherapy or back school

F. Cecchi¹, S. Negrini², F. Zaina², G. Pasquini¹, A. Paperini¹, A.A. Conti¹, C. Macchi¹, R. Molino-Lova¹

¹Fondazione Don Gnocchi, Scientific Institute, Florence, Italy

²ISICO (Italian Scientific Spine Institute), Milan, Italy

Introduction. Prognosis of chronic low back pain is generally described as poor despite evidence-based treatment. We aimed at identifying predictors of response to treatment in a sample of 210 patients randomly assigned to either spinal manipulation (SM), back school (BS) or individual physiotherapy (IP). **Materials and methods.** Roland Morris Disability Questionnaire (RM) and Pain Rating Scale before/after treatment were assessed: those who decreased their RM score ≥ 2.5 were considered responders. Baseline potential predictors included demographics and clinical data. **Results.** Non-responders were 72 (34,2%). SM showed the lowest rate of

non-responders. In the multivariable backward logistic regression predicting the probability of non-response, a lower baseline RM score (OR 0.82, 95% CI 0.76-0.89, $p < 0.001$) and the received treatment (OR 0.32, 95% CI 0.21-0.50, $p < 0.001$) were independent predictors. A model of interaction terms showed an highest interaction between non-responders and BS in 1st tertile of RM score, and a lowest in SM in all tertiles. Compared with 1st tertile, higher RM score showed significantly lower frequency of non-responders. **Conclusion.** A low RM score predicts non-response to BS and IP, but not to SM. Patients in the lowest tertile of baseline RM score were more likely to respond if they received SM treatment.

References

Cecchi F, Molino-Lova R, Chiti M et al. Spinal manipulation compared with back school and with individually delivered physiotherapy for the treatment of chronic low back pain: a randomized trial with one-year follow-up. *Clin Rehabil.* 2010 Jan;24(1):26-36. PubMed PMID: 20053720.
 Underwood M, Morton V, Farrin A. Do baseline characteristics predict response to treatment for low back pain? Secondary analysis of the UK BEAM dataset. *Rheumatology* 2007;46:1297-1302.
 Kovacs M, Abreira V, Royuela A et al. Minimal clinically important change for pain intensity and disability in patients with nonspecific low back pain. *Spine* 2007;32:2915-2920.

Two year follow-up of outcomes of conservative treatment package for surgical candidates with lumbar disc herniation

Youngkwon Choi¹, Joonshik Shin², Yousuk Youn², Sangho Lee²
¹Dept. of Physical medicine and Rehabilitation, Jaseng medical foundation
²Jaseng Hospital of Oriental medicine, Seoul, Republic of Korea

Introduction. The purpose of this prospective observational cohort study was to prove the effectiveness of the integrative treatment package for surgical candidates with disc herniation. **Materials and methods.** We selected 92 consecutive low back pain patients (20 to 60 years old) with lateral radicular pain to lower extremities diagnosed as lumbar disc herniation (prolapse-extrusion) confirmed by MRI since November 2006. All of them have been recommended for surgical management at other hospitals, but sought after a non-surgical alternative. The visual analogue scale of radicular pain was 5 or higher. Outcome measures are Visual analogue scale (VAS) of radicular pain, Oswestry Disability Index (Korean Version) and SF-36. Treatment package comprises Korean herbal medicine, Chuna (a Korean style systemic manipulative therapy), acupuncture, bee venom acupuncture (subcutaneous, or intramuscular). Treatment schedule for a total of 24 weeks involves weekly clinic visits during which relevant therapies are carried out and the medicine for the following week is given. Outcome measurements are assessed at baseline, 2,4,8,12, 24 week, 1 year and 2 year. Clinical data were obtained at baseline from physician questionnaire and examination. **Results.** Of 92 patients, 78 (84.7%) remained in the 24 week treatment plan and 64 (69.6%) could be checked at 1 year follow up. Finally, 57 (62%) could be checked at 2 year follow up. The mean scores of VAS, ODI and SF-36 at baseline were 7.24, 41.31 and 36 respectively. At 24 week, they were 0.91, 12.5 and 68.63 respectively. Pain and functional disability decreases as the patients get more treatments during the treatment period. At 1 year, they were 0.83, 8.27 and 72 respectively. They were 0.45, 6.14 and 77.36 respectively at 2 year evaluation. **Conclusion.** These results suggest that these integrative treatment package can be effective conservative treatment choice for some surgical candidates with lumbar disc herniation.

Early Rehabilitation in hemiplegic patients

M. Mandić¹, M. Spalević¹, N. Rančić²
¹Clinic for rehabilitation and physical medicine
²Clinical Center Niš, Serbia School of medicine Niš, Serbia

Introduction. Stroke rehabilitation therapy begins in the intensive-care unit after the patient's medical condition has been stabilized, often within 24 to 48 hours after the stroke. The objective of the paper was to compare the results of stroke rehabilitation in hemiplegic patients who had the thromboembolic stroke with those who had hemorrhagic. **Materials and methods.** The prospective cohort study was done. The study involved 114 (61 men and 53 women) hemiplegic patients. Functional status was assessed by Barthel index and it was determined at rehabilitation admission, and at discharge.

The first steps involve promoting independent movement because many patients are paralyzed or seriously weakened. "Passive" range-of-motion exercises are those in which the therapist actively helps the patient move a limb repeatedly, whereas "active" exercises are performed by the patient with no physical assistance from the therapist. To determine the etiology of the stroke computerised tomography was used. **Results.** Seventy nine (69.3%) strokes were thromboembolic and thirty five (30.7%) were hemorrhagic. The score of Barthel index before the onset of rehabilitation was 65.7 for the patients who had thromboembolic stroke and those who had hemorrhagic, the score of Barthel index was 35.8. When rehabilitation was finished the Barthel index score was 88.8 for the patients who had thromboembolic stroke and for those who had hemorrhagic it was 64.2. The difference which was found is significant statistically ($t=3.254$ and $p=0.042$). **Conclusion.** According to the presented results we can conclude that the patients who had the thromboembolic stroke had better functional recovery compared with the patients who had hemorrhagic.

References

1. Drake MC, Elizabeth F, Channon FE, Hall MJ. Sitting training early after stroke improves sitting ability and quality and carries over to standing up but not to walking: a randomised controlled trial. *Australian Journal of Physiotherapy* 53: 97-102.

Principles of good clinical practice in thermal rehabilitation

M. De Fabritiis¹, S. Masiero², S. Mariotti³, G. Gigante⁴
¹Rehabilitation Unit, A.O. Spedali Civili, Brescia, Italy
²Rehabilitation Unit, University of Padua, Italy
³Terme di Popoli (PE), Italy
⁴Physical Medicine and Rehabilitation, University "Tor Vergata", Roma, Italy

Introduction. Thermal rehabilitation is a branch of Rehabilitation for which there is still a lack of randomized clinical trials. We opted to follow new research and to draft practical guidelines for thermal rehabilitation in Italy according to a procedure that differs from the usual one. **Materials and methods.** An approach recently introduced to clinical research permits better definition of clinical guidelines. The new method grades the strength of recommendations according not only to the robustness of supporting evidence but also to the opinion of a panel of experts (Delphi method). We added a third element to the two above-mentioned strategies based on identification of best clinical practice, inspired by the Good Clinical Practice (GCP) method. **Results.** In drafting our protocols for thermal rehabilitation therapy we therefore identified a series of general principles to apply: paradigmatic indications; costs/benefits; efficacy; harmlessness; user compliance; limits; contraindications; patient suitability; ways of accessing treatment, etc. **Conclusion.** It is our opinion that the identified procedure will make it easier to realistically define good clinical practice guidelines for thermal rehabilitation in Italy. The process will therefore be based on the application of standards of good clinical practice to rehabilitation treatment protocols, bearing in mind not only expert opinion and currently available scientific evidence but also the judgement of patients or their associations.

References

Roddy E, Zhang W, Doherty M, Arden NK et al.: Evidence-based clinical guidelines: a new system to better determine true strength of recommendation. *J Eval Clin Pract.* 2006 Jun;12(3):347-52.

Spa and thermal treatments in PRM: The Italian project

M. De Fabritiis¹, S. Masiero², S. Mariotti³, G. Gigante⁴, M. Groppi⁵
¹Rehabilitation Unit, A.O. Spedali Civili, Brescia, Italy
²Rehabilitation Unit, University of Padua, Italy
³Terme di Popoli (PE), Italy
⁴Physical Medicine and Rehabilitation, University "Tor Vergata", Roma, Italy
⁵Rehabilitation Unit USL 9, Grosseto, Italy

Introduction. Over recent years, Italy has seen a significant emergence of rehabilitation treatments at numerous spa resorts, due to several factors (climate, physical/chemical effects of the water, healthy and relaxing environment). The synergism of action established between physical energy, spa therapies and rehabilitation techniques is now so well known that it represents one of the main positive arguments with regard to the benefits of implementing cer-

tain rehabilitation programmes in a spa environment. **Materials and methods.** In order to better quantify and qualify the current situation with regard to Rehabilitation at Italian spa resorts, we have collected some data from them in order to understand the range and types of rehabilitation treatments carried out. **Results.** We have analysed the data obtained from 43 spa resorts to which a specific questionnaire was sent. The results show that the kinds of conditions most commonly treated are: orthopaedic/rheumatological, neurological, geriatric, pneumological, vascular, urogynaecological, sports and cardiological. **Conclusion.** With a specialised Rehabilitation Unit, many spa resorts can offer comprehensive rehabilitation treatments, thus being able to assume the role of proper Rehabilitation Centres for their corresponding areas, in conjunction with other rehabilitation facilities, with the possibility of also running rehabilitation programmes in Day Hospitals or hotel residence. In particular cases which do not require continuous healthcare, this setting has always provided a realistic alternative to inappropriate hospitalised rehabilitation. There is a need, however, for rehabilitation treatment to offer the highest guarantees of reliability, quality and specialisation and thus for the therapeutic activity to be carried out by a rehabilitation team that meets the standards required, in close collaboration with the family doctor, the hydrologist and other necessary specialists. To date, in spite of the numerous worthy attempts to qualify and measure the results of the rehabilitation activity with increasingly specific evaluation scales, results once again show that user satisfaction is perhaps one of the most tangible pieces of data.

The rehabilitation of attention in acquired brain injury patients: Efficacy of the RehaCom® software

A. Redolfi¹, A. Maietti¹, S. Galeri¹, F. Stablum²

¹"E. Spalenza Rehabilitation Centre", Fondazione Don Gnocchi, Rovato (Brescia)

²Department of General Psychology, Padova University

Introduction. Aim of this study is to test the efficacy of the RehaCom® software in the rehabilitation of attention disorders in acquired brain injury patients. We also wish to examine the efficacy of this rehabilitation program in: 1) specific attention treated functions, 2) activities of daily living. **Materials and methods.** We assessed 9 patients with Traumatic Brain Injury (TBI) or Cerebral Vascular Accident, using both paper and pencil and computerized tests. The cognitive functions assessed before and after the treatment were: selective attention, sustained attention, divided attention and executive functions. In order to examine the patient's ability to cope with everyday life we assessed daily living activities by means of the Functional Assessment Measure. After the baseline assessment, patients start a daily individualized treatment programme of one hour a day for an average of 30 days of treatment. During the treatment programme with RehaCom® software patients performed specific tasks of selective, sustained and divided attention and planning. **Results.** Group results: Improvement of selective attention and strategy search ability in paper and pencil tests; improvement of the accuracy in the computerized sustained attention test; significant improvement of the FAM total score and of the single functional areas of mobility items, psychological adjustment and attention. Single cases results: Improvement of reaction times in five out of nine patients; improvement of selective attention scores in three out of nine patients. Only one patient improved his performance on the divided attention task. **Conclusion.** The use of the RehaCom® software in the rehabilitation of attention disorders may improve reaction time, selective attention and activities of daily living in acquired brain injury patients.

References

- Hall KM. Functional Assessment Measure. General rehabilitation and traumatic brain injury program evaluation. Santa Clara Valley Medical Center, 1992.
Schuster B. Rehabilitation of TBI using RehaCom. Eur Med Psy, 2002;38, 39-44.

The benefit of exercise training upon risk factors and subclinical atherosclerosis at hypertensive patients

M. Iurciuc¹, A. Avram¹, S. Iurciuc¹, A. Vlad¹, G. Ciorica¹, C. Avram²

¹University of Medicine Timisoara, Romania

²West University, Sport dep., Timisoara, Romania

Premises. Comprehensive rehabilitation has many benefic effects on cardiovascular system¹. **Introduction.** Our aim was to evaluate

the cardiovascular risk factors, hemodynamic parameters, and the ankle brachial index (ABI) before and after 4 months of ambulatory rehabilitation program. **Materials and Methods.** We selected 254 cooperative patients that reached the target value for blood pressure². They were under unchanged medication for at least 1 month. These patients were evaluated clinically, biologically and by stress test. We studied the hemodynamic parameter at rest and at exercise: systolic blood pressure (SBP), diastolic blood pressure (DBP), mean blood pressure (MBP), pulse pressure (PP), heart rate (HR); before as and after a 4 months physical training program. The patients were divided in two groups: ABI₁ group with ABI < 1 and ABI₂ group with ABI ≥ 1. **Results.** After 4 months of exercise training we obtained: a decrease in SBP from an average value of 136,8mmHg to 126,7 mmHg (p,0021), DBP from an average value of 79,2 mmHg to 76,8 mmHg (p,0829), MBP from an average value of 98,35 mmHg to 93,47mmHg (p,0328), PP from an average value of 58,7 mmHg to 50,8 mmHg (p,0029), HR from an average value of 79,1 beats/min to a value of 71,5 beats/min (p,0012). For the ABI₁ group the average value has increased from 0,92 to 0,98 (p,0069), and for ABI₂ group the average value has decreased from 1,28 to 1,09 (p,0029). **Conclusion.** Rehabilitation programs bring added benefits, regarding risk factors control, for hypertensive patients. Exercise training is a good method to improve some of the hemodynamic parameters: TAS, PP. Physical activity has beneficial effects upon arterial stiffness, improving also ABI values. We noticed improvements also at other parameters but not statistically significant: DBP, and MBP.

References

1. ESC Congress Barcelona Spain Aug 2009
2. ESC/ESH Guideline 2007

Effects of a rehabilitation program on prosthesis replacement in lower limb amputees

S. Brunelli, S. Delussu, F. Paradisi, R. De Giorgi, S. Bramucci, V. Grossi, G. Palini, M. Trallesi

Fondazione Santa Lucia, Scientific Institute for Research, Hospitalization and Health Care, Rome, Italy.

Introduction. The aim of the study was to analyze, in dysvascular transfemoral (TF) and transtibial (TT) amputees, the effect of 40 days rehabilitation training on prosthesis use and on walking capability after the replacement of the first temporary prosthesis (FTP) and the delivery of the second permanent prosthesis (SPP). **Materials and methods.** We enrolled 22 TF and 15 TT FTP users (age: 74.2±9.2y), consecutively admitted to our Institute during last year for the replacement of their prosthesis. The subjects were evaluated by means of the Timed-Up and Go-Test (TUGT), 2-minute Walking Test (2minWT), Locomotor Capability Index-5 (LCI-5) and Houghton Scale. Subjects were evaluated at admission before they were fitted with SPP, than after 20 and 40 days of SPP training. Each subject followed a prosthetic training of 40 days. The Student's t-test was used for statistical analysis. **Results.** Initial values recorded using FTP were 44.8±21.2s (TUGT) and 41.2±18.6m (2minWT). The subjects significantly improved in TUGT (30.5±7.4s; p<.01) and in 2minWT (54.5±14.6m; p<.01) after 20 days of SPP training. A further significant improvement was recorded at the 40th day evaluation (29.8±10.9s and 62.5±19.0m) with respect to the first (TUGT: p<.005; 2minWT: p<.001) and the second one (TUGT: p<.005; 2minWT: p<.001). A significant improvement between the first and the last evaluation was found also in LCI-5 (from 25.4±12.0 to 34.7±9.3; p<.001) and in the Houghton Scale (from 4.7±2.6 to 7.8±1.7; p<.001). **Conclusion.** The observed improvements in the prosthetic use and walking capability suggest the usefulness of a training program lasting 40 days after the permanent prosthesis delivery. It is surprising that stabilized prosthetic users showed such an improvement, suggesting that the replacement of the prosthesis shouldn't be only a "prosthetic" work.

References

- Rommers GM et al. Mobility of people with lower limb amputations: scales and questionnaires: a review. Clin Rehabil 2001;15:92-102.

Effects of administration of rhythmic sound frequencies across a co-vibrating surface: Case report

F. Giubilei, G.A. Lanfaloni, M. Marchionni, M. Menna
Istituto Serafico, Assisi, Italy

Introduction. The authors are conducting a research project utilizing sound stimulation in a controlled environment to obtain behavioural responses classified as improved communication skills, adaptive responses to the environment, and emotional well-being(1,2). A case study with video footage is presented describing an immediate and repeatable behavioural response associated to a specific sound stimulation according to mirroring and tracing phenomena(3,4). **Materials and methods.** Equipment: Quadraphonic system with subwoofer; Wooden platform; PC; Digital videocamera. Patient Profile: G.B.; age:35. Diagnosis: cerebropathy secondary to rubella encephalopathy; severe mental retardation; blindness; behavioral disorder; generalized convulsive/non-convulsive epilepsy. The patient underwent sound stimulation on a co-vibrating platform (5) for a 15-minute time period biweekly: first with recorded classical music, subsequently with different rhythmically-tuned sound frequencies (6). A specially-designed graph was used to record the patient's behavioral reactions immediately before, during, immediately following, and a few hours post-stimulation. The initial observations illustrated an unwillingness to accept the musical sequences presented. Stimulation was then presented emulating the rhythm of the patient's stereotypical sounds. **Results.** The mirroring of the patient's sequences resulted in progressive immobilization with catatonic-like traits. The response reoccurred with significant predictability. The behavioral reactions post-stimulation are undergoing statistical analysis. **Conclusion.** Mirroring and tracing are well-known concepts in music therapy. These phenomena appear to produce more effective responses with the co-vibrating platform: relaxation/sustained control of problematic behaviours.

References

1. Trappe H.J. "Music and health: what kind of music is helpful for whom? What music not?", *Dtsch Med Wochenschr.* 134(51-52):2601-6, Dec. 2009.
2. Wigram T., Pedersen I.N., & Bonde L.O. "Guida generale alla musicoterapia. Teoria, pratica, clinica, ricerca e formazione" Ismez edizioni, Roma 2000.
3. Bandler R., Grindler J. "Ipnosi e trasformazione". Ed. Astrolabio 1983.
4. Scardovelli Mauro "Il dialogo sonoro". Ed. Cappelli 19.
5. Marchionni F, De Franceschi B, Baglioni A, Lanfaloni GA, Giubilei F, Macri R, Menna M. "Studio osservazionale sulle risposte comportamentali di persone con ritardo mentale grave, gravissimo e deficit sensoriale..." Atti Congresso SIMFER 2008.
6. Rainev Perry MM. "Relating improvisational music therapy with severely and multiply disabled children to communication". *J Music Ther.* , 2003 Fall; 40(3):227-46.

Post-stroke neuropathic and nociceptive pain

A.Sarah Nica, G. Mologhianu, B. Ilinca Mitoiu, A. Murgu, M. Ivascu
University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania

Introduction. Rehabilitation of stroke is a major problem nowadays and our clinic deals everyday with patients suffering of different types of post-stroke complications. One of it is pain, both neuropathic and nociceptive. The question is: are we able to intervene and improve it by specific rehabilitation measures? **Materials and methods.** We tried to answer to this question by completing the study including 50 patients with post-stroke pain that came to our clinic between January 2009 - January 2010. All the patients included in the study had a medication treatment (systemic drugs recommended by the neurologist and cardiologist) and a two weeks rehabilitation program including different types of physical therapy (electrotherapy, kinetotherapy, massage) adapted to each subject. The pain was measured using VAS scale, before and after applying the rehabilitation program and results for the neuropathic and nociceptive pain were compared. **Results.** The results confirm our first hypothesis that nociceptive pain is more likely to be influenced by the rehabilitation program (more than 60% of our patient had an improved result for the pain). Of course, neuropathic pain was also issued, and the slighter results in the area are probably also the consequence of the too short period of treatment. **Conclusion.** We have only the short term results for the proposed therapy. More sessions of rehabilitation are needed in order to decide how the rehabilitation program influences pain, especially neuropathic pain on long term.

References

Martin Grabois – Chronic pain syndrome post CVA - evaluation and treatment

M. Chauviere – Proposition de bilan pour le patient hemiplegique
Marita Widar, Lars Samuelsson, Susanne Karlsson-Tivenius, Gerd Ahlstrom -
Long-term pain conditions after a stroke

Hospital and ambulatory-based cardiovascular rehabilitation programmes in coronary patients with revascularisation procedures

A. Avram¹, S. Iurciuc¹, L. Craciun¹, M. Iurciuc¹, C. Avram², D. Gaita¹, S. Mancas¹

¹Victor Babes University of Medicine and Pharmacy, Timisoara, Romania

²Physical Education and Sport Faculty, West University Timisoara, Romania

Introduction. There is an important aggregation of cardiovascular risk factors (RF) in coronary patients following revascularisation procedure, leading to an increased residual cardiovascular risk. The aim of our study was to assess individual RF control in revascularised coronary patients addressed to ambulatory or hospital-based rehabilitation programmes. **Materials and methods.** We enrolled 227 patients, split into 3 groups. Group A with 76 patients, participated in an ambulatory rehabilitation program; Group S with 75 patients, participated in a comprehensive hospital-based rehabilitation program; Group C with 75 patients who did not attend rehabilitation. We assessed 5 RF (hypertension, hypercholesterolemia, diabetes mellitus type 2, obesity, smoking) control, according to 2007 ESC Prevention Guidelines after revascularization and after 16 months. We analyzed individual RF control using a simple score method (*Number of RF at target/Total number of RF in a person x 100*). We defined a score $\leq 25\%$ as *poor control*; a score 26 - 50% as *mild control*; a score 51 - 75% as *satisfactory control*; and a score $> 75\%$ as *good control*. **Results.** At baseline, most of the patients in the 3 groups controlled less than 50% of their RF: *poor control* (Group A-55%, Group S-59%, Group C-50%); *mild control* (Group A-27%, Group S-26%, Group C-25%). *Good control* was realized in 3% in Group A, 4% in Group S and 9% in Group C. After 16 months, increased highly statistically significant the number of patients reaching a *satisfactory control* in Group A ($p=0,003$) and Group S ($p=0,001$). *Good control* increased statistically significant only in Group S ($p=0,02$). The number of patients with *poor control* decreased statistic significant in all groups. **Conclusion.** Rehabilitation programmes improve individual RF control in revascularised coronary patients. Hospital-based rehabilitation programmes are more effective in optimizing cardiovascular risk due to their comprehensive approach.

References

1. Graham I, Atar D, Borch-Johnsen K, et al. European guidelines on cardiovascular disease prevention in clinical practice. *Eur J Cardiovasc Prev Rehabil* 2007; 14 (Suppl 2): S1-S113.
2. Mehta R, Bhatt D, Steg G, et al. Modifiable risk factors control and its relationship with 1 year outcomes after coronary artery bypass surgery. *Eur Heart J* (2008) 29, 3052-3060.

Influence of individual factors in the development of musculoskeletal disorders of the neck amongst medical professionals

B. Rama, A. Murtezani, X. Shkodra, V. Krasniqi, T. Osmani
???

Introduction. Musculoskeletal system disorders (MSD) includes numerous varieties of inflammatory and degenerative conditions which are damaging muscles, tendons, ligaments, joints, peripheral nerves, inter-vertebral discs, and blood vessels. **Objective.** The main objective of this study is to determine the correlation between the individual factors associated with work and musculoskeletal disorders of the neck amongst medical professionals. **Materials and Methods.** Study was performed at the Main Family Practice Center No. 1 in Prishtina and it includes 89 subjects from the total of 298 employed personnel, age group from 18 up to 65 years old. Modified version of the "Nordic Musculoskeletal Questionnaire" was used to obtain necessary information related to musculoskeletal disorders of the neck, its nature and clinical manifestation. **Results.** After a detailed medical examination 89 cases with MSD of the neck are verified. Prevalence of MSD of the neck is more frequent among females 86.5% and males with only 13.5%. MSD of the neck was more prevalent amongst medical professionals with more than 15 years of working experience (73%). From the examined personnel there nurses are more affected (49.4%). Most frequent MSD of the

neck was Cervical – Brachial Syndrome in 51 cases or 57.3%. **Conclusion.** Prevalence of MSD is higher amongst medical professionals with more years spend in trade (more than 15 years) due to the fact that this population is more exposed to the work related risk factors influence. Individual prominent risks for the prevalence of MSD of the neck are: age and years in trade, because of the longer working experience and continuous exposition to provoking factors.

Reference

1. Aasa U and co. IRelation ships between work-related factors and disorders in the neck and low back region among female and male ambulance personnel. *J Occup.Health* 2005;47:481-489.

New technologies to measure hoarseness (Dysphonia) recovery following phonological rehabilitation in a patient with central hemi-laryngeal palsy

M. Mignano, G. Albertini, M. Franceschini, E. Palma, R. Semprini
IRCCS San Raffaele Pisana, Roma

Introduction. Diagnosis and treatment of the immobile or hypomobile vocal cord are challenging for the otolaryngologist and for logotherapists as well. Video-telediarinoscopy and vocal spectrographic analysis are diagnostic tools useful in clinic for diagnostic proposals. However, these techniques may be useful also to measure with major precision both the laryngeal function and the vocal emission in patients during rehabilitative programme. Aim of this study is to qualify the above mentioned techniques in a case of central laryngeal palsy due to ischemic stroke of the bulb. In particular we propose the use of these tools for clinical evaluation of the laryngeal and vocal functions along the whole duration of phonological rehabilitative programme. **Materials and methods.** A 56 years old Caucasian male, suffered from bulbar ischemic stroke. He presented with hemilaryngeal, and vocal cord palsy. Video-telediarinoscopic and vocal cord spectrographic analysis were performed before he started phonological treatment and at the end. For our scopes we used digital telaryngoscope Kay-Pentax, computed-assisted vocal spectrograph CSL 5400 Kay-Pentax, MDVP multidimensional voice program Kay-Pentax software. **Results.** At the end of the rehabilitative treatment video-telediarinoscopic and vocal cord spectrographic analysis showed that phonological therapy potentiated the cord adduction, the mobility of the vocal cord and as a consequence ameliorated the hoarseness. The software we used allowed us to measure the recovery entity. **Conclusion.** This case represents the first case in which new computed assisted technologies were used as tools for quantification of clinical recovery of laryngeal palsy. This in general might represent a new strategy for evaluation of laryngeal paralysis due to either pharmacological or rehabilitative treatment.

References

- Tucker HM. Laryngeal paralysis: etiology and management In: English GM ed. *Otolaryngology* (cap. 45). Philadelphia: Harper& Row Publ 1983.
Behrman A. Evidence-based treatment of paralytic dysphonia: making sense of outcomes and efficacy data. *Otolaryngol Clin North Am.* 2004 Feb;37(1):75-104, vi.

Study of effect of Robotic therapy on the gait characteristics of Parkinson Disease patients

A.A. Telenkov, A.V. Voronov, A.S. Klochkov, L.A. Chemikova
Research Center of Neurology of RAMS, Moscow, Russia

Introduction. Gait disturbance in patients with Parkinson disease (PD) is the major factor affecting quality of their life. Although addressed by conventional rehabilitation, gait training might benefit from the use of innovative robot-assisted device Lokomat. To test this hypothesis feasibility of the using the Lokomat robotic system in patients with PD was analyzed. **Materials and methods.** Twenty patients (9 women, 11 men) with akineticrigid and rigid-tremor form of PD, age 35-65 years, Hoehn and Yahr stage 3-4 practiced walking with the robot-assisted Lokomat system. Vertical body weight unloading 35.6±3.7 % and unexpected changes of treadmill speed (from 1.2 to 1.9 km/h) were applied during training sessions lasting from 15-21 to 40-45 min. The values of vertical and horizontal (up to 5% - 0%) weight unloading had been gradually decreased over time. The training course included 10-15 sessions. Clinical evaluation of patients was done using the 42 items UPDRS scale before and after practice with specific attention to the items 22 (stiffness), 29 (gait), 31 (body bradikinesia/hypokinesia), test of 20-m walking. Ten patients was measured with videoanalysis motion system to

assess joint angle velocity and acceleration in the hip, knee and ankle joints as biomechanical gait characteristics. **Results.** After course of Lokomat therapy significant improvement of most measured variables was observed including bradykinesia decrease of 41.0%, stiffness – of 22.9%, walking speed increase of 30.6%. Therefore, upon completion the Lokomat therapy, participants demonstrated increased step length and reduced time to make a 180° turn. Biomechanical gait parameters measured with videoanalysis motion system also have increasing behavior for joint velocity and acceleration in hip, knee and ankle joints. **Conclusion.** The results showed that robot-assisted gait therapy with the Lokomat system can be used in rehabilitation of patients with PD. Further studies are needed to assess the effect of Lokomat therapy on the gait of patients with PD.

Use and prescription of powered electronic wheelchairs for patients with severe Acquired Brain Injury (ABI)

D. Saviola¹, A. De Tanti²

¹Neurologist

²Rehabilitation Physician

Centro Cardinal Ferrari Fontanellato (PR)

Introduction. The purpose of this study is to evaluate the modifications of the patient's quality of life as well as their caregivers' following the improvement of the patient's mobility due to a powered wheelchair use. Referring to assistive devices with a higher technology, the carriers of severe ABI sequences are a particular users group, from the technical point of view of the rehabilitation team. In fact, an appropriate prescription should take in consideration not only a reliable prognostic definition but above all a precise balanced evaluation of remaining cognitive abilities, taking in consideration also probable interferences of behavioural disorders. **Materials and methods.** This study has been carried out with 23 patients affected by severe ABI recruited by our Centre . In our study the multidisciplinary evaluation protocol provides for ca. 15 hours work of both patient and caregiver, assisted by a team of rehabilitation operators and is divided in the following phases: case history; neuro-ophthalmologic, otological, neuro-motor and neuro-psychological evaluation; global disability and care need assessment; analysis of the assistive devices in use; architectural barriers evaluation; posture analysis, wheelchair set up, interface choice and set up; ability evaluation of wheelchair use in the inner spaces on predefined courses; track and street drive tests on different paths; follow-up. **Results.** 20 out of 23 enrolled subjects have been deemed suitable for the device; due to cognitive impairment and improper conduct during street training 3 subjects have been deemed non suitable for the device. **Conclusion.** Since high-tech devices are expensive and above all potentially dangerous in case of improper use, the necessary rigorous methodology imposes that the devices are tested by an experts team, expressing a comprehensive analysis, with quantifiable data. We believe that this evaluation protocol we have worked out, is an effective tool able to guarantee an appropriate prescription of a power wheelchair for the severe ABI patients.

Efficacy of intrathecal baclofen delivered by an implanted programmable pump in the treatment of spasticity by acquired brain injury: our experience

M. Tiberti¹, C. Inglese¹, A. De Tanti²

¹Neurologist

²Rehabilitation Physician

Centro Cardinal Ferrari Fontanellato (PR)

Introduction. This study aims to evaluate the efficacy and safety of intrathecal baclofen (ITB) delivered by a programmable pump (SynchroMed®, Medtronic. Inc. Minneapolis, MN) in patients affected by spasticity due to acquired brain injury, recruited by our Centre. **Materials and methods.** This is a part of a prospective, ongoing multicenter study including 21 Italian centres. Between August 2007 and January 2010, our centre has recruited 26 patients according to the following criteria: (1) chronic disabling spasticity by acquired brain injury; (2) insufficient response to treatment with maximum doses of oral baclofen. They have been evaluated at baseline, 3 and 12 months post-ITB pump implant. Before the implant, all the sharers have been underwent to a screening test with bolus or infusion of intrathecal baclofen. A positive response, defined as a

mean drop of at least 1 point on the Ashworth Scale, was a prerequisite to implantation of the ITB pump. **Results.** Of 26 patients recruited, 9 failed screening test and 4 did not complete the follow-up: 2 have been lost and 2 are dead by causes not related to drug or device. In current time, 10 patients have completed the follow-up at 12 months. Ashworth mean score decreased significantly only for the lower limbs from $3,3 \pm 0,6$ before treatment to $2,3 \pm 1,1$ at follow-up visit ($p < 0,05$). The adverse events reported have been: pocket seroma (6 cases), catheter dislodgement (1 case), bradycardia (2 cases), nausea (1 case), cutaneous erosion along the stitches of anchorage of catheter to the lumbo-dorsal fascia (2 cases), transitory urinary retention (2 cases), apoplectic fit (1 case). **Conclusion.** This study suggests that ITB therapy is a effective and well tolerate treatment for spastic hypertonia by acquired brain injury. There have been no serious adverse events.

Poland syndrome. Use of kinesiotaping in improving back pain and numbness of the upper limb

N. Roussos, D. Kalantzopoulos, V. Aggeli, I. Sioutis, A. Farmakides, N. Lykos, D. Patatoukas

PRM Department, "Asklepieion" General Hospital, Voula Greece

Introduction. Poland syndrome is a congenital anomaly, noted for the underdevelopment or absence of the chest (pectoralis,) muscles on one side of the body as well as webbing of the fingers (cutaneous syndactyly) on the hand of ipsilateral side of the body. The severity of Poland syndrome is variable, and it is possible for mild cases not to be evident until puberty. It is felt, therefore, that cases may be misdiagnosed. **Materials and methods.** A male patient, 48, referred for EMG study, suffering from persisting back pain and numbness of the Lt upper limb. The EMG study didn't reveal any findings compatible with neurogenic lesion in roots of the cervical spinal. Clinical examination showed elevation of the Lt scapula, consisted spasm of the Lt trapezius, absence of the major part of the Lt pectoralis and ipsilateral cutaneous syndactyly. The whole appearance was compatible with Poland Syndrome. Our intervention focused on providing the patient with a painless period during which he would strengthen his muscles and correct his muscle imbalance. Physical means alone had no effect. Acupuncture was not tolerated by the patient. A kinesiotapping program was applied aiming at correcting his posture and providing cutaneous stimulation to enforce the action of the remaining muscle groups. Kinesiotaping technique is based on cutaneous stimulation over the hyper-acting muscle groups. Taping gives proprioceptive stimulation that motivates the nervous system causing auto-correction of posture and reducing pain. **Results.** The patient's symptoms were improved after a few sessions and he was able to start a program of muscle strengthening. Improvement of quality of sleep was the first sing followed by elongation of the painless periods and reduction of numbness. **Conclusion.** Providing a patient suffering from Poland syndrome, with a painless frame period, encourages systematic muscle strengthening leading to pain relief.

Hallervorden-spatz disease. Improvement in quality of life after injection with botulinum toxin type A. And physiotherapy

N. Roussos, V. Aggeli, I. Sioutis, V. Mitsis, A. Farmakides, N. Lykos, D. Patatoukas

PRM Department, "Asklepieion" General Hospital, Voula Greece

Intriduction. Hallervorden-Spatz disease, is a rare neurological disorder due to abnormal iron metabolism in the brain. Iron is deposited in the globus pallidus and the pars reticulata of the substantia nigra. It is characterized by dystonia, rigidity, and choreoathetosis, progressive intellectual impairment, retinitis pigmentosa and optic atrophy. The onset is during the first two decades of life. The course of the disease usually proceeds over 10-12 years. **Materials and methods.** We report the case of a 43-year-old man whose illness spanned 15 years. Patient had a very sever spasticity in hip adductors and Lt gastroc, vision problems and mild cognitive disorders. The patient was unable to walk and deal with his daily activities. A previous effort for rehabilitation failed due to lack of collaboration. A botuline A injection was decided, even he had low life expectancy and cognitive ability. WHOQOL-BREF questionnaire has been used to investigate the changes in the life of the patient and his sister, before and after the use of botulin toxin. This questionnaire has 26

questions about the quality of life, the physical and psychological problems, the sleep, the recreation capacity, the social interactions and the daily living activities. **Results.** The patient's quality of life was improved by 60% and his sister's by 37%. Physical and psychological problems improved by 50% and 25%. Activity improved by 75% and 50%, the recreation capacity improved by 38% and 72%, social interactions improved by 50% and 25%, daily living activities by 50% and 87% and the sleep both of them improved by 75%. **Conclusion.** Rehabilitation is meaningful even in the most affected cases. Short life expectancy and low intelligent quotient should not be an inhibition for rehabilitation. The supporting group has a domain role to play in the rehabilitation and has the highest percentage of the benefit.

Quality of life in patients with rheumatoid arthritis

V. Mani, V. Aggeli, I. Sioutis, N. Roussos, A. Farmakides, C. Goumas, D. Patatoukas

PRM Department, "Asklepieion" General Hospital, Voula Greece

Introduction. EuroQoL is a Quality of Life Scale that is validated and well used in patients with rheumatoid arthritis. This scale is based on five questions concerning mobility, self-care, usual activity, pain/discomfort and anxiety/depression. Each question is answered with 3 grades. (grade 1) I have no problems, (grade 2) I have some problems and (grade 3) I am unable. **Materials and methods.** The questionnaire was distributed to 20 patients with rheumatoid arthritis who were referred to our outpatient rehabilitation clinic. **Results.** The mean age of the patients was 55.22 years, and mean duration of suffering from rheumatoid arthritis was 30.25 years. Women were 92.8% of the subject. From 5 items most disabling was mobility with mean grade 1.85, followed by Self-Care (1.65), Pain/discomfort (1.6), usual activities (1.55) and finally anxiety/depression (1.35). **Conclusion.** EuroQoL is a Quality of Life Scale simple and reliable and can used in rheumatoid arthritis to help rehabilitation stuff understand better the needs of such patients.

How does cognitive fatigue modify cognitive performance in multiple sclerosis (MS) patients?

A. Morgantini, L. Catena, L. Pierfederici, L. Bacci

Istituto Di Riabilitazione Santo Stefano – Centro Villa Adria - Ancona

Introduction. Cognitive fatigue can be measured as an inability to maintain initial levels of attentional performance.(1) Researchers didn't agree whether a longer and continuous effortful cognitive task increases mental fatigue and changes neuropsychological performance.(2,3). The objectives of this study were: to examine the cognitive performances and ratings of subjective cognitive fatigue using cognitive fatiguing tasks lasting different times and to evaluate the correlation between subject cognitive fatigue and the objective performances. **Materials and methods.** Of 110 individuals with MS, only 45 patients presented significant fatigue (measured with vigilance test of Test for Attentional Performance)and initial cognitive deficit (Symbol Digit Modalities Test) and were randomized in three groups, matched for different initial levels of cognitive deficit. Each group completed a neuropsychological training in a single session lasting different times(15, 30, 45 minutes). Subjective measure of fatigue(cognitive Modified Fatigue Impact Scale(MFIS)subscale) and attentional test(Paced Auditory Serial Addition Task(PASAT)) were rated before and after the session. **Results.** There were no significant differences between the three groups on PASAT. Although cognitive MFIS subscale didn't significantly differ for the three groups, the value is close to significance. There was no significant correlation between change in subjective fatigue and cognitive performance. **Conclusion.** Changes in performance over time showed improvement rather than deterioration. These results confirm that patients' subjective ratings of their fatigue are not valid indicators of their actual performance on cognitive tests and that the cognitive fatigue doesn't decline more rapidly over the time engaged in mental activity.

References

- Schwid SR. Fatigue in multiple sclerosis: current understanding and future directions. *J Rehabil Res Dev* 2002 Mar-Apr; 39 (2): 211-24
- Barak Y. Cognitive fatigue in multiple sclerosis: findings from a two-wave sreening project. *J Neurol Sci.* 2006 Jun 15;245(1-2):73-6.Epub 2006 Apr 19
- Beatty WW. Changes in neuropsychological test performance over the workday in multiple sclerosis. *Clin Neuropsychol* 2003 Nov; 17 (4):551-60.

Effectiveness of ESWT for patients with plantar fasciitis: follow-up at five years

B. Lombardi, M. Imbrenda, I. Spaghetti, F. Troncati
Rehabilitation Ward Misericordia & Dolce Hospital Prato

Introduction. Several research studies have demonstrated that the application of ESWT produces a biological response in tissues. Plantar fasciitis is frequent cause of talloidinia. It is linked to calcaneal spur (1), and characterized by pain, functional impotence, foot swelling (2) **Materials and methods.** Twenty five (25) patients (14 M and 11 F) median age 60 yy. were followed at our ward for plantar fasciitis, awake functional impotence and foot swelling. All patients had talloidinia for at least 6 months with no response at analgesic treatments and were assessed by the Ankle – Hind Foot scale (AOAFS) at the beginning (T0) and end of treatment (T1). The evaluation was repeated at 3 month (T2), 1 year (T3), 2 years (T4), 4 years (T5) and 5 years (T6). Exclusion criteria were: previous surgery on the plantar fascia, previous foot's fracture, ankle traumatic contusion or distraction, rheumatoid arthritis, ankylosing spondylitis, Reiter's syndrome, severe hip and knee arthritis, diabetes. Treatment consisted of shock wave treatment (ESWT) once a week for 4 time (2400 pulses at 0.04 mJ/mm² with Minilith SL1 by Storz Medical). The statistical analysis was performed using Wilcoxon test for paired samples, minimum significance's level p = 0.05. **Results.** Twenty one (21) patients completed the study. 2 patients drop out at T3 and 2 patients at T4. We found a clear reduction of pain and increase in functional improvement at T1 and T2 and results are maintained at T3, T4, T5 and T6. **Conclusion.** Shock wave therapy is effective for treatment of plantar fasciitis. Functional recovery, reduction of pain, and gain in quality of life even after five years demonstrate that shock wave are a successful and reproducible method for the treatment of plantar fasciitis.

References

1. Buchbinder R, Ptasznik R, Gordon J, Buchanan J, Prabhakaran V, Forbes A. Ultrasound guided extracorporeal shock wave therapy for plantar fasciitis JAMA 2002, 288:1364.
2. Riddled M, Pulisic P, Pidcoc P, Johnson R. Risk factor for plantar fasciitis: a matched case-control study JBJS 2003; 85a.

Can Intrathecal Pumps with Blocked Catheters be re-used?

M. Cirasanambati, J. Mathews, J. Singh, A.B. Ward
North Staffordshire Rehabilitation Centre, University Hospital of North Staffordshire, Stoke-on-Trent, United Kingdom.

Introduction. Aim of study is to investigate the efficacy of intrathecal drug delivery systems following prolonged periods of catheter blockage. Catheter blockage is a major cause of intrathecal drug delivery pump dysfunction, requiring system revision. Manufacturers advise that stopping pumps for longer than 48 hours may damage internal pump tubing systems and affect drug delivery. It is unclear, from literature review and manufacturer data, how prolonged periods of catheter blockage affect the function of the pump and whether catheter replacement alone could allow their continued use in the same patient. **Materials and methods.** Four explanted Synchromed II (Medtronic, Inc.) pumps with objective evidence of catheter blockage from radio-opaque contrast studies were investigated. Open system volumetric analysis of the four pumps with three different flow rates (minimal, intermediate and maximal) was performed. This was then compared against closed system volumetric analysis to compensate for the evaporation losses. **Results.** The mean period from diagnosis of catheter blockage to explantation was 4.2 months (range 3- 6 months). Two of the four catheters had blockage at the spinal end, one was kinked midway along its length and the fourth was caught in the anchoring suture of the pump. Variation of actual outflow volume in comparison with expected outflow for the set rate ranged from -4% to 8% at minimal rate, -1% to 7% at mid flow rate and -5% to 7% at maximal flow rate for all four pumps. All were within the manufacturer's acceptable range of +/- 14.5% of the expected outflow. **Conclusion.** This study demonstrates that pump function is retained within an acceptable range following prolonged outflow blockage. There is potential for the continued use of these pumps for the remainder of their battery life by replacement of the catheter system alone.

Occupational therapy and amyotrophic lateral sclerosis

G. Marcassa, A. Merico, E. Mancini, T. Saoner, A. Marcante, K. Koutsikos, F. Piccione
IRCCS San Camillo, Italy

Introduction. The rehabilitation approach for Amyotrophic Lateral Sclerosis patients has been changing over the last several years; many studies demonstrate the importance a multidisciplinary team during the course of treatment for this illness. An important member of interdisciplinary teams is the Occupational Therapist. In Italian hospitals, the presence of occupational therapists is rare. This study investigated the inclusion of an Occupational Therapist in an Amyotrophic Lateral Sclerosis team of IRCCS S. Camillo - Italy by measuring patient level of autonomy for ADL skills. **Materials and methods.** The study utilized 9 patients who were treated from January to December 2008 by the Occupational Therapy Service of the hospital. Data collected measured patient's independent performance in ADL skills; these data were collected by comparing results of the Functional Independence Measure Scale (FIM Scale) at time of admission and hospital discharge. OT treatment included the following: ADL training; PC adjustments; activities adjustments; assistive technology counseling and assessment. **Results.** Data analysis show an increase in level of functioning for all patients in independence (75,889±18,891; 81±19,698). **Conclusion.** The methodology did not allow an identification of the specific contribution of OT to treatment outcomes because the team utilized the same objectives. However, the introduction of the OT in a Amyotrophic Lateral Sclerosis team was a positive experience. The OT is the link between the team and the lives of the patient and that of his/her family; the discipline added important aspects about the patient and his condition resulting in a more holistic view of the patient. Another conclusion of this study highlights the need to develop a specific Occupational Therapy assessment for Amyotrophic Lateral Sclerosis.

References

- Louisa Ng, Fary Khan, Susan Mathers. Multidisciplinary care for adults with amyotrophic lateral sclerosis or motor neuron disease; Cochrane Database Syst Rev. 2009 Oct 7;(4):CD007425. Review

Therapeutic exercise in Steinert myotonic dystrophy – Case Report

D. Saraceni, M. Salli, C. Foti
PhD school "Advanced technology in Rehabilitation Medicine" Tor Vergata University, Rome (Italy)

Background. Steinert syndrome is described as an autosomal dominant inherited disease of the skeletal and cardiac musculature characterized by progressive muscle weakness and myotonia. Myotonia manifests with abnormally slow relaxation after strong voluntary contraction of the muscles. **Study design.** A case report of a patient with Steinert syndrome is presented. **Materials and methods.** A 45-year-old man was treated by therapeutic exercises: muscle recruitment of all limbs, breathing exercise, active and passive articular mobility, deambulation and step training with correct posture and occupational therapy with hand training exercises. The muscle strength of interossei muscles, elbow flexor, anti-gravity muscles of the lower limbs were measured by a strain gauge. The functional autonomy was assessed by Barthel index. **Results.** Initial Barthel scale: 78. Final Barthel scale: 95. Evident reduced strength of the bilateral interossei and lumbrical muscles with consequent deficit of hand movement (sx>dx) but better than the first evaluation. Tendon reflexes: Hyporeflexia. Coordination arm test: normal. Lower limbs: no deficit of global strength. Improved recruitment of tibialis anterior, quadriceps and gluteus muscles, persists though moderate atrophy of the gluteus. **Conclusion.** The muscle strength after one month of multi-therapeutic program was improved. Given the results obtained from the rehabilitation treatment, we confirm that the role of therapeutic exercise is essential in Steinert myotonic dystrophy.

References

- The changes in muscle strength and relaxation time after a comprehensive rehabilitation program for patients with myotonic dystrophy. Moon JH, Na YM, and coll. Yonsei Med J. Aug; 37(4):237-42.

Evaluation of extracorporeal shock wave therapy (ESWT) in the treatment of chronic plantar fasciitis

J. Nieto, M.J. Matos, R. Martín, L. Gestoso, L. González, C. Villarino
Department of Physical Medicine and Rehabilitation. University Hospital Centre A Coruña, Spain.

Introduction. Plantar fasciitis can be a chronic and disabling cause of foot pain. For refractory cases, extracorporeal shock wave therapy (ESWT) has been proposed as therapeutic option. The purpose of our study was to evaluate the effect of ESWT in chronic plantar fasciitis. **Materials and methods.** A retrospective review of patients who underwent consecutive ESWT between January 2008 and December 2009 was performed. Patients received three sessions. Once a week 2000 impulses (0.371 mJ/mm² and 3 Hz) were applied. Visual analog scale (VAS) and Maudsley Roles Scale were used to compare pain and functional status before and after completing the therapy at one, three and six months after treatment. **Results.** Fourteen patients suffering from plantar fasciitis were studied. All patients had received previous treatment: 92% drug treatment, 21% infiltration, 64% physiotherapy and 78% insoles. The average duration of symptoms was over 12 months in 64.3%. Bilateral plantar fasciitis was found in 35.7%. We observed that 57.1% had significant pain during the therapy. Patients showed a considerable pain decrease 1 month after the third session. We obtained satisfactory results in 69.3% of cases using Maudsley Roles Scale (38.5% excellent and 30.8% good results). Previous cortisone injections, duration of symptoms, presence of bilateral symptoms, age and sex did not influence the outcome of ESWT. **Conclusion.** ESWT proved to be an effective treatment option for patients with chronic plantar fasciitis that failed to respond to conservative treatment. It is considered an effective treatment with easy controls and monitoring. We haven't found predictive parameters for successful outcome.

References

1. Colin E Thomson. The effectiveness of extra corporeal shock wave therapy for plantar heel pain: a systematic review and meta-analysis. *BMC Musculoskeletal Disorders* 2005; 6:19.
2. Ana Lafuente Guijosa. Fascitis plantar: revisión del tratamiento basado en la evidencia. *Reumatol Clin.* 2007; 3 (4):159-65.

Quality life: comparison between different rehabilitation settings in multiple sclerosis (MS) patients

A. Morgantini, R. Acito, A. Falappa, L. Bacci, R. Santoni, R. Raspa, L. D'Angelantonio, T. Zaccari, G. Pirani
Istituto Di Riabilitazione Santo Stefano, Centro Villa Adria, Ancona

Introduction. Rehabilitation treatment may reduce disability and improve quality of life in MS patients. (1) .Objective of this study is : verify if there are different results about quality of life, misured by SF-36 (2), acting the same treatment (time of treatment and treatment technique) in different settings (outpatients, inpatients, DH patients). **Materials and methods.** 45 SM patients of 130 were selected using specific inclusion and exclusion criteria and divided into three groups by a randomization program. Patients of each group were treated for twenty sessions lasting 45 minutes, using the same rehabilitation technique but in different settings; quality of life has been measured using SF - 36 score at the beginning of treatment and at the end; standing balance also has been evaluated using Berg score. **Results.** Outcome scores were analyzed in terms of change scores between latter and former evaluation using SPSS 13.0 for Windows; ANOVA test also has been used. We found a significative statistical improvement of SF - 36 score in the three groups; best scores were reached in two items (physical activity and physical pain) and in the inpatients and DH patients in particular. **Conclusion.** Rehabilitation training betters the self perception in all patients treated; better results are reached by recovery and DH training, and particularly in increasing physical activity and reducing pain.

References

1. Patti F, Maria R. Ciancio, E. Reggio, R. Lopes, F. Palermo, M. Cacopardo and A. Reggio "The impact of outpatient rehabilitation on quality of life in multiple sclerosis" *J Neurol* (2002) 249 : 1027-1033.
2. Hobart J, J Freeman, D Lamping, R Fitzpatrick, A Thompson "The SF-36 in multiple sclerosis: why basic assumptions must be tested" *J Neurol Neurosurg Psychiatry* 2001;71:363-370.

Pilot analysis of the measurement properties of CRS-R (coma recovery scale-revised): a rasch analysis study

S. Caselli¹, A.B. Ianes², M.V. Lino³, A. Sighinolfi³, M. Breschi³, A.M. D'Avanzo³, I. Dine³, P. Pacini³, A. Fedi³, M. Pellegrino⁴, F. Fabiano⁴, F. La Porta¹

¹Rehabilitation Unit, "Nuovo Ospedale Civile" di Modena (Italy).

²Direzione medica Gruppo Segesta Milano (Italy).

³Casa di Cura Villa delle Terme Gruppo Segesta Impruneta-Firenze (Italy).

⁴Casa di Cura S.Giuseppe Gruppo Segesta U.O. di Neuroriabilitazione Roma (Italy).

Introduction. Coma Recovery Scale Revised (CRS-R) is a 6-item scale designed to distinguish patients emerging from the Vegetative State (VS) and, respectively, the Minimally Conscious State (MCS) by integrating neuropsychological assessment with clinical assessment. According to its developers, it includes the current diagnostic criteria for coma, VS and MCS allowing to assign each patient to the most appropriate diagnostic category¹. The goal of this study was to test whether raw scores of CRS-R satisfied criteria for interval-level measurement using Rasch Analysis². **Materials and methods.** Data were collected within the pilot stage of a multicenter observational study involving VS and MCS patients during admission to two rehabilitation facilities. For these analyses, a sample of 111 observations (37 patients) was chosen. The following four scaling requirements were checked: correct ordering of score categories, unidimensionality, local independence, invariance. **Results.** CRS-R did not show to fit the Rasch Model in its original form in view of the presence of disordered score categories for one item (visual scale). After rescaling that item, the final solution obtained fitted the Rasch Model. Reliability, expressed as person separation index, was 0.859. **Conclusion.** Given the limitations due to sample size, the CRS-R appeared to satisfy criteria for interval-level measurement following the rescaling of one item. However, its sub-optimal reliability may affect negatively its precision in detecting emergence of individual subjects from VS and MCS. The clinical and research implications of these results are discussed.

References

1. Kalmar K, Giacino JT. The JFK Coma Recovery Scale—Revised. *Neuropsychol Rehabil* 2005;15(3-4):454-60.
2. Tesio L. Measuring behaviours and perceptions: Rasch analysis as a tool for rehabilitation research. *J Rehabil Med* 2003;35(3):105-15

Pilot analysis of the measurement properties of EFA (early functional abilities): a rasch analysis study

M. Lino¹, S. Caselli², A.B. Ianes³, M. Breschi¹, A. Sighinolfi¹, A.M. D'Avanzo¹, I. Dine¹, P. Pacini¹, A. Fedi¹, L. Perez¹, A. Puccetti¹, A. Bracali¹, E. Bagni¹, P. Greco¹, M.G. Pellegrino⁴, F. La Porta²

¹Casa di Cura Villa delle Terme Gruppo Segesta Impruneta-Firenze (Italy).

²Rehabilitation Unit, "Nuovo Ospedale Civile" di Modena (Italy).

³Direzione medica Gruppo Segesta Milano (Italy).

⁴Casa di Cura S.Giuseppe Gruppo Segesta U.O. di Neuroriabilitazione Roma (Italy).

Introduction. Early Functional Abilities (EFA) is a scale created in 1996 in Germany and Switzerland as an interdisciplinary assessment tool for patients emerging from Vegetative State (VS) and Minimally Conscious State (MCS). The main goal of this scale was to describe and measure "early" clinical changes not detected by commonly used outcome measures such as LCF, FIM and DRS in the Rehabilitation setting¹. The goal of this study was to test whether EFA raw scores satisfy criteria for interval-level measurement using Rasch Analysis². **Materials and methods.** Data were collected within the pilot stage of a multicenter observational study involving VS and MCS patients during admission to four different rehabilitation facilities. For these analyses, a sample of 186 observations collected amongst 62 patients was chosen. The following four requirements were checked: correct ordering of response categories, unidimensionality, local independence and invariance. **Results.** In order to achieve a 15-item final fitting solution, 8 items of EFA had to be rescored and 5 items had to be deleted (vegetative stability, awareness/fatigability, postures, swallowing, tone). Reliability was very good (0.934 PSD). However, targeting was hampered by the presence of floor effect (18%). **Conclusion.** Given the limitations due to sample size, the EFA scale appeared to satisfy criteria for interval-level measurement, although substantive changes to its original structure in terms of scoring and item content had to be made. In view of the

presence of floor effect, its clinical usability may be reduced in Vegetative State patients. The clinical implications of these results are discussed.

References

1. Heck G, Schonberg JL. Early Functional Abilities EFA: eine Scala für die evaluation von klinischen zustandsbild und verlauf bei patient mit schweren cerebral schädigungen. *Neurol Rehabil* 1996;4.
2. Tesio L. Measuring behaviours and perceptions: Rasch analysis as a tool for rehabilitation research. *J Rehabil Med* 2003;35(3):105-15.

Pilot analysis of the measurement properties of comanear coma scale, glasgow coma scale, locfas and disability rating scale: a rasch analysis study

A. Sighinolfi¹, S. Caselli², A.B. Ianes³, M. Lino¹, M. Breschi¹, I. Dine¹, A.M. D'Avanzo¹, P. Greco¹, P. Pacini¹, A. Fedi¹, L. Perez¹, A. Puccetti¹, A. Bracali¹, E. Bagni¹, M.G. Pellegrino⁴, F. Fabiano⁴, F. La Porta²

¹Casa di Cura Villa delle Terme Gruppo Segesta Impruneta-Firenze (Italy).

²Rehabilitation Unit, "Nuovo Ospedale Civile" di Modena (Italy)

³Direzione medica Gruppo Segesta Milano (Italy).

⁴Casa di Cura S.Giuseppe Gruppo Segesta U.O. Neuroriabilitazione Roma (Italy).

Introduction. Coma Near Coma (CNC), Glasgow Coma Scale (GCS), LOCFAS (a scale including a checklist of the first five narrative levels of LCF) and Disability Rating Scale (DRS) are some of the tools used worldwide to assess emergence from Vegetative State (VS) and Minimally Conscious State (MCS). The goal of this study was to test whether raw scores from these scales satisfy criteria for interval-level measurement using Rasch Analysis¹. **Materials and methods.** Data were collected within the pilot stage of a multicenter observational study involving VS and MCS patients during admission to two rehabilitation facilities. For these analyses, a sample of 111 observations (37 patients) was chosen. The following four requirements were checked: correct ordering of response categories, unidimensionality, local independence and invariance. **Results.** In their original forms, none of the tested scales appeared to satisfy the Rasch Model (RM) requirements for fundamental measurement and had to be modified accordingly. For all of these scales it was possible to achieve a final solution fitting with the Rasch Model. Particularly, modifications of the original scoring were needed for most of the scales whereas 2 items had to be deleted for CNC. Reliability, expressed as PSI, was suboptimal for all scales, ranging from 0.580 for CNC to 0.119 for GCS. With regard to targeting, CNC and LOCFAS showed, respectively 10% of floor effect and poverty of score thresholds. **Conclusion.** Given the limitations due to sample size, this study suggests that the psychometric profile of these scales is negatively affected by their poor reliability and/or poor targeting. As a consequence, the usage of these individual scales may not be recommended for individual patients' clinical assessment.

References

1. Tesio L. Measuring behaviours and perceptions: Rasch analysis as a tool for rehabilitation research. *J Rehabil Med* 2003;35(3):105-15

Pilot analysis of the measurement properties of an item bank for low-awareness patients: a rasch analysis study

A.B. Ianes¹, S. Caselli², M. Lino³, M. Breschi³, A. Sighinolfi³, I. Dine³, A.M. D'Avanzo³, P. Greco³, L. Perez³, A. Puccetti³, A. Bracali³, E. Bagni³, M.G. Pellegrino⁴, F. Fabiano⁴, F. La Porta²

¹Direzione medica Gruppo Segesta Milano (Italy).

²Rehabilitation Unit, "Nuovo Ospedale Civile" di Modena (Italy)

³Casa di Cura Villa delle Terme Gruppo Segesta Impruneta-Firenze (Italy).

⁴Casa di Cura S.Giuseppe Gruppo Segesta U.O. Neuroriabilitazione Roma (Italy).

Introduction. In the companion abstracts, the comparative Rasch Analyses of CRS-R, EFA, CNC, DRS, LOCFAS and GCS showed that none of these scales holds optimal scaling properties for individual patient assessment across the low-awareness states clinical continuum. The goal of this study was to evaluate the possibility to build an item bank by combining items from these tools onto the same scale. **Materials and methods.** Data were collected within the pilot stage of a multicenter observational study involving VS and MCS patients during admission to two rehabilitation facilities. The following scale were co-administered to a cohort of 37 patients: GCS,

CNC, CRS-R, LOCFAS (all pertaining to the ICF domain "Body Functions") and EFA and DRS for the "Activities and participation" domain of ICF. All scales were administered in three different occasions making a total of 111 observations available for analysis. Items from these scales were pooled together and analyzed with Rasch Analysis in order to compare the scales' operational ranges and for item banking purposes. **Results.** The comparison of the operational ranges of the scales showed that CNC was the easiest scale whereas DRS was the most difficult one. After rescoring 50% of items and deleting 20 items, a final 30-item final solution satisfying the RM requirements was obtained. Reliability (PSI) was 0.92 and targeting was very good with no floor effect. **Conclusion.** Given the limitation due to sample size, the results of this pilot analysis suggest that by pooling items from CRS-R, EFA, CNC, DRS, LOCFAS and GCS, it may be possible to build an item bank for low-awareness patients with a psychometric and clinimetric profile superior to that of the originating scales. The clinical and scientific implications of these findings are discussed.

References

1. Tesio L. Measuring behaviours and perceptions: Rasch analysis as a tool for rehabilitation research. *J Rehabil Med* 2003;35(3):105-15

Functional Assessment of Young Adults in Nursing Homes

F. Anwar, A. Al-Khayer, C. Roy

Physically Disabled Rehabilitation Unit, Southern General Hospital, Govan, Glasgow UK

Introduction. Due to the closure of a nursing home in Glasgow social services struggled to place the young physically daisabled adults in suitable accommodation. It was also felt that rehabilitation and care needs might have changed during their stay at the nursing home. Hence, they requested functional assessment of the residents.

Materials and methods. Assessment process involved structure interview of the patinet, gathering information from the nursing staff, reviewing their clinical notes and drug karex. Functional assessment was based on Northwick Park Dependency Score, Northwick Park care Need Assessment, Functional Independence Measure (FIM), and Barthel Index. **Results.** Twelve patients were interviewed in the study with a mean age 50. Average stay in nursing homes was 6 years and the most common concomitant condition was alcoholism. Five patients were receiving therapy input from rehabilitation services at the time of review. Six patients had significant spasticity and 4 had pain issues. Planned medical and rehabilitation reviews were rare. Northwick Park Dependency scores of the residents were in the range of 0 to 47 with mean score of 23.9 and median of 24.5. Northwick Park Care Need Assessment (NPCNA) was calculated for each resident based on the Northwick Park Dependency Score. Barthel index scores ranged from 0 to 100 with 4 patients ≥ 90. **Conclusion.** Assessment by rehabilitation services should be the routine before admission to a nursing home and periodically after that. Larger studies, cognitive assessment and nursing needs measurement are also justified in these situation.

References

1. Brown RD, Ransom J, Hass S et al. Use of a nursing home after stroke and dependence on stroke severity: a population based analysis. *Stroke* 1999; 30:924-29.
2. McMillan TM, Laurie M. Young adults with acquired brain injury in nursing homes in Glasgow. *Clinical Rehabilitation* 2004; 18: 132-138.

Efficacy of moderate-intensity exercise program for women with fibromyalgia

R. Sgarlata, R. Magri, G. Scaglione.

U.O.C Medicina Fisica e Riabilitazione, P.O di Biancavilla (CT).

Objective. The aim of this study is to evaluate the effectiveness of individualized exercise program on physical functioning and pain severity in the management of women with fibromyalgia (FM). **Materials and methods.** Fifty women with a primary diagnosis of FM were randomized to a one month individualized moderate-intensity exercise program or to a usual medical treatment (control group). The exercise therapy group (n = 25) had treatment for 4 weeks in addition to their medical treatment. The control group (n = 25) continued to have their medical treatment. Exercise programme consisted of 20 minutes of stretching (10 minutes before and 10 minutes after exercise) and 20 minutes of aerobic exercise three

times for week. We measured symptoms with the Fibromyalgia Impact Questionnaire (FIQ) and the Multidimensional Pain Inventory (MPI) at baseline, immediately after treatment, and at 1 month and 7 months after treatment. **Results.** Exercise group-control mean estimate is derived from a repeated-measures analysis of variance model. Total fibromyalgia symptoms, as measured by the FIQ, were significantly improved in the exercise group compared with the control group during the study period ($P=0.01$). The largest difference in mean FIQ total scores was observed at 1 month in the control and exercise groups ($P=0.007$). Analysis of the MPI showed significant improvement in pain ($P=0.03$) up to 1 month after treatment, but the effect was not statistically significant when the 7-month data were included ($P=0.05$). **Conclusion.** It was concluded that the addition of exercise therapy to medical treatment has beneficial effects in female patients with fibromyalgia.

References

Chakrabarty S, Zoorob R. Fibromyalgia. *Am Fam Physician.* 2007 Jul.
 Busch AJ, et al. Exercise for fibromyalgia: a systematic review. *J Rheumatol.* 2008 Jun; Epub 2008 May.
 Burckhardt CS, et al. The Fibromyalgia Impact Questionnaire: development and validation. *J Rheumatol* 1991.

Efficacy of Constraint Induced Movement Therapy for children with Brachial Plexus Palsy.

R. Sgarlata, R. Magri, G. Scaglione.

U.O.C Medicina Fisica e Riabilitazione, P.O di Biancavilla (CT).

Introduction. Constraint-Induced Movement therapy (CIMT) has been found to be a promising treatment for substantially increasing the use of extremities affected by such neurologic injuries in adults. The objective of this study was to investigate whether a modification of the CIMT in children with brachial plexus palsy (BPP) and a treatment programme of activities was effective in improving function in the upper limb. It was a single-case experimental design using children as their own controls. **Materials and methods.** The modification of the CIMT protocol provided a less invasive method of restraint than in other studies. A structured programme of activities was chosen, including play which is vital for the development of all children. Nine children (age range 18 to 61mo) presenting with BPP were involved in the study. Assessment was at entry to the study and subsequently at 4-weekly intervals. A 4-week baseline period with no hand treatment, control for maturation, was followed by a 4-week treatment period and a second 4-week period with no hand treatment to measure carry-over. Treatment consisted of twice-week 1-hour sessions of structured activities with a therapist and a home programme for non-treatment days. Changes in hand function were evaluated with the Quality of Upper Extremity Skills Test. **Results.** Functional motor improvement was seen throughout the study with statistical significance, using the Wilcoxon signed rank test, of 0.01 after treatment. **Conclusion.** CIMT may be an effective way of treating young children with BPP.

References

Brady K, et al. Constraint-induced movement therapy (CIMT): pediatric applications. *Dev Disabil Res Rev.* 2009.
 Buesch FE et al. Constraint-induced movement therapy for children with obstetric brachial plexus palsy: two single-case series. *Int J Rehabil Res.* 2009 Sep.
 DeMatteo C et al. (1993) The reliability and validity of the Quality of Upper Extremity Skills Test. *Phys Occup Ther Pediatrics.*

Cervical Spine Fractures in Ankylosing Spondylitis

F. Anwar, A. Al-Khayer, M. Fraser

Southern General Hospital, Govan, Glasgow, United Kingdom

Introduction. Spinal fractures are very common after a trivial trauma in patients with long-standing ankylosing spondylitis (AS) due to spinal rigidity. The patient due to the long-standing pain may ignore the symptoms of the fracture and the attending clinician can easily miss the fractures due to difficult imaging of the cervical spine secondary to distorted anatomy, ossified ligaments and artefacts. All these factors can lead to a delay in early diagnosis and associated poor prognosis. **Materials and methods.** Retrospective study of all patients with ankylosing spondylitis and cervical spine fracture admitted over an eight-year period at Queen Elizabeth National Spinal Injuries Unit, Scotland. Patients were identified from the database and data was collected from the clinical case notes. **Results.** Total of 26 patients reviewed with ankylosing spondylitis and asso-

ciated cervical spine fracture. In 12 patients (46%) a fracture was not identified on initial plain radiographs. Only 6 patients (23%) presented immediately after the injury. Thirteen patients (50%) were neurologically initially intact after the injury, nine patients (34.6%) had incomplete and four patients (15.4%) had complete tetraplegia. **Conclusion.** Cervical spine fractures in patients with long-standing ankylosing spondylitis are common and usually under evaluated. A high index of suspicion for spinal fractures in these patients along with appropriate radiological investigations will help in early diagnosis and prevent the long-term neurological damage associated with these injuries.

References

1. Olerud C, Frost A, Bring J. Spinal fractures in patients with ankylosing spondylitis. *Eur Spine J* 1996;5(1):51-55.
 2. Gran JT, Skomsvoll JF. The outcome of ankylosing spondylitis. *British Journal of Rheumatology* 1997;36:766-771.

Effects of a weight-bearing exercise training on bone mineral density and neuromuscular function of osteopenic women

D. Marchese, M. D'Andrea, V. Ventura, T. Montalcini, D. Foti, A. Pujia, E. Gulletta, M. Iocco

Università Magna Graecia di Catanzaro

Introduction. The study enrolled 22 women aged between 45 and 65, with densitometric diagnosis of osteopenia. The scope of work is to evaluate whether a weight-bearing exercise training played 3 times a week can have benefits on bone mineral density and neuromuscular function in women with a diagnosis of osteopenia. **Materials and methods.** The participants were randomly assigned to a group of exercise (n = 11) and a control group (n = 11). The exercise program lasted for 45 minutes and consisted of a combination of strength exercises that seek to cause a mechanical osteoblastic stimulus by use of gravity, body weight, fall with anti-gravity reaction, in combination with exercises for the improvement of balance and coordination. The outcome measures used to assess the result on bone mass are the bone Mineralometric DEXA method for femoral head-neck region and lumbar spine and biochemical markers of bone turnover (resorption and neof ormation) and for the evaluation of neuromuscular function was chosen to use surface electromyography (sEMG) as an indicator of overall activity and speed activation of lumbar paravertebral muscles and of the lower limbs antigravity muscles, stabilometric analysis and 6' Walk Test. In addition to each person enrolled was given EuroQol and ICF core set of osteoporosis, respectively, to assess the quality of life, as well as activity limitations and participation restrictions associated. **Result and conclusion:** Results of the study are currently being worked out with analytical methods, and will be presented and discussed during the congress.

References

1. Evaluation of the patient with newly diagnosed osteoporosis. *New Dimensions in Osteoporosis* 1(3):2-5, 1999
 2. Smith EL, Raab DM: Osteoporosis and physical activity. *Acta Med Scand Suppl*, 1986;711:149-56.
 3. Block EJ, Black D, Genant HK: Exercise and osteoporosis. *JAMA*, 1988; 259:47.
 4. Aloia JF: Exercise and skeletal health. *J. Am Geriatric Soc*;1981; 29: 104-7.

Re-education based on midline trunk perception in chronic low back pain: a single blind controlled trial

T. Paolucci¹, E. Spadini³, A. Fusco², M. Iosa², G. Morone², R. Alciri¹, S. Paolucci², V. M. Saraceni⁴

¹Complex Operative Unit of Physical Medicine and Rehabilitation, Policlinico Umberto I, Sapienza University of Rome

²Movement and Brain Laboratory, Fondazione Santa Lucia I.R.C.C.S.

³UOC Riabilitazione Neuromotoria, Azienda Complesso Ospedaliero San Filippo Neri, Presidio Ospedaliero "Salus Infirmorum"

⁴II Facoltà di Medicina e Chirurgia, Azienda Ospedaliera S. Andrea, UOS Medicina Fisica e Riabilitativa, Sapienza Università di Roma

Introduction. Chronic low back pain (CLBP) is considered a serious problem in industrial area for the economic burden and the daily work lose. It can be related to a dysfunction of midline trunk perception and trunk muscle reaction to forces. The representation of the trunk midline in somatic sensory area is well documented. The aim of this study is to investigate the effect of a rehabilitation based on midline trunk perception in patients with aspecific CLBP.

Materials and methods. Thirty eligible patients were randomly allocated into 2 groups. One group (n=15) received ten sessions of rehabilitation in which the patient was positioned on a surface formed by 105 latex deformable cones (Ø=5cm, h=4-5cm). Control group received medical assistance (n=15). Medication was the same in both groups. Waddell Index (WI), Oswestry Disability Index (ODI), Visual Analogic Scale (VAS) and McGill Pain questionnaire (MCG) were collected at baseline (T0), at the end of treatment (T1) and at one month follow-up (T2). **Results.** VAS- and MCG-scores significantly improved after treatment (p<0.05, Friedman analysis) becoming significantly different from control group scores (p<0.01 at T1 and T2, Mann Whitney u-test). Also ODI- and WI-scores significantly improved after treatment (p<0.05), however not enough to significantly differ from the control group scores (but ODI at T2, p=0.026). **Conclusion.** The re-education of midline perception in people with CLBP has shown positive effects on pain perception, maintained after one month follow-up. Some positive effects in disability reduction were obtained only in long term.

References

Fabri et al. Bilateral Cortical Representation of the Trunk Midline in Human First Somatic Sensory Area. *Hum Brain Mapp* 25:287-296, 2005.

Rehabilitation of cancer breast patients after surgery: disability and health-related quality of life

T. Paolucci¹, R. Alcuri¹, A. Scappaticci¹, G. Fratocchi¹, C. Tirelli², V. Santilli¹, V.M. Saraceni¹

¹Complex Operative Unit of Physical Medicine and Rehabilitation, Policlinico Umberto I, Sapienza University of Rome, Rome, Italy

²Department of Gynecology, San Carlo di Nancy Hospital, Rome, Italy.

Introduction. The aim of this study is to investigate the effects of shoulder rehabilitation and compressive bandaging in cancer breast women after surgery. **Materials and methods.** Twenty four women (medium age 58 ± 16,5) were enrolled in our study after surgery for breast cancer. They received 10 sessions of shoulder rehabilitation in groups of five people (2 times a week) and three of them received 8 sessions of lymphoforte compressive bandaging for lymphedema. An informed written material was given to participants with more explanations. Disability of the Arm, Shouddelder and Hand questionnaire (DASH), State-Trait Anxiety Inventory (STAI), Hamilton Rating Scale for Depression (HRSD), Costant Scale (CS), Body Image Scale (BIS), Core Quality of Life Questionnaire (EORTC QLQ C-30), Short Form-36 Health Survey (SF-36) were collected at baseline (T0), at the end of treatment (T1) and at three month follow-up (T2). **Results.** HRSD, STAI, CS, DASH, EORTC significantly improved after treatment (p<0.05, Wilcoxon analysis). SF-36 significantly improved for physical function, physical role, bodily pain, social function, mental health. No significantly different for BIS. **Conclusion.** Exercise for the oncology patients is an important aspect in the overall care of the patients. Rehabilitative treatment can improve not only the functional of the shoulder but the psychological aspects too. The improvement of SF-36 and EORTC describe the principle outcomes of our study.

References

1. Springer BA, Levy E, McGarvey C, Pflazer LA, et al. : Pre-operative assessment enables early diagnosis and recovery of shoulder function in patients with breast cancer. *Breast Cancer Res Treat.* 2010 Feb;120(1):135-47.
2. Devoogdt N, Van Kampen M, et al.: Different physical treatment modalities for lymphoedema developing after axillary lymph node dissection for breast cancer: A review. *Eur J Obstet Gynecol Reprod Biol.* 2010 Mar;149(1):3-9. Epub 2009 Dec 16.

The Post-graduate Medical Schools in Physical and Rehabilitation Medicine. Present situation in Italy.

M. Postiglione¹, F. Sirico², L. Tucci², A. Fusco³

¹Postgraduate Medical School in Physical and Rehabilitation Medicine, University of Florence

²Postgraduate Medical School in Physical and Rehabilitation Medicine, Second University of Naples

³IRCCS Fondazione Santa Lucia, Rome

Background. In Italy there are 31 post-graduate medical schools (PGMS) in Physical and Rehabilitation Medicine (PRM). The study program follows the compulsory guidelines contained in statutory instruments leaving the details of implementation to single universities. Enrollment is subject to admission exam (valid for a specific

school, held on same date in all schools) and to number of available posts. Candidate requirements are: recognized medical degree and Italian license to practice. In Italy there are almost 480 post-graduate PRM students (87% with employment contract for specialist training), all pay university fees (1.200 - 2.000 euro per year). The 1995 Decree stated: duration of course (4 years), hours of lectures (at least 200), subjects to be taught, activities to be carried out during internship and distribution of internship in following wards: 6 months in orthopedics, 6 months in neurology, one whole year in 10 different specialistic departments (ex: ER, internal medicine, pediatrics, cardiology, pulmonology, urology) and remaining time in PRM wards and outpatient clinics. Each school has the responsibility to identify a tutor for guidance of students during the training period. The school can also authorize a period of attendance abroad. In 2005 a new Decree was released (implemented in academic year 2008/2009) organizing all PGMS in 3 areas further divided in groups. PRM schools are in the Clinical Services Area in a group together with Anesthesiology, Toxicology and Audiology. Training and educational activities have been standardized into Credits (in Italian called CFU). Every PRM student is expected to acquire 300 CFUs in 5 years of training. The decree completes and expands the previous guidelines including training objectives and related educational pathways defining training activities and related CFU.

References

Decreto Ministeriale 11 maggio 1995

Decreto Ministeriale 1 agosto 2005 Supplemento ordinario n. 176 alla Gazzetta Ufficiale 5 novembre 2005 n.285.

Bone turnover markers and bone mineral density after Parathyroid Hormone treatment in women with osteoporosis

I. Barca-Fernandez, C. Cuenca, K. Mendez, R. Vacas, F. Pascual.

Rehabilitation Service. Hospital Clinico. Madrid. Spain

Introduction. Remodelled bone is the result of formation and resorption. Can be valued indirectly by determination of biochemical turnover markers (proteins synthesized for osteoblast and osteoclast and products of formation or degradation of type I collagen). PTH is an anabolic agent for osteoporosis treatment. **Aims.** To determine changes in bone turnover markers and bone mineral density (BMD) after 18 months with injected PTH calcium and vitamin D treatment. **Materials and methods.** 10 women with osteoporosis. Evaluated age, risk factors, pain, type of fractures, BMD and biochemical urinary and serum turnover markers: phosphatase alkaline total (PAT), bone alkaline phosphatase (PAO), Urinary Calcium (CAu), phosphatase acid tartrato resistant (PATR) and free urinary deoxipiridolin (DPIR) before and after treatment. **Results.** Median age 72 (IR 70,76) yr, 80 % family precedents, 90 % multiple vertebral fractures. After treatment improved BMD hip: median (IR) -2.5 (1.2, 3.1) to -1.5(1, 2.3) and lumbar -2.9(2.6, 3.1) to -2.5(2.3, 2.8) (p<0.05). Markers were (medium (IR)): PAO: 16 (9, 23) to 14.6 (11, 16), PAT: 3.4 (3.2, 4.4) to 3.9, CAu: 5.2(3.3, 9.1) to 4.6 (2.6, 6.4), PATR: 2.8 (2.4, 2.8) to 2.7 (2.4, 2.9) and DPIR: 20,3(12,37) to 23 (18, 35). Control of pain was 60 %. They found neither complications nor new fractures. **Conclusion.** The bone turnover markers can be used to identify alterations of bone metabolism and evaluation the response to PTH.

References

1. Short-Term Changes in Bone Turnover Markers and Bone Mineral Density Response to Parathyroid Hormone in Women with Osteoporosis. D.Bauer, P. Garnero.
2. Marcadores bioquímicos del remodelado óseo. Aplicabilidad clínica. Álvarez L, Peris P.

Results of a program of complex physical therapy and our domiciliary guidelines in patients with linfedema

I. Barca-Fdez, L. Garcia, L. Platas, S. Gonzalez, C. Hernandez, P. Diaz, F. Pascual.

Rehabilitation Service. Hospital Clinico San Carlos. Madrid. Spain

Introduction. The lymphedema (LD) is defined as an anormal increase of rich proteins liquid in the intermediate space due to an alteration of the capacity of transport of the lymphatic system. The etiology use to be node dissection surgery or radiation. Once established, the treatment is based practically on averages of rehabilitation. **AIM:** To evaluate the evolution of lymphedema after physical therapist treatment and our exercises and domiciliary advices poster.

Materials and methods. We use our protocol of linfedema that includes age, location, time of evolution, reason, complications, stadium and circumference measures. Evolution is valued after treatment by Complex Physical Therapy (advices, kinesiterapy, lymphatic drainage, pneumatic pressure, bandages and measures of containment). **Results.** 34 women with lymphedema. Overage 57 (10.7) yr, median evolution time: 36 (12, 60) months. Following treatment for breast cancer (73.5%) and uterus (17%). 94% Estadium 2 (44% 2A). Most complication was pain (53%). After treatment (97% drainage, plus pneumatic 23%, 85% compression pumps and 38% drugs), decrease circumference measures ($P < 0.05$), stadium (60% 2A) and complications (none: 79%, pain: 12%). **Conclusion.** The domiciliary advices and the Physical Therapy are fundamental to diminish the volume, minimize the symptoms and to avoid the progression and the complications in patients with linfedema.

References

1. Rehabilitation of the linfedema. Update and protocol. Service of Physical Medicine and Rehabilitation. Valldeorras's Regional hospital. April, 2008.
2. Physical therapist management of lymphedema following treatment for breast cancer: a critical review of its effectiveness. A. Megens, S. Harris

Stress Ulcers: Management and Outcome in Spinal Injuries Unit

F. Anwar, M. Purcell

Southern General Hospital, Govan, Glasgow, United Kingdom

Introduction. The incidence of clinically important bleeding form stress ulceration has declined with advances in the resuscitation and management of spinal cord injured patients. The aim of this study was to review our practice of stress ulcer prophylaxis after spinal cord injury and to identify any preventable factors for stress ulcer bleeds in such patients. **Materials and methods.** Retrospective review of case notes of all the patients admitted to Queen Elizabeth Spinal Injuries Unit from January 2006 to May 2008. Data was collected from the clinical notes. **Results.** A total of 19 patients had clinically significant bleeding from the stress ulcer during the study period. There were 2 females and 17 males with a mean age of 51.2 years. Cervical spine injury was the most common occurring in 63.1% of cases. 8(42.1%) underwent endoscopic treatment and 3(15.7%) patients underwent laprotomy. There was one (5.2%) mortality associated with major stress ulcer bleed. **Conclusion.** Stress ulcerations are very common in patients with spinal cord injury. Active bleeding of stress ulcer during rehabilitation period delays the process of rehabilitation and is also associated with significant morbidity and mortality. Pre-existing gastric disease, high spinal cord lesions, ASIA C paralysis and associated multiple injuries are the major risk factors for stress ulcer bleeding. Proper prophylaxis, careful monitoring and aggressive management of active bleeding improve the outcome.

References

1. Cook DJ, Reeve BK, Guyatt GH, et al. Stress ulcer prophylaxis in critically ill patients: resolving discordant meta-analysis. *JAMA.* 1996;275:208-314.
2. Cook DJ, Fuller HD, Guyatt GH et al. Risk factors of gastrointestinal bleeding in critically ill patients. Canadian Critical Care Trials Group. *N Eng J Med.* 1994;330:357-381.

Cervical Spine Fractures in Ankylosing Spondylitis

F. Anwar, A. Al-Khayer, M. Fraser

Southern General Hospital, Govan, Glasgow, United Kingdom

Introduction. Spinal fractures are very common after a trivial trauma in patients with long-standing ankylosing spondylitis (AS) due to spinal rigidity. The patient due to the long-standing pain may ignore the symptoms of the fracture and the attending clinician can easily miss the fractures due to difficult imaging of the cervical spine secondary to distorted anatomy, ossified ligaments and artefacts. All these factors can lead to a delay in early diagnosis and associated poor prognosis. **Materials and methods.** Retrospective study of all patients with ankylosing spondylitis and cervical spine fracture admitted over an eight-year period at Queen Elizabeth National Spinal Injuries Unit, Scotland. Patients were identified from the database and data was collected from the clinical case notes. **Results.** Total of 26 patients reviewed with ankylosing spondylitis and associated cervical spine fracture. In 12 patients (46%) a fracture was not identified on initial plain radiographs. Only 6 patients (23%) presented immediately after the injury. Thirteen patients (50%) were neurologically initially intact after the injury, nine patients (34.6%) had

incomplete and four patients (15.4%) had complete tetraplegia. **Conclusion.** Cervical spine fractures in patients with long-standing ankylosing spondylitis are common and usually under evaluated. A high index of suspicion for spinal fractures in these patients along with appropriate radiological investigations will help in early diagnosis and prevent the long-term neurological damage associated with these injuries.

References

1. Olerud C, Frost A, Bring J. Spinal fractures in patients with ankylosing spondylitis. *Eur Spine J* 1996;5(1):51-55.
2. Gran JT, Skomsvoll JF. The outcome of ankylosing spondylitis. *British Journal of Rheumatology* 1997;36:766-771.

Inpatient rehabilitation in hemophilic patients after major orthopaedic surgery: characteristics and management

G. Zambelan¹, T. Viliani¹, M. Innocenti², M. Morfini³, P. Pasquetti¹

¹*Recovery and Rehabilitation Agency, University Hospital Careggi, Florence Italy*

²*Orthopaedic University Clinic, University Hospital Careggi, Florence Italy*

³*Agency for Haemophilia, University Hospital Careggi, Florence Italy*

Introduction. Hemophilic patients (HP) are characterized by severe functional deficit related to hemophilic arthropathy (HA). Nowadays total joint replacement is a safe treatment in end-stage HA. Several researches report positive long-term results, especially on pain and quality of life, nevertheless thorough studies about post-acute rehabilitation in major orthopaedic surgery for HP are still lacking and rehabilitation in this phase is a challenge for physiatry. Our work wants to give a contribute in this field. **Materials and methods.** This is an observational retrospective study. We analyzed a consecutive series of HP hospitalized in our rehabilitation unit after major orthopaedic procedures during 6 years. Our assessment includes main characteristics and specificity of this group of patients and their multidisciplinary management. **Results.** From January 2004 to February 2010 39 HP were hospitalized in the Rehabilitation Unit of University Hospital Careggi (Florence) after 41 orthopaedics procedures (21 primary total knee arthroplasty (TKA), 6 revised TKA, 6 total hip arthroplasty (THA), 3 revised THA, 2 synovectomies, 2 arthrodesis, 1 osteosynthesis). The mean age at time of surgery was 39,1 years, mean hospitalization time was 16,1 days, mean distance from surgery was 14,2 days. Complications were 1 haemarthrosis, 1 haematuria 1 and 1 muscular haematoma. **Conclusion.** We found that HP are younger than individuals requiring analogous orthopaedic surgery, they have more severe functional impairment due to several joints involvement and flexion contractures, they need a longer mean hospitalization, and they need an individualized treatment protocol according to their musculoskeletal status. More details will be discussed in the congress session. Nevertheless intensive post-acute rehabilitation is feasible, safe and effective providing skilled operators and multidisciplinary approach with close collaboration between haematologist, orthopaedic surgeons, rehabilitation physicians and physiotherapists.

References

- Rodriguez-Merchan EC. *Thromb Haemost.* 2003 Jan;89(1):34-42.
De Kleijn P et al. *Haemophilia.* 2006 Jul;12 Suppl 3:108-12.

High Intensity Laser Therapy (HILT) in Knee Osteoarthritis patients: preliminary results

C. Martini, T. Viliani, M. Monici, P. Pasquetti

Recovery and Rehabilitation Agency, University Hospital Careggi, Florence, Italy

Introduction. High Intensity Lasertherapy (HILT) in Knee Osteoarthritis (KO) is establishing as good antalgic treatment. Pulsed Nd:YAG laser is characterized by high peak power, short pulse duration (100-200 msec), low pulse frequency (10-40 Hz), 1% duty cycle, wavelength 1064 nm; it supplies high energy levels avoiding thermal damage. In-vitro studies on endothelial and connective tissue cells exposed to pulsed Nd:YAG laser (high energy levels) revealed possible improvement in tissue function, restoring tissular repair processes and homeostasis mainly through stimulation of inflammatory cytokine pathway. Starting from in-vitro findings and previous good clinical results, aim of this work is to study the effectiveness of a specific high energy HILT protocol in KO. **Materials and methods.**

Outpatients with OA were included (Kellgren grade II-III). Evaluation timing was T0 (beginning) and T1 (after 15 daily sessions) by WOMAC score. Treatment was performed with HILTherapy, Hiro 3.0. **Results.** We examined 4 patients, (6 knees total). Mean age: 66,25 years (range 60-73). Mean WOMAC T0: 50,6 points (range 42-62). Mean WOMAC T1: 20,0 points (range 13-30). After treatment patients showed clear improvement of pain and function. No side-effect was reported. Statistical analysis was not feasible due to the scarceness of patients. More details will be analyzed during the congress. **Conclusion.** Our results are preliminary, and the scarceness of patients doesn't allow a definitive opinion. Nevertheless, clinical effects were very evident. This encourage to continue our work. High Intensity Lasertherapy in KO could be a good instrument in long-lasting management of KO patients, both as a pain-releasing treatment and maybe as a modifying factor of KO's natural history.

References

1. Basile V. et al.. Microgravity Sci. Technol ., 21: 151-157, 2009.
2. Valent A. Atti 2° Convegno Nazionale Dominare l'energia 6-7-8 giugno 2007.

Bilateral patellar tendon rupture in a patient with pioderma gangrenosum: a case report and review of the literature

R. Fiorillo, A. Garcia-Cruz, C. Fernandez-Caamaño, M.V. Lourido-Estevez, M.L. Rey-Pita

Rehabilitation service. Complejo Hospitalario de Pontevedra. Pontevedra. Spain

Introduction. Simultaneous bilateral patellar tendon ruptures are extremely rare injuries of the knee extensor complex often associated with systemic disease, such as renal failure, rheumatoid arthritis, lupus erythematosus and hyperparathyroidism. The clinical characteristic is the sudden loss of knee extension and pain. The bilateral nature of the injury can difficult the progress in rehabilitation program. Only one detailed guidelines report for postoperative physiotherapy is present in the literature. **Case report.** A 34-year-old woman with a 13-year history of Pioderma Gangrenosum treated with pulses of prednisone. In November 2009 she experienced a sudden fall and pain in both knees while she was walking. At presentation to the emergency department the physical examination and the radiographic assessment confirmed the diagnosis of bilateral patellar tendon rupture. Patellar tendons were surgically repaired five days after the diagnosis and the patient was referred to the Rehabilitation Department in January 2010. **Discussion.** Approximately 50 cases of simultaneous bilateral patellar tendon rupture are reported in the literature. The usual mechanism of lesion is a sudden flexion of the knee coinciding with contraction of the quadriceps. The inflammatory changes, collagen necrosis and local or systemic administration of steroid have been proposed as possible causes of structural abnormalities of the patella tendon. Only one case report has focused on the rehabilitation program. Early physical therapy helps the patient to return sooner to the normal activities.

References

- Bilateral patellar tendon rupture without predisposing systemic disease or steroid use: a case report and review of the literature. Kellersmann R, Blatter TR, Weckbach A. Arch Orthop Trauma Surg. 2005 Mar;125(2):127-33.
- Insidious bilateral infrapatellar tendon rupture in a patient with systemic lupus erythematosus. Cooney LM Jr, Aversa JM, Newman JH. Ann Rheum Dis. 1980 Dec;39(6):592-5.
- Bilateral simultaneous infrapatellar tendon ruptures: a case study. Noteboom JT, Lester MN. J Orthop Sports Phys Ther. 1994 Sep;20(3):166-70.

Comparison of physical therapy modalities and neuromuscular electrical stimulation (NMES) on hemiplegic upper limb rehabilitation.

Fatih Baygutalp, Kazım Şenel.

Atatürk University, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Erzurum, Turkey.

Introduction. This study aimed to investigate additional benefits of combine application of conventional physical therapy modalities and neuromuscular electrical stimulation (NMES) to motor and functional outcome of upper extremity on 30 patients with hemiplegia / hemiparesis. **Materials and methods.** Patients were assigned into two groups, conventional physical therapy modalities and NMES

were performed for group 1 (to shoulder, arm and forearm once in a day for 30 minutes, 5 day in a week, for three weeks), only conventional physical therapy modalities were performed for group 2 (for three weeks). To assess efficiency of treatment active ROM at all sides for shoulder; goniometric measure of active flexion for elbow, wrist and 2.3.4. MCF joints, MAS for tonus assesment, VAS for hemiplegic side pain, Brunnstrom's upper limb and hand motor outcome grades for motor outcome, Barthel index for functional outcome were performed. **Results.** As the results of the assesment, both groups had statistically significant improvement (p<0.05) in shoulder active flexion, abduction, adduction, elbow flexion at the end of the first week, the end of three weeks, and the control after 2 months. At the end of the treatment, in NMES group statistically significant improvement (p<0.05) in wrist active flexion, statistically significant decrease (p<0.05) in elbow MAS score, statistically nearly significant decrease (p<0.05) in wrist MAS score were seen. The decrease of hemiplegic side VAS scores was more significant in NMES group than the control group (p<0.05). Comparison of the both groups before treatment, after treatment and after 2 months, statistically significant (p<0.05) increase was recorded on upper limb Brunnstrom and hand Brunnstrom scores . Comparison of the NMES group, the increase of Barthel index score was statistically significant (p<0.05). **Conclusion.** We suggested that in hemiplegic upper limb rehabilitation after stroke, physical therapy modalities and NMES are efficient on ROM, pain, motor and functional outcome. For all that; NMES is more efficient on ROM, spasticity and pain.

References

- Fatih Baygutalp, Kazım Şenel, Comparison of physical therapy modalities and neuromuscular electrical stimulation (NMES) on hemiplegic upper limb rehabilitation.

Study hallux adductor muscle as a functional disorder in morton's. Metatarsalgia

M. Ranieri¹, A.M. Cortese¹, S. Mennuni¹, G. Ianieri¹, R. Marvulli¹, G. Gioia², D. Vittore², G. Megna¹.

¹*Department of Neurological and Psychiatric Sciences Physical Medicine and Rehabilitation*

²*Department of Orthopedic Clinic II, University of Bari "Aldo Moro", Policlinico Piazza Giulio Cesare, Italy*

Introduction. The Morton's Metatarsalgia is a degenerative disease of one or more digital intermetatarsal nerves with often controversial etiology and pathogenesis. Generally affects middle-aged women. The most frequent location is at the level of the third and fourth intermetatarsal space, neuralgia-type pain is particularly intense during walking. The purpose of our study was to investigate the role of the hallux adductor muscle and in particular the transverse beam, which contraction becomes a sign of functional disorder that can be the trigger cause or decrease the pain threshold in the clinical. **Materials and methods.** Patients who have come to our attention with a diagnosis of Morton's Metatarsalgia underwent electromyographic study of muscle group in question. The PUM detected were compared with those of asymptomatic subjects sample. **Results.** From what is reflected in the EMG, it should be emphasized that the contracture of the adductor muscle through the 1st finger, and at the same time contributing cause and effects in exacerbate typical symptoms of Morton's Metatarsalgia. **Conclusion.** This preliminary study lays the foundation, next perineural infiltration and surgical therapy, for a more targeted decontracting therapy.

References

1. An anatomical study of Morton's interdigital neuroma: the relationship between the occurring site and the deep transverse metatarsal ligament (DTML). Kim JY, Choi JH, Park J, Wang J, Lee I. Foot Ankle Int. 2007 Sep;28(9):1007-10.
2. Efficacy of chemical neurolysis for the treatment of interdigital nerve compression of the foot: a retrospective study. Mozena JD, Clifford JT. J Am Podiatr Med Assoc. 2007 May-Jun;97(3):203-6.
3. Metatarsalgia. Differential diagnosis and therapeutic algorithm Fuhrmann RA, Roth A, Venbrocks RA. Orthopade. 2005 Aug;34(8):767-8, 769-72, 774-5.
4. Echography evaluation of Morton's neuroma. Tobajas Asensio E, Tobajas Asensio JA, Boada Apilluelo E, Torres Nuez J. An Med Interna. 2000 Aug;17(8):416-8.

Amelioration of visual extinction in a patient with right-hemisphere damage after left hemisphere bleeding: implication for rehabilitation

V. Varalta^{1,2}, N. Smania^{1,2}, C. Marzi², E. Natale^{2,3}

¹Centro di Ricerca in Riabilitazione Neuromotoria e Cognitiva, University of Verona, Verona, Italy

²Department in Neurological and Visual Science, University of Verona, Italy di

³Department of Psychology, University of Milano Bicocca, Milan, Italy

Introduction. Visual extinction is a neuropsychological syndrome observed more frequently after right- than left-hemisphere damage. It can be considered as a spatio-temporal disorder of conscious perception with impaired processing of stimuli in the contralesional hemifield specifically under conditions of double simultaneous presentation. Thus, in visual detection tasks extinction patients often report the stimulus presented in the ipsilesional hemifield only, whereas in temporal order judgment (TOJ) tasks they perceive this stimulus as coming first even when the contralesional one leads in time by hundreds milliseconds. Here, in order to shed light onto the functional and physiological bases of this disorder we examined case CZ and two control patients. **Materials and methods.** Three patients with right temporo-parietal ischaemic stroke were tested at a chronic stage on (i) a computerised version of the confrontation technique to assess the extinction rate and (ii) a TOJ task to estimate the point of subjective simultaneity (PSS). Patient CZ was also re-tested after evacuation of a left fronto-parietal haematoma occurred 17 years after the onset of the right hemisphere stroke. **Results.** One month before the onset of the left-hemisphere haemorrhage, CZ showed a high extinction rate (60%) and, similarly to a patient with 100% extinction rate, an abnormal PSS with the left stimulus leading in time by about 110 ms the right one. One month after the evacuation of the haematoma, the performance of CZ dramatically improved both on the visual detection and the TOJ task and was comparable to that of a patient without visual extinction. **Conclusion.** These results indicate that in visual extinction the rightwards spatio-temporal bias is likely due to hyperactivation of the fronto-parietal attention network of the intact hemisphere. They also suggest that non-invasive brain stimulation techniques (tDCS, TMS) may be used clinically to ameliorate visual extinction by reversibly interfering with the intact hemisphere.

Caudal regression syndrome, four cases

C. de Miguel Benadiba¹, M. Hernandez Manada¹, A. Gil Agudo²

¹Hospital Universitario Ramon y Cajal Madrid, Spain

²Hospital Nacional de Paraplejicos de Toledo, Spain
Ramon y Cajal Hospital, Madrid, Spain

Introduction. Caudal regression syndrome (CRS) consists of sacral agenesis with variable lower extremity deformities. It manifests as neurological deficit in the lower limbs and neurogenic bladder and bowel. Frequency 1/25000 neonates, it's related with diabetic mothers. Treatment consists of soft kinesitherapy for contractures of the lower extremities, osteotomies and orthotics. **Materials and methods.** We analyze four girls cases of sacral agenesis, the patients deformities and the treatment. A 6year old girl with S1 agenesis, lumbar scoliosis. Equinovarus deformity. Upper limb orthopedic deformities. A 15year old girl with total sacral and partial lumbar agenesis, L3 motor level. Lumbar kyphosis. Equinovarus deformity. A 18year old girl with total sacral and partial lumbar agenesis, L3 motor level, distal sensitive abolished, and mielomeningocele. Lumbar kyphosis. Cavus feet. Upper limb orthopedic deformities. A 14year old girl with total sacral agenesis. Toracolumbar scoliosis. Equinovarus deformity. Hip dislocation. **Results.** The four cases are girls, between 6-18 years, the 50% have lumbar and sacral agenesis, and the other 50% only sacral agenesis. All the patients had a surgical intervention at the lower limbs to get them walking with technical aids. The 50% had an upper limbs intervention to try a functional position. 100% received treatment with a spinal orthosis to strict control the scoliosis evolution. **Conclusion.** The CRS patients need an individual manage of the deformities and prevent the evolution. It's a rare disorder, with different spinal level agenesis and various sensitive and motor deficits. It's important the rehabilitation treatment to keep on the deformities and prevent them.

References

1. Singh, S.K et al. Caudal regression syndrome-case report and review of literature. *Pediatr Surg Int*;2005;21:578-581.
2. Guidera, K.J et al. Caudal regression: a review of seven cases, including the mermaid syndrome. *Journal of Pediatric orthopaedics*;1991;11:743-747.
3. Das, B.B et al. Caudal regression syndrome versus sirenomelia: A case report. *Journal Perinatology* 2002;22:168-170.

Primary Rehabilitation of Spinal Cord Injuries: Our experience

E. Skikic-Mujic, S. Ullattuthodiyil, M.T. Tolin, S. Chandwani, S. Trebinjac, G. Devcecerski

Rashid Hospital, Dubai

Introduction. Annual incidence of SCI patients, worldwide is 15 – 40 per million population. SCI rehabilitation should begin shortly after the onset of SCI. It includes helping the patient to meet the needs in medical, physical, social, emotional, recreational, vocational, and functional recovery. Rehabilitation goals for SCI patients include prevention of secondary medical complications, education and training of the patient and family members and prescription of appropriate medical equipment. **Materials and methods.** Rehabilitation treatment was individualized and goal oriented as per the patients needs, started in general wards and continued in Rehabilitation ward. Length of daily treatment depended of patients' conditions and abilities, started from 30 minutes in General wards to 3 hours in Rehabilitation ward. **Results.** During the period of 6 months, from June 2009 till December 2009, 29 patient with SCI were referred for Rehabilitation management in Rashid Hospital, Dubai – 14 tetraplegic and 15 paraplegic. 11 patients had limited ability for intensive rehabilitation program and they remained in General wards, while other 18 patients were transferred to Rehabilitation ward for comprehensive treatment. Outcome measurements used for evaluation and statistical analysis were ASIA score, Motricity index, Standing balance test, Functional ambulation categories, FIM, bladder management, patients education and prescription of required devices. **Conclusion.** Rehabilitation programs needs to be initiated relatively soon after injury to restore significant function in many of the patients with SCI. Rehabilitation treatment should be individualized, goal oriented and variety of approaches can be used for maximized the function.

References

- Scivoletto G, Morganti B, Molinari M. (2005) Early versus delayed inpatient spinal cord injury rehabilitation: an Italian study. *Arch Phys Med Rehab*, 86:512-16.
- Amin A, Bernard J, Nadarajah R, Davies N, Gow F, Tucker S. (2005) Spinal injuries admitted to a specialist centre over a 5-year period: a study to evaluate delayed admission. *Spinal Cord*, 43:434-7.
- McKinley W, Santos K, Brooke K; Incidence and outcomes of Spinal Cord Injury Clinical Syndromes; *J Spinal Crd Med*. 2007; 30:215-224.
- Lim P, Tow A; Recovery and Regeneration after Spinal Cord Injury: A Review and Summary of Recent Literature; *Ann Acad Med Singapore* 2007;36:49-57.

Hip Pathology in Obstetric Brachial Palsy

R. Sánchez Fernández, A. Lagares Alonso, J.A. Conejero Casares

Department of Physical Medicine and Rehabilitation, Virgen Macarena University Hospital, Seville, Spain.

Introduction. Hip dysplasia is associated with other neonatal pathologies. It makes us considerer the possibility of this pathology in patients with pediatric brachial palsy. **Materials and methods.** The objective of this study is to describe the association between pediatric brachial palsy and hip pathology. All the pediatrics' brachial palsy cases were included, with detailed analysis and diagnostic studies (ultrasound, or radiography) depending on age. Previous information regarding these patients as collar bone fracture, stiff neck symptoms... was also recorded. Of all the 92 cases seen at the hospital, 29,34% had hip symptoms and requested studies to be completed. **Results.** The results were 18,51% hip pelvic obliquity, 22,22% dysplasia, 11,11% immaturity ,37,03% limited abduction, without a any being predominant. In the exploration, the limited adduction and abduction was the main finding, 77,77%, on the opposite, the presence of the pathologic maneuvers (Kliscic, Galeazzi, Ortolani, Barlow) was positive only in two cases. The ultrasound was pathologic in 37%, where as radiography just in one case. The diagnoses was done at large, in the first month of life, 77,77%. **Conclusion.** We found that hip pathology must be considered in neonates with newborn brachial plexus palsy. The abduction and abduction limited in the exploration and the ultrasound are important in the diagnoses

References

- Waters P M. Update on management of pediatric brachial palsy. *J Pediatr Orthop* 2005;25 (1):116-126.
- Bracke B, Magnussen EB, Johansen OJ, Sellaeg G, Russwurm H. Obstetric brachial plexus palsy: a birth injury not explained by the know risk factors. *Acta Obstet Gynecol Scand* 2008;87(10):1027-32.

Treatment outcome evaluation in children with dysfunctional voiding

V. Zivkovic, M. Lazovic, M. Vljakovic, A. Slavkovic
Clinic of Physical Medicine, Rehabilitation and Prosthetics, Clinical Centre Nis, Nis, Serbia. Department of Nuclear Medicine, Clinical Centre Nis, Nis, Serbia. Clinic of Paediatric Surgery, Clinical Centre Nis, Nis, Serbia.

Introduction. Dysfunctional voiding (DV) represents a functional voiding disorder which affects the voiding phase of the micturition cycle. Symptoms vary from mild daytime frequency and urgency, to daytime and night-time wetting, pelvic holding maneuvers, voiding difficulties, urinary tract infections (UTIs), constipation and vesicoureteral reflux. The aim of the study was to compare the treatment outcome of two urotherapy programs through analyzing the clinical manifestations and uroflowmetry parameters. **Materials and methods.** Eighty-six children, mean age 7.1±2.5 years, unimproved by previous therapies, were randomly divided into two groups (group A and group B). Children in both groups were educated about the importance of regular voiding and hydration, and about the appropriate posture during voiding. Simple voiding instructions were provided. In group A pelvic floor muscle (PFM) exercises were additionally assigned to children. Constipation and recurrent UTIs were treated in both groups. Selected children from both groups received pharmacotherapy (anticholinergics or desmopressin). Uroflowmetry with electromyography of PFM and ultrasound residual urine volumes were obtained before and at the end of the 12-month treatment period. **Results.** After one year of therapy urinary incontinence and nocturnal enuresis were cured in a significantly larger number of children in group A than in group B (P<0.001; P<0.05). Although more children with UTIs were cured in group A, the difference was not statistically significant compared to group B. There was a significant recovery constipation-wise in both groups. Post-treatment uroflowmetry parameters such as average flow rate, peak flow rate, flow time, residual urine and curve pattern were markedly improved only in group A. **Conclusion.** Pelvic floor rehabilitation is necessary in the majority of children with DV for the purpose of curing urinary incontinence, nocturnal enuresis, constipation and UTIs. Furthermore, regularly controlled program including PFM exercises leads to normalization of uroflowmetry parameters and curve type.

References

1. Neveus T, Von Gontard A, Hoebcke P, Hjalmas K, Bauer S, Bower W et al. The standardization of terminology of lower urinary tract function in children and adolescents: Report from the standardisation committee of the International Children's Continence Society. *J Urol* 2006;176: 314-24.

Quantitative Effects On Gait Pattern Of Repeated Muscle Vibrations: A 5-Yr-Old Case Study

F. Camerota¹, E. Galli², S. Vimercati², V. Cimolin², N. Tenore³, G.M. Filippi⁴, C. Celletti¹, G. Albertini³

¹*Physical Medicine and Rehabilitation Division, "Sapienza" University, Umberto I Hospital, Rome, Italy.*

²*Bioeng. Dept. Politecnico di Milano, Milano, Italy*

³*IRCCS "San Raffaele Pisana" - Tosinvest Sanità, Roma, Italy*

⁴*Institute of Human Physiology, Catholic University of Rome, Rome, Italy*

Introduction. Cerebral palsy (CP) is the most common cause of physical disability in children. The diplegic form is characterized by difficult in walking commonly treated with physiotherapy, orthoses, Botox-toxin injection. Recently has been demonstrated the capacity of the muscle vibration to activate proprioceptors for the amelioration of motor control networks. We investigated quantitatively and objectively the effects of repeated muscle vibration (rMV) of triceps surae for the reduction of equinus foot deformity due to calf spasticity in a patient with CP. **Materials and methods.** A 5-years old male underwent the rMV treatment and was examined clinically and with gait analysis(GA) before and one month after the treatment . Low-amplitude of focal rMV at a fixed frequency of 100 Hz was applied over the triceps surae muscle over 3 consecutive days for 30 minutes. **Results.** The clinical evaluations showed improvements in particular on the right side; a higher joint excursion and a more symmetric condition were gained after the treatment. Statistically significant improvements were observed in the main joints kinematics. **Conclusion.** This case report demonstrated the positive effects of the rMV application on gait pattern. In particular, GA showed that the effectiveness appeared on all lower limbs joints, not only at the

joints directly involved in the treatment but also at the proximal joints . These results showed that the rMV technique reveals to be a reasonable option for improvement of the gait pattern.

References

1. Marconi B, Filippi GM, Camerota F et al . Long-term effects on motor cortical excitability induced by repeated muscle vibration during contraction in healthy subjects. *J Neurol Sci.* 2008;275:51-9.
 2. Filippi GM, Brunetti O, Camerota F, et al. Improvement of stance control and muscle performance induced by focal muscle vibration in young-elderly women: a randomized controlled trial. *Arch Phys Med Rehabil.* 2009;90:2019-25.

Pain in post-surgical orthopedic rehabilitation: designing and testing a protocol for a multicenter study

F. Cecchi¹, C. Pazzaglia^{1,2}, L. Chiavacci¹, R. Molino-Lova¹, L. Padua^{1,2}

¹*Fondazione Don Carlo Gnocchi Onlus, Italy*

²*Università Cattolica del Sacro Cuore, Istituto di Neurologia, Rome, Italy*

For pain in Rehabilitation Study Group. Participants: M Bacchini (Parma), S Bondi (Sarzana), D Cattaneo (Milano), F De Santis (Roma), M Forni (Sarzana), S Galeri (Rovato), M Maiolatesi (Falconara), C Manenti (Rovato), I Minciotti (Roma)*, A Montesano (Milano), AR Pellegrino (Roma), S Pierani (Falconara), A Popolizio (Firenze), A Romanelli (Firenze), M Rossi (Parma), G Russo (Roma)*.

* *Data entry*

Introduction. Post-surgical orthopedic rehabilitation (PSOR) may be limited by pain, while individual pain tolerance is a key factor in rehabilitation programs. We describe the development and testing of a protocol to characterize pain patients undergoing PSOR in 7 Centres of the Don Gnocchi Foundation, a no-profit rehabilitation institution. **Materials and methods.** The pilot study protocol was tested in the Florence Centre: all patients undergoing PSOR in Sept 2-Oct 9/2010 were eligible. Pain was assessed by visual analogue scale-VAS, and McGill Pain Questionnaire. Sociodemographics and clinical data were also collected. Pain interfering with PSOR and adopted strategies were reported by therapists; eventually, specialist intervention was reported. **Results.** Of the 31 eligible patients (28 inpatients), 4 refusals and 4 cognitive impairments were excluded. Thus 14 women and 9 men, aged 66,4±17,8 were enrolled; 12 were taking pain-killers; 18 reported comorbidity; 13 had hip fracture (11 osteosynthesis, 2 hip arthroplasty); 3 hip and 4 knee arthroplasty for osteoarthritis, 1 tibial and 2 foot fractures. VAS scored 31.65±25.61 and McGill 30,81±11,68. Pain interfered with PSOR in 12/23 patients: approaches included patient education reinforcement (12/12), exercise modification (8/12) and/or interruption (5/12); manual therapy (4/12); instrumental therapy (3/12). Surgeon's consultation was required for 2 patients, 6 patients were referred to resident specialist (4 X-rays, 4 pain-killer prescriptions). All operators found the protocol quick/easy to administer. **Conclusion.** The pilot study confirmed the feasibility of the study protocol. Results were used to develop a general consensus on the final multicentric study protocol, focusing on inpatients with major lower limb surgery.

References

1. Meissner W, Mescha S, Rothaug J et al. Quality improvement in postoperative pain management. Results from the QUIPS Project. *Dtsch Arztebl int* 2008;105:865-70.
 2. Sharma V, Morgan PM, Cheng EY. Factors influencing early rehabilitation after THA. A systematic review. *Clin Orthop Relat Res* 2009;467:1400-1411

Low back pain ICF Core Set validation study

C.E. Fata, M. Iocco

Università degli Studi Magna Graecia, Catanzaro

Aim. Many validation studies of instruments of evaluation derived from ICF are actually in course. The aim of this work was to evaluate the International Classification of Functioning Disability and Health (ICF) Core Set for low back pain and to investigate its feasibility in clinical practice. Comparing data gained using ICF check list with 78 categories proposed by LBP ICF Core Set, were considered the frequency with which LBP patients' problems are reported in the ICF categories included in the Comprehensive ICF Core Set for LBP and the categories that are missing or redundant. **Materials and methods.** Data were collected from November 2008 to January 2010. A total of 79 patients were included in the study. It was right the use of a battery of measures including the SF-36, Functional Independence Measure (FIM), a visual analogue pain scale (VAS),

the Modified Zung Index and the Modified Schrober's Test for Spinal Mobility. Measure systems and The ICF Check list were filled by the same operator. **Results.** Data shows that the ICF Core set for LBP captures the most of the problems of LBP, and adds important aspects to clinical practice in the field of LBP. However, stood out as missing some categories in *Body functions, Body structures, Activities and Participation*. **Conclusion.** The ICF Core Set for LBP needs further elaboration in order to improve the clinical feasibility.

References

A. Cieza et al. ICF Core Set for Low back pain. J Rehabil Med 2004; suppl. 44:69-74.
 Roe C, Sveen U, Bautz-holter E. Testing of ICF core set for low back pain. Tidsskr Nor Laegeforen. 2008;128 (23):2706-8.
 Bautz Holter E, Sveen U, Cieza A, Roe C. Does the International Classification of functioning Disabilities and health (ICF) Core Set for low back pain cover the patients' problems? A cross-sectional content-validity study with a Norwegian population. Eur Phys Rehabil Med 2008; 44: 387-97.

The importance of balneotherapy in the rehabilitation of patients with ankylosing spondylitis

M.D. Pavlovi, N.S. Prodanovi, P.M. Čukanovic

Special hospital for rehabilitation "Bukovička Banja", Arandjelovac

Introduction. Morbus Bechterew is an inflammatory, rheumatic system disease of connective tissue and belongs to the group seronegative arthrospondylitis. A specific laboratory test is the determination of HLA-B27 antigen, which is positive in over 95% of cases. Rehabilitation program includes use of sonic, electro, magnetic, kinesitherapy and hydrotherapy. Mineral water of Bukovicka spa is sodium-hydrocarbonic, carboacid, homoeothermic. The importance and advantages hydrotherapy in the treatment of patients suffering with Morbus Bechterew. **Materials and methods.** We have treated 30 male patients, age between 40 and 70, diagnosed with Morbus Bechterew, in the period 2001-2006 year all the patients have been treated for 21 days and have been classified into 2 groups. The 1st group (15 patients) has been treated with: Ultrasound (1-1,5 W/cm²-5 minutes), interferential currents (1-100Hz/12 min), magnetotherapy (20mT/50Hz/30 min), and kinesitherapy (program for the increase of movement amplitude of vertebral column and peripheral joints, breathing exercises), hydrotherapy (exercises and underwater massage, in the pool with mineral water). The results of treatment have been objectified: Measuring of spinal mobility (Ott test, Schober test) and hips ROM, muscle strength (MMT); subjective feeling of pain (VAS) and chest movement (chest expansion). **Results.** The results have been processed in SPSS programme and presented in charts. **Conclusion.** Hydrotherapy causes decrease of pain, improvement of circulation, and movement facilitation in the damaged joints, decrease of muscle spasm, which produces better locomotorial function.

References

Khan MA. Ankylosing spondylitis: burden of illness, diagnosis and effective treatment J. Rheumatol. 2006; (suppl 78): 1-31. Calin A. Early diagnosis of ankylosing spondylitis. Lancet 1977;2:1293.

Individualized exercise training benefit on hemodynamic parameters in young metabolic syndrome patients

C. Avram¹, M. Oravi,an¹, A. Nagel¹, M. Barzu¹, B. Almajan-Guta², L. Craciun³, C. Adina Avram³

¹West University of Timisoara

²Politehnica University, Timisoara

³Victor Babes University of Medicine and Pharmacy, Timisoara

Introduction. Increased resting heart rate (HR) and high blood pressure (BP) are two important hemodynamic parameters for progression of atherosclerosis. More than this, high systolic blood pressure (SBP) and/or diastolic blood pressure (DBP) are two diagnostic criteria for metabolic syndrome (MS) - a multiple, interrelated risk factors that appear to directly promote the development of atherosclerotic cardiovascular diseases. The present study is aiming to demonstrate the benefit of individualized exercise training on hemodynamic parameters in young patients with metabolic syndrome. **Materials and methods.** We conducted a prospective study of 6 months on 43 young patients (mean age 21.3±3.1 years), previously diagnosed with MS based on ATPIII criteria. All patients performed a cardio-pulmonary exercise testing (CPET) on bicycle ergometer at baseline and at the end of study, in order to assess HR and BP at rest and during exercise. Also, the CPET results allowed us to determine individual

tolerance to exercise and recommend optimal training intensity to each patient. Individualized exercise training programs included aerobic exercises (40 minutes, at least 3 times a week, for 6 months), whose intensity was continually monitored and adjusted using heart rate monitors. **Results.** Using the paired t test to compare the data at baseline and at the end of the study, we noticed a significant improvement in SBP (decreased from 132,8±9,95 to 119,6±8,42 mmHg, p<0.0001) along with HR (decreased from 77±11.8 to 70.5±10.6 b/min, p=0.002) and maximal DBP (decreased from 90,6±6,09 to 88±6,08 mmHg, p=0.02). We also noticed a moderate improvement of DBP and maximal SBP, but they didn't reach statistical significance threshold (p<0.05). **Conclusion.** Individualized exercise training programmes has a positive effect on both effort and resting hemodynamic parameters in young patients with metabolic syndrome. Effort intensity optimization based on CPET results and heart rate monitors, increase patient's safety and compliance to exercise.

References

1. Mancia G, De Backer G, Dominiczak A, et al. Guidelines for the management of arterial hypertension. European Heart Journal (2007) 28, 1462-1536.
 2. Ryden L, Standl E, Bartnik M, et al. Guidelines on diabetes, pre-diabetes, and cardiovascular diseases. European Heart Journal (2007) 28, 88-136.

PRM trainees training in France "European Lecture – PRM trainees Session"

G. Lotito; H. Collado

Pôle de Médecine Physique et de Réadaptation et Médecine du Sport, Hôpital de la Timone, Marseille, France

The French Medical teaching program is organized in 3 parts . During the first couple of these, trainees learn about all medical specialties both with theoretical courses and clinical activities. Six years later, the French medical national exam must be passed by all of the french trainees. Thanks this exam the medical students must decide wich medical speciality they want to learn like PRM for example. In addition, according to their rank the trainees are able to choose in wich city they want to learn. Four years is the total duration of PRM residency including 8 clinical rotations of 6 months in different medical departments: 4 of them in PRM departments, 2 in Neurology, Rheumatology or Podiatry departments and 2 free rotations without obligation.. In several situations the residents are allowed to do 1 or 2 rotations in another city in France. Theoretical national PRM courses are organised by the COFEMER organisation for all of the PRM residents. 250 hours of teaching program are given in all the fields of PRM (neurology, orthopaedics, podiatry, cardiology, pneumology, ...). The final graduation occurs at the end of the four years period of residency. The future medical doctor im PRM must present a thesis to obtain the medical doctor diploma. After the graduation many orientations and opportunities are possible. Most of the new medical doctors will work in rehabilitation center or private office. Some of them will decide to work in a public university hospital to focus on teaching, research and care.

The effects of rehabilitation treatment in improving the quality of life of patients with neurological manifestations of hiv infection

A. Jovanovic¹, M. Grajic¹, M. Manojlovic Opacic¹, J. Potic², V. Vesovic Potic¹

¹Clinic for physical medicine and rehabilitation, Clinical Center of Serbia, Belgrade, Serbia

²Clinical Center of Serbia, Belgrade, Serbia

Introduction. Neurological manifestations of HIV infection include CNS infections and tumors,vascular complications,peripheral neuropathies,myopathies.These days,the best treatment results are reached with "highly active antiretroviral therapy"(HAART),which increases the survival period.Physical medicine and rehabilitation procedures have an important role in improvement of quality of life of these patients.The aim of the study was to show the importance and necessity of rehabilitation treatment in patients with neurological manifestations of HIV infection in different stages of the diseases. **Materials and methods.** Study included 35 HIV-positive patients (26 males and 9 females, age 37±7) treated on the Institute for infective and tropical diseases in Belgrade (January 2007-December 2009). Neurological manifestations of these patients caused functional disorders (10 hemiparesis,2 spastic quadriparesis,8 paraparesis of low limb,3 paraplegia of low limb,6 ataxia,6 disorders in superficial and deep

sensibility). Rehabilitation program made the doctor for each patient individually according to functional neurological failure and general health status. Controls were made each day. Rehabilitation treatment included specific kinesy procedures, daily life activities training and was applied two times per day, six days in week during 30 days. Barthel Index and Karnofsky Performance Scale measured the result on admission and on discharge. **Results.** At discharge Barthel Index outcome was for all patients, except for 2 patients who died, between 65 and 95 and measured by Karnofsky Performance Scale between 50 and 60%. **Conclusion.** The results point out the importance of rehabilitation treatment in improving the quality of life of patients with neurological manifestations of HIV infection.

References

1. Cunningham WE, Shapiro MF, Hays RD, Dixon WJ, Visscher BR, George WL, Etl MK, Beck CK. Constitutional symptoms and health-related quality of life in patients with symptomatic HIV disease. *Am J Med.* 1998;104:129-36.
2. Scott WB, Oursler KK, Katzel LI, Ryan AS, Russ DW. Central activation, muscle performance, and physical function in men infected with human immunodeficiency virus. *Muscle Nerve.* 2007;36:374-83
3. Aires EM, Bammann RH. Pain in hospitalized HIV-positive patients: clinical and therapeutical issues. *Braz J Infect Dis.* 2005;9:201-8. Epub 2005 Oct 3.

Clinical-thermographic analysis in ankle sprains.

S. González Burgos, L. Platas Gabriel, L. García Delgado, C. Hernández de la Peña

Clinico San Carlos Hospital, Madrid (Spain)

Introduction. Ankle sprain is a common injury at the Emergency departments. The aim of this analysis is to know if thermography is a useful method to evaluate ankle evolution. To do this we describe thermographic asymmetries in a sprained ankle and its contralateral with a 1-week and 3-week follow-up. **Materials and methods.** We performed a descriptive study of a case series of 15 patients who attended the Traumatology Emergency department of the Clinico San Carlos Hospital. These patients were aged between 18 and 65 and all of them had suffered an ankle sprain in the previous 48 hours. The study variables were obtained through questionnaires, anamnesis, physical examination (including circometry) and realization of two thermographic projections. The instrument used to obtain thermal images was Thermographic SYSTEM VarioCAM hr (head HiRes 384). **Results.** 1. Normalization of circometric measures at the third week. 2. There is a correlation between circometry and temperature, with a tendency to linearity. 3. No statistically significant differences were found between the temperatures of the sprained ankle versus the uninjured ankle, in the first two periods of evolution. However, statistically significant results were found in the third week follow-up. 4. All of the thermographically studied ankles show a similar hyperthermic pattern. 5. There is a statistically significant correlation between the analysis of temperature and the circometry in the acute period. **Conclusion.** Thermography can be considered as a useful tool in assessing the evolution of ankle sprains, being a non-invasive (no radiation causes the patient), and fast, low cost method applied to locomotor diseases.

References

González Rebollo AM, Anton Andrew MJ, Fuertes González S et al. Implication of the thermography in the diagnosis of the reflex sympathetic dystrophy: with regard to a clinic case. *Locomotor Pathology,* 2007;5:68-74.

Effects of different upper limb robot-aided approaches in chronic hemiparetic patients

S. Mazzoleni¹, R. Crecchi², M.C. Carrozza¹, F. Posteraro²

¹Scuola Superiore Sant'Anna, Pisa, Italy

²Neurological Rehabilitation Unit, Auxilium Vitae Rehabilitation Center, Volterra, Italy

Introduction. Motor learning mechanisms are operative during the spontaneous stroke recovery and interact with rehabilitative training [1]. During the training, repetitive and novel tasks can be effective in reducing motor impairment after stroke [2]. Different robotic systems for rehabilitation of the upper extremities in neurologically impaired subjects were recently developed [3]. Recent systematic reviews showed that upper limb robot-aided rehabilitation treatments in post-stroke subjects improve short- and long-term motor control [4]. **Materials and methods.** Thirty-four chronic hemiparetic subjects were included in the study, having suffered the acute event at least a year prior to the experiment. Subjects were randomly assigned to Group A ("clock-like" robotic training) or Group B ("fan-

like" robotic training). The InMotion2 robotic system (Interactive Motion Technologies, Inc., Boston, MA, USA) was used [5]. In each session subjects received 45 minutes of robotic training, 3 sessions per week for 6 weeks. The following outcome measures were used: 1) Stage of Arm section of the Chedoke-McMaster Stroke Assessment Scale, 2) Motor Status Scale, 3) Passive range of motion, 4) Modified Ashworth Scale and 5) elbow active extension. A 3 months follow-up was also carried out. **Results.** After the robot-aided training results show a statistically significant decrease of motor impairment in paretic upper limb in both groups. **Conclusion.** The outcomes from both groups confirm the effectiveness of robot-aided rehabilitation treatments for chronic hemiparetic patients and support the hypothesis that the improvements of motor abilities can continue even more than one year after the acute event.

References

1. Krakauer J.W. *Curr Opin Neurol,* 2006, 19(1):84-90.
2. Barreca S. et al., *Neurorehab Neural Repair,* 2003, 17:220-226
3. Rieni R. et al., *Med Biol Eng Comput,* 2005, 43:2-10.
4. Kwakkel G. et al., *Neurorehab Neural Repair,* 2008, 22(2):111-121.
5. Krebs H.I. et al., *IEEE Trans Rehabil Eng,* 1998, 6(1):75-87.

Current evidence for the effectiveness of interventions to treat the subacromial impingement syndrome. Part III: Electro Shock-Wave Therapy B

MA Huisstede, L. Gebremariam, R. van der Sande, E. M Hay, B. W Koes

????

Introduction. The subacromial impingement syndrome (SIS) is a frequently reported specific diagnosis of the shoulder. Extracorporeal shock-wave therapy (ESWT) is applied in the treatment of tendinopathies. We assessed the level of evidence for the effectiveness of ESWT to treat calcific and non-calcific rotator cuff tendinitis. **Materials and methods.** The Cochrane Library, PubMed, Embase, Pedro, and Cinahl were searched for relevant systematic reviews and RCTs. Two reviewers independently selected relevant studies, assessed the methodological quality and extracted data. A best-evidence-syntheses was used to summarize the results. **Results.** We included 16 RCTs (11 and 5 trials on calcific and non-calcific rotator cuff tendinitis, respectively). For calcific rotator cuff tendinitis, strong evidence was found for effectiveness in favour of high ESWT versus low ESWT in short-term. Moderate evidence was found in favour of high ESWT versus placebo in short-, mid- and long-term, and versus low ESWT in the mid- and long-term. Moreover, high ESWT was more effective (moderate evidence) with focus on calcific deposit versus focus on tuberculum major in the short- and long-term. RSWT was more effective (moderate evidence) than placebo in the mid-term. For non-calcific rotator cuff tendinitis, only limited evidence was found in favour of medium ESWT plus kinesitherapy versus kinesitherapy alone or versus controls in the short-term. No evidence in favour of low, mid or high ESWT versus placebo, each other, or other treatments was found. **Conclusion.** This review shows that only high ESWT is effective for treating calcific rotator cuff tendinitis. No evidence was found for the effectiveness of ESWT for treating non-calcific rotator cuff tendinitis.

References

Bionka MA Huisstede, Lukas Gebremariam, Renske van der Sande, Elaine M Hay, Bart W Koes. Current evidence for the effectiveness of interventions to treat the subacromial impingement syndrome. Part III: Electro Shock-Wave Therapy. Submitted.

Effectiveness of interventions of specific complaints of the arm, neck and/or shoulder (CANS): Three musculo-skeletal disorders of the hand. An update

B. M. Huisstede, M. van Middelkoop, M. S. Randsdorp, S. Glerum, B. W. Koes

????

Introduction. To provide an evidence-based overview of the effectiveness of conservative and surgical interventions for trigger finger, Dupuytren's, and De Quervain's disease. **Materials and methods.** The Cochrane Library, PubMed, Embase and Cinahl were searched to identify relevant studies. Two reviewers independently applied the inclusion criteria to select potential relevant studies from the title and abstracts of the references retrieved by the literature search. Relevant (Cochrane) reviews and randomized controlled

trials (RCTs) were included. Two reviewers independently extracted the data and performed a methodological quality assessment. A best-evidence-syntheses was performed to summarize the results of the included trials. **Results.** One Cochrane review (trigger finger) and 13 RCTs (trigger finger=6, Dupuytren's=4, De Quervain's=3) were included. The trials reported on physiotherapy (De Quervain's), steroid injections (trigger finger, De Quervain's), surgical treatment (trigger finger, De Quervain's) and a postsurgical treatment (Dupuytren's). For trigger finger moderate evidence was found for the effectiveness of steroid injections on the short term (1-4 weeks), but not for long-term outcomes. Limited evidence was found for the effectiveness of staples compared to sutures in skin closure, and for intermittent compression after surgery to treat Dupuytren's disease. For other interventions no evidence was found. **Conclusions.** Indications for effectiveness of some interventions for trigger finger, Dupuytren's and De Quervain's disease were found. Because only a few RCTs were identified it is difficult to draw firm conclusions. High-quality RCTs are clearly needed in this field.

References

Huisstede BMA, van Middelkoop M, Randsdorp MS, Glerum S, Koes BW. Effectiveness of interventions of specific complaints of the arm, neck and/or shoulder (CANS): Three musculoskeletal disorders of the hand. An update. Arch Phys Med Rehab. 2010 Feb;91(2):298-314.

Endurance and surface electromyography power frequency analysis of paraspinal muscles in patients with chronic low back pain undergoing exercise program

Sedat Yildiz¹, Feray Soyupek¹, Suleyman Bilgin², Hasan Rifat Koyuncuoglu³

¹Suleyman Demirel University, Medical School, Department of Physical Medicine and Rehabilitation, Isparta, Turkey

²Akdeniz University, Faculty of Electrical and Electronics Engineering, Antalya, Turkey

³Suleyman Demirel University, Medical School, Department of Neurology, Isparta, Turkey

Introduction. The aim of this study is to evaluate the effects of exercise program on endurance, pain, disability and surface electromyography(SEMG) power frequency analysis(FA) of paraspinal muscles in the patients with chronic low back pain(CLBP). **Materials and methods.** This study is a short-term(6 weeks) longitudinal cohort study. Forty male subjects with CLBP, grouped as Group1=exercise+education and Group2=only education. Exercise program involved lumbar extension and lumbar stabilization exercises supported with guides, educational videos and 2 sessions of supervised exercise therapy. The raw SEMG signals were recorded from T10 and L5 paraspinal levels with PowerLab8/30 EMG system in order to evaluate median frequency(MF), slope of the linear regression of MF(Mfgrad) and initial MF(IMF). Main outcome measures were endurance time in Sorensen test(ST), self-rated disability with Roland Morris Disability Questionnaire(RMD), pain intensity with VAS(0-10), IMF and Mfgrad. The datas are analyzed on the LabChart Pro®, Matlab 2008® and SPSS 15.0. **Results.** There were no significant differences in RMD, ST and FA from baseline to post treatment values in Group 2, but the reduction in VAS scores were significant(p=<0,05). In Group 1, we found improvements in RMD, VAS score and ST after exercise program(p=<0,05). In FA, only IMF obtained from L5 level showed significant change from pre-to post treatment(p<0,05). There were significant correlation between IMF and ST in Group 1(r=0,774 p=0.000). **Conclusion.** Six week exercise therapy had an effect on disability, pain and endurance time. Only IMF displayed a significant relationship with endurance time for the task. This may reflect a lack of sensitivity of Mfgrad as the method for evaluating muscle endurance.

Effect of lesion site on the reinforcement learning in virtual reality: a study on post-stroke patient

A. Turolla¹, A. Boscolo², M. Agostini¹, P. Kiper¹, A. Vendramin¹, L. Piron¹

¹Department of Neurorehabilitation, I.R.C.C.S. San Camillo Hospital, Lido di Venezia, Italy.

²Villa Salus Hospital, Mestre-Venezia, Italy

Introduction. Conflicting results emerged about the correlation between the site of brain lesion and the motor and functional outcomes after an ischemic stroke, the aim of this study was to evaluate if the lesion site could induce different motor and functional outcomes

in this population. **Materials and methods.** A retrospective analysis on patients treated between the 2003 and 2008 was conducted. Two groups (24 patients in the study group treated with Virtual Reality, VR, and 17 patients in the control group treated with conventional physiotherapy, CTRL), further stratified in subgroups both due to the site lesion (cortical, subcortical, miscellaneous) and the cortical area involved (primary motor, primary motor and sensory), were analysed. Both treatments lasted 4 weeks. Before and after the treatments the patients were assessed both clinically (FIM, Fugl-Meyer, F-M UE, Nine Hole Pegboard) and kinematically (time, velocity, smoothness) performing reaching movements. **Results.** In the per-lesion analysis the patients in the VR group significantly improved within all the subgroups in the F-M, F-M UE scales and velocity, while no differences emerged in the control group. In the comparison between groups, statistically significant difference was found in VR cortical subgroup at F-M scale. In the per-cortical area analysis the average improvement of the primary motor VR group was equal or major to 12% compared with the control group for all clinical scales except the FIM. **Conclusion.** Patients treated with RV seem to obtain a significant improvement in motor performance compared to patients treated with conventional therapy, especially the cortical subgroup.

References

1. Chen C-L, et al., (2000), "Brain Lesion Size and Location: Effects on Motor Recovery and Functional Outcome in Stroke Patients", Arch. Physical Medicine and Rehabilitation, Vol. 81, pag. 447-52
2. Kunesch E, et al. (1995), "The pattern of motor deficits in relation to the site of stroke lesions.", European Neurology, Vol. 35(1), pag.:20-6.
3. Sveistrup H., (2004), "Motor rehabilitation using virtual reality", Journal of NeuroEngineering and Rehabilitation, pag. 1:10

Changes in locomotory functioning after a combined training with GaitTrainer and dynamic orthosis in patients affected by cerebral palsy (PCD): a pilot study

A. Cosentino¹, B. Montagnana¹, P. Bonetti², A. Vangelista¹, M. Recalcati¹, F. Pinto¹, M. Bendinelli¹, N.Smania^{2,3}, A. Fiaschi^{2,4}

¹Unità Operativa di Valutazione Innovazione e Ricerca, Centro Polifunzionale Don Calabria, Verona, Italia

²Scuola di specializzazione in Medicina Fisica e Riabilitativa, Dipartimento di Scienze Neurologiche e della visione, Università degli Studi di Verona, Italia

³Università degli Studi di Verona, Dipartimento di Scienze Neurologiche e della Visione, Centro di Ricerca in Riabilitazione Neuromotoria e Cognitiva, Italia

⁴Scuola di specializzazione in Neurologia, Dipartimento di Scienze Neurologiche e della visione, Università degli Studi di Verona, Italia

Introduction. Children affected by cerebral palsy (CP) have a reduced gait performance that leads to low levels of social relationships and life quality¹. An innovative dynamic orthosis, Theratogs² and a new robotic devices, Gait Trainer (GT)³ have been purposed for gait rehabilitation in CP affected children. This study aims at analysing the modifications in term of clinical and instrumental gait parameters in CP affected patients induced by three different rehabilitation training conducted by 1.GT, training 2.ThT, 3.combined GT+TH. **Materials and methods.** Twelve children with spastic CP have been enrolled with lower or all limbs impairment(dyparesis, tetraparesis); (6 males, 6 females; age range 5y 0mo-17y 10mo; Gross Motor Function Classification System levels I-III). Children have been divided into 3 different training groups, each one composed by 4 patients (half with GMFM I-II and III-IV). The treatments have been: 1.GT, 2.ThT, 3.combined GT+ThT. Clinical (Wee-FIM scale and interview to parents and children) and instrumental (Gait Analysis) gait parameters have been evaluated before and after training. **Results.** GT group improve in WeeFim scale, gait speed and hip exstension. ThT group improve gait speed and pelvic tilt. The GT+TH training lead to the better improvement in all the clinical and instrumental gait parameters analyzed. **Conclusion.** GT combined with ThT training improved gait performance in CP affected children. More studies are necessary to confirm these preliminary data.

References

1. Quantification of energy expenditure during gait in children affected by cerebral palsy. Piccinini L, Cimolin V, Galli M, et al. Eur J Med Res. 2007 Mar;43(1):7-12. Epub 2006 Oct
2. Evaluation of short-term intensive orthotic garment use in children who have cerebral palsy. Flanagan A, Krzak J, Peer M, et al. Pediatr Phys Ther. 2009 Summer;21(2):201-4.
3. Gait rehabilitation machines based on programmable footplates. Schmidt H, Werner C, Bernhardt R et al. J Neuroeng Rehabil. 2007 Feb 9;4:2.

Cognitive impairment in hip fractured patients

F. Gimigliano, G. Iolascon, G. Del Gaudio, V. Pipolo, S. Tartaglia, R. Gimigliano

Dpt. of Orthopedics and Rehabilitation Medicine, Second University of Naples

Introduction. Cognitive impairments are strongly related to a higher rate of falls and hip fractures. It's well-known that cognitive impairment might be responsible of the fall and eventually of the fragility fracture but this condition might also be a consequence of the trauma or surgery. The aim of our study was to evaluate the cognitive impairment of patients who had a hip fracture. **Materials and methods.** We conducted a National Survey involving 100 units of Orthopedics, Traumatology and Rehabilitation. Each unit was asked to enroll both patients who had a hip fracture and patients who went to the outpatient for a different problem. Data on their cognitive status were collected using the Short Portable Mental Status Questionnaire (SPMSQ).¹ Data on 3,719 patients were collected, we excluded 452 patients because younger than 65 (which was an inclusion criteria) and other 12 patients were excluded because data on SPMSQ were missing. Therefore the complete analysis was done on 3,255 patients. **Results.** The mean age of the 3,255 patients was 76,93 y.o. (min 65; max 100), 591 were male and 2,664 were female. 1,541 (47.34%) had a hip fracture. The 34.39% of patients with a hip fracture had a score at the SPMSQ higher than 5, that is a moderate to severe cognitive impairment versus the 10.28% of the group of subjects without a hip fracture. This difference remains significant also adjusting the 2 groups for age and sex. **Conclusion.** Cognitive impairment is a relevant problem in patients who sustained a hip fracture, it's always necessary to investigate it in order to elaborate a good rehabilitative program.

References

1. Pfeiffer E. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *J Am Geriatr Soc.* 1975 Oct;23(10):433-41.

Lower limb lymphedema and Health Related Quality of Life in patients with melanoma metastatic to inguinal lymph nodes: a perspective cohort study

M. Pinto¹, F. Gimigliano², C. Caracò¹, G. Iolascon², G. Di Pietro¹, U. Marone¹, F. Iazzetta¹, S. Piscopo¹, R. Gimigliano²

¹National Cancer Institute of Naples "G. Pascale Foundation", Naples
²Second University of Naples

Introduction. Lower limb lymphedema can occur in melanoma patients who undergo inguinal lymphadenectomy. The aim of our study was to evaluate the incidence of lymphedema and its association with ambulation categories and perceived Health Related Quality of Life (HRQoL). **Materials and methods.** During 2008, 19 patients with melanoma underwent unilateral inguinal lymphadenectomy at the Cancer National Institute of Naples. All patients were evaluated for the detection of leg swelling by comparative circumferential measurements preoperatively and at 3 months intervals after surgery for at least one year follow-up. 12 developed a lymphedema of the lower limb. 2 of them were excluded because had a stroke event. For the remaining 10 patients we collected data about lymphedema stage, which was assessed according to the International Society of Lymphology Classification¹; the time from surgery to lymphedema (in months), ipsilateral sensibility impairments, Functional Ambulation Category (FAC), perceived HRQoL (by SF-12); sex, age and BMI. **Results.** Lymphedema incidence in our cohort was 63.16%. The 10 patients enrolled (4 men and 6 women; mean age 59.1, min 29, max 82) had a median onset time of lymphedema of 3 months (min 2, max 13). The mean BMI was 29.39. 6 patients presented a stage I lymphedema whereas 4 stage II. Mean SF-12 PCS was 37.39 (±3.47) and mean MCS was 45.38 (±12.03). 5 of these patients presented an ipsilateral sensibility impairment, and only one patient had a minimal limitation in walking autonomy (FAC=4). **Conclusion.** The possibility to develop lymphedema has to be always considered in patients who undergo inguinal lymphadenectomy. Therefore its intensive surveillance program should be a pivotal point of their post-operative treatment, in order to detect and treat it as soon as possible.

References

1. The Diagnosis and Treatment of Peripheral Lymphedema. 2009 Consensus Document of the International Society of Lymphology. *Lymphology* 42 (2009) 51-60.

Functional limitation of the shoulder and Quality of Life in cancer patients following neck dissection surgery

M. Pinto¹, F. Gimigliano², F. Ionna¹, G. Iolascon², C. Aversa¹, P. De Blasis², M. Scognamiglio¹, R. Gimigliano²

¹National Cancer Institute of Naples "G. Pascale Foundation", Naples
²Second University of Naples

Introduction. Despite a more conservative surgical approach, shoulder impairments often occur after neck dissection surgery. The aim of our study was to evaluate the perceived Health Related Quality of Life (HRQoL) in a cohort of cancer patients who underwent this kind of surgery. **Materials and methods.** We recruited 27 patients approached at the first rehabilitative outpatient follow-up (about 1 month after surgery) at the National Cancer Institute of Naples. Two patients refused to sign the informed consent and 5 patients were excluded because of severe comorbidities. At the end 20 patients were included into the study. We measured shoulder active ROM and sensibility impairments. Patients who were not able to comb their hair were considered to have a functional limitation of the upper limb. The perceived HRQoL was evaluated by SF12. **Results.** The 20 patients (14 men and 6 women) had a mean age of 57.7 (min 34, max 88), the mean BMI was 26.64. The 65% of patients had shoulder abduction less than 110°, the 20% of patients had a significant limitation in shoulder intrarotation, and the 35% of patients had a relevant limitation in the flexion and extrarotation of the shoulder. The 85% of patients complains of a sensibility impairment. The 40% of patients was not able to carry out the combing task. Mean PCS score was 40.46 and mean MCS score was 49.94. **Conclusion.** Despite the fact that patients who undergo neck dissection surgery have a significant limitation of the shoulder mobility and functioning their quality of life is acceptable.

References

1. Nibu K, Ebihara Y, Ebihara M, et al. Quality of life after neck dissection: a multicenter longitudinal study by the Japanese Clinical Study Group on Standardization of Treatment for Lymph Node Metastasis of Head and Neck Cancer. *Int J Clin Oncol.* 2010 Feb;15(1):33-8.

Validity of FRAX in orthopedic and rehabilitative settings: an Italian people-based survey

G. Iolascon, F. Gimigliano, M. Gioia, R. Napolano, A. Tirelli, R. Gimigliano

Dpt. of Orthopedics and Rehabilitation- Second University of Naples

Introduction. Hip fracture represents the most severe complication of osteoporosis. It is related to a high impact of mortality and morbidity of aged people. A robust understanding of osteoporosis risk factors beyond low bone mineral density has led to the development of the WHO 10-yr probability of major osteoporotic fracture model (FRAX) tool¹. Using information about some risk factors for osteoporosis, it's possible to have a 10-year probability of developing an osteoporotic fracture. We conducted an epidemiological survey on hip fractured patients in order to evaluate the validity of the FRAX for prediction of hip fracture. **Materials and methods.** Participants in INDACO2 study were women and men aged 65 yr or older recruited in 100 departments of orthopedics and traumatology and distributed along Italy. Of a total of 3,003 subjects, 1,384 had hip fracture and 619 had no fragility fractures. **Results.** The two groups was comparable for age and sex. Hip fractured patients presented a mean FRAX score of 17.19 (0.9-67), whereas subjects without fragility fractures presented a mean FRAX score of 17.77 (0.6-75). **Conclusion.** Our data doesn't support the hypothesis that FRAX is a tool identifying subjects at higher risk of hip fracture better than age and BMD.

References

1. Kanis JA, Oden A, Johansson H, Borgström F, Ström O, McCloskey E. FRAX and its applications to clinical practice. *Bone.* 2009;44(5):734-43.

Efficacy of manipulation-mobilization therapy on pain, function and quality of life in patients with adhesive capsulitis

O. Seyyah, B. Erhan, B. Gunduz, M. Yelkovan, A. Bardak, F. Savas, H.B. Secl

Istanbul Physical Medicine And Rehabilitation Hospital/ Istanbul

Objective. Patients with adhesive capsulitis are associated with increased pain, decreased range of motion(ROM), function and qua-

lity of life. The aim of our study was to investigate the effect of manipulation-mobilization treatment on ROM, pain, function and quality of life in patients with adhesive capsulitis. **Materials and methods.** In this prospective randomized controlled single blind study, 60 patients (34 women, 26 men) who were diagnosed as adhesive capsulitis between March 2008- June 2009 were enrolled. The patients were randomly divided into two groups: 30 patients were included in the manual therapy group and were treated with manipulation-mobilization once a week during 2 weeks; the other group was the control group. Both groups were instructed to do home exercises for 3 months and they were prescribed non-steroid antiinflammatory drugs. The shoulder pain with motion, at rest and night were evaluated with visual analogue scale (VAS) at two weeks and at three months; at the same time active ROM and Constant score were used to evaluate function. Quality of life was evaluated with Short-Form 36 evaluated at baseline and at three months. Descriptive statistics, chi-square and independent t tests were used as statistical methods. **Results.** Mean age of the groups was 54.0±9.5 years, median duration of adhesive capsulitis was 150 days (20-360 days range). There were no statistically significant differences between the groups according to age, gender and duration of adhesive capsulitis ($p>0.05$). Significant increases in active ROM, Constant scores, and SF-36 scores were detected. There was a significant decrease in VAS scores in both groups ($p<0.05$); but in the manual therapy group the improvement was better in ROM, VAS scores associated with motion, Constant scores and SF-36 scores ($p<0.05$). **Conclusion.** Our results show that manipulation-mobilization and exercise treatments are both effective in adhesive capsulitis; manipulation-mobilization was superior improvement of in ROM, pain, and quality of life.

References

1. Vermeulen HM, Rozing PM, Obermann WR. Comparison of High-Grade and Low-Grade Mobilization Techniques in the Management of Adhesive Capsulitis of the Shoulder: Randomized Controlled Trial. *Physical Therapy*. Volume 86. Number 3. March 2006.
2. Schneider W, Dvorak J, Dvorak V, Tritschler T. Manual therapy: Concepts and Mechanism of Action. In: Gilliar WG, Greenman PE, editors. *Manual medicine therapy*. 1st ed. New York: Thieme Medical Publishers; 1988:1-17.

Intra-articular distension and steroids in the management of hemiplegic shoulder: A randomized controlled Trial

A. Doğan, R. Demirta, N. Özgirgin
Ankara Physical Therapy and Rehabilitation Education and Research Hospital Ankara TURKEY

Introduction. The comparison of conventional physical therapy and rehabilitation applications with intraarticular steroid administration and the hydraulic distention of the glenohumeral joint together with steroids in patients who had developed shoulder pain and joint movement restriction following a stroke. **Materials and methods.** A total of 60 patients who had shoulder pain and limitation and had been included in a rehabilitation program as an inpatient following a stroke were included in the study. The patients were divided into 3 groups of 20 patients each according to their order of admission. The joint was evaluated using the joint range of motion (JRM), pain and functional status before the patients were included in the treatment and one day and one month later. **Results.** There was a significant increase in ROM (goniometry), pain (VAS) and functional status (FIM) values in all groups at one month ($p<0.05$) but the improvement in the steroid + distention group was statistically significantly better than the other groups ($p<0.001$). **Conclusion.** The marked increase in ROM in all directions at the 1-month evaluations and the decreased pain together with better upper extremity functions indicate that steroids + distension of the shoulder joint can be used in preference to other treatments as an inexpensive, easy and effective method in stroke patients with shoulder pain and ROM limitation.

References

1. Chae J, Jedlicka L. Subacromial corticosteroid injection for poststroke shoulder pain: An Exploratory prospective case series. *Arch phys Med Rehabil* 2009; 90:501-6
2. Ingrid A.K. Snels, Beckerman H., Twisk W.R, Dekker H.M, Koning P, Koppe P.A, Lankhorst G.J, Bouter L.M Effect of triamcinolone acetonid injections on hemiplegic shoulder pain :A randomized clinical Trial. *Stroke*. 2000;31:2396-2401.

Ankle arthroplasty in haemophilic arthropathy. A care network for rehabilitation

P. Martinez, S. Franz, R. Tramontozzi, M. De Pedis, A. Selvanetti, A. Antonaci
Azienda Ospedaliera S. Giovanni-Addolorata Roma. UOC Medicina Fisica e Riabilitazione. Centro di Riabilitazione "Medical Corner"

The authors report their experience in the rehabilitation treatment of patients with haemophilic arthropathy. Our structure is, infact, the rehabilitation reference Center in Lazio Region. So we touch on patients with complications due to underlying disease, also often treated surgically. We cooperates with other centers of reference, each in its domain, creating a care network that touch on haemophilic patients. In this study we want report difficulties and strenghts of this network, taking into account the case of a patient with total ankle replacement.

References

1. Beeton K, Rodriguez-Merchan EC, Alltree J. "Total joint arthroplasty in haemophilia", *Haemophilia*, 2000 Sep;6(5):474-81.
2. Bossard D, Carrillon Y, Stieltjes N, Larbre JP, Laurian Y, Molina V, Dirat G. "Management of haemophilic arthropathy", *Haemophilia*, 2008 Jul;14 Suppl 4:11-9.
3. Rodriguez-Merchan EC. "Total joint arthroplasty: the final solution for knee and hip when synovitis could not be controlled", *Haemophilia*, 2007 Nov;13 Suppl 3:49-58.
4. Ballal RD, Botteman MF, Foley I, Stephens JM, Wilke CT, Joshi AV. "Economic evaluation of major knee surgery with recombinant activated factor VII in hemophilia patients with high inhibitors and advanced knee arthropathy; exploratory results via literature-based modelling", *Curr Med Res Opin*, 2008 Mar;24(3):753-68

Establishment of multidisciplinary pain clinic in physical medicine & rehabilitation department (report of an experience and review of cases)

Seyed Mansoor Rayegani¹, Noor Mohammad Aarefian², Amir Hosain Sedighi³, Mohammad Hasan Bahrami⁴, Dariush Elyaspoor⁵, Bijan Tarraaghi³, leyla Sedighipoor⁷,

- ¹Professor of physical medicine and rehabilitation,
 - ²Assistant professor of anesthesiology,
 - ³Assistant professor of neurosurgery,
 - ⁴Associate Professor of physical medicine and rehabilitation,
 - ⁵Assistant Professor of physical medicine and rehabilitation
 - ⁶Assistant Professor of psychiatry,
 - ⁷Resident of Physical medicine and rehabilitation
- Sbhadra medical center, Shabid Medical University, Tebran, Iran*

Introduction. Multidisciplinary pain approach is by far the most common and effective approach to pain management. Core disciplines that are involved are anesthesiology, psychiatry, psychology, physical medicine and rehabilitation. Multidisciplinary pain clinics were set up in our medical centers, in Shohada medical center the clinic was set up in our PMR ward. Herein we report 51 interested referred cases from Jan. 2009 to Jun. 2009. They were referred mostly by neurosurgeons, physiatrists, orthopedic surgeons, and general practitioners. **Materials and methods.** Patients demographic data were as follows: females: 25 patients, males: 26 patients. Mean age of patients was 48 years old (ranging from 9 to 85 years old). Male to female ration was nearly equal (male: 26 and female: 25). Mean duration of pain was 3 years. Opium addiction due to disabling chronic pain was detected in 7 Patients. Geographic localization of pain were as follows: Low back; 20 patients, neck; 5 cases lower limbs; 5 cases, shoulder; 1 case, mastectomy site; 2 cases, thoracotomy site; 1 case, coccygeal are; 2 cases, pelvic area; 2 cases, post SCI; 7 cases, head; 2 cases, hand; 4 cases. All referred cases were evaluated by taking complete and pertinent medical History and P/E by a physiatrist and full past medical history, lab data, imaging and previous treatment done were detected and recorded, Pain intensity and frequency and its functional impacts on patients life was assessed by filling out SF-36 questionnaire and VAS. Psychiatry consultation was performed for all patients. The cases finally were presented to multidisciplinary team for final diagnostic and/or therapeutic decisions. **Results.** Following diagnoses were finally detected; failed back syndrome, poorly and incomplete treated lumbosacral and cervical discopathy, myofascial pain syndrome, central SCI pain syndrome, herpetic neuralgia, lumbar plexus neuroma, fibromyalgia and psychosomatic disorders. Treatment options included medication, surgical intervention, interventional pain management such as; epidural block, PRT, facet joint and medial branch injection, trigger points injection, manipulation. For all patients proper physical therapy measures including electrotherapy, thermotherapy, Laser and soft tissue mobilization

were applied. Psychiatric and/or psychologic measures mainly cognitive behavioral therapy were given accordingly. In some resistant cases rapid Transcranial Magnetic Stimulation was used. **Conclusion.** Overall results of managements are favorable and patients are following up in regular periods for final outcome. Physiatric evaluation and management that emphasizes on functional evaluation in addition to complete medical history and pertinent neuromusculoskeletal examination and holistic vision in treatment options has had a crucial role in justification of the patients management.

Effectiveness of rehabilitation programe following hip arthroplasty

D. Matei, R. Traistaru, R. Popescu, A. Bighea, D. Dragoi
University of Medicine and Pharmacy Craiova, Romania

Introduction. Physiotherapy has long been a routine component of patient rehabilitation following hip joint replacement. (1) The aim of this study was to determine whether the rehabilitation programe (physiotherapy exercise and massage) is useful for patients with hip replacement. **Materials and methods.** A number of patients with recent hip arthroplasty for osteoarthritis (n:41) were included in this study. Demographic data, the level of pain, hip osteoarthritis duration (years), body mass index and previos rehabilitation programe were noted. We compared physiotherapy exercises group of patients (n:21) versus usual/standard care group (n: 20) looking for the hip range of motion (ROM) and muscle strength, walking and quality of life. **Results.** Compared to the usual care group, the patients with early kinetotherapy programe showed a better correlation between the clinical and functional variables, with a superior predictability where the ROM and muscle strength are concerned, in connection to pain (R=0,638 and R²=0,445); moreover, the early rehabilitation patients group showed a significant correlation with a 50% predictability for improving the quality of life assessed by SF-36. **Conclusion.** Early hysiotherapy programe (kinetotherapy and massage) following total hip replacement has the potential to benefit patients.

References

1. Minns Lowe CJ, Barker KL, Dewey ME, Sackley CM, Effectiveness of physiotherapy exercise following hip arthroplasty for osteoarthritis: a systematic review of clinical trials, BMC Musculoskelet Disord. 2009 Aug 4;10:98.

Predictive factors of disease activity evolution in rheumatoid arthritis patients

D. Matei, R. Traistaru, R. Popescu, A. Bighea, D. Dragoi, A.M. Bumbea
University of Medicine and Pharmacy Craiova, Romania

Introduction. Rheumatoid arthritis is a systemic chronic arthropathy, defined as autoimmune disease, characterized by an inflammatory process that develops irreversible joint damage.(1) The present study, aimed to improve overall quality of life for patients with rheumatoid arthritis, is motivated by the importance that health and social problem of this disease. Quality of life in relation to health is a multi-dimensional valence, the net result of disease and treatment on patient perception, the ability to have a full and useful life. **Materials and methods.** We conducted a controlled trial study type, longitudinal, randomized a total of 90 patients with rheumatoid arthritis, the patients were monitored by a single research protocol and evaluated complex. We followed clinical evaluation of patients, assessing the response to treatment using ACR criteria and identify the patient characteristics that best meet remission form of therapy. **Results.** The results confirmed the role of monitoring biological parameter C-reactive protein as a marker of disease activity accurately. Antibodies anti-CCP as immunological markers of severity and prediction of structural destructive development were significantly correlated with disease duration and the standard parameters of inflammation. The parameters resulted in the construction of therapeutic response profiles. Thus, patient profile with the maximal response is characterized by a male patient, who is fourth decade of life, non-smoking, duration of illness less than 24 months, with an initial score of moderate or intense activity, low functional disability (corresponding to a class <3). **Conclusion.** Repercussions on the quality of life for patients with rheumatoid arthritis- lies in the inability of more than half of patients during the active life is not assigned to a socio-economic activity, the motivation being disability attributable disease.

References

1. Firestein GS, Evolving concepts of rheumatoid arthritis, Nature, 2003; 423:356-61.

Lack of vitamin D as cause of vertebral fractures – Case Report

S. Amorim; H. Lopes; A. Amado; L. Dias

Centro Hospitalar de Trás-os-Montes e Alto Douro, Unidade de Vila Real

Introduction. A lack of vitamin D is defined by serum 25 hydroxyvitamin D (25OHD) of less than 30 ng / ml or concentrations of 25OHD for which there are deleterious effects, particularly the presence of bone remodelling. The incidence of lack of Vitamin D estimated is: 15-30% in the general population, 59% in healthy people between 60-79 years and up to 98% of the elderly living in institutions and without supplemental vitamin D. **Case Report.** A 74 years old woman, bedridden for 15 days was referred to the Emergency Service for convulsions. No relevant brain lesions were detected in cerebral TC. During the investigation, it was detected severe hypocalcaemia with low magnesium and increased levels of parathyroid hormone. Started correction with parenteral calcium and magnesium with low results which led to think of concomitant lack of vitamin D, laboratory confirmed. Given the suspicion of vertebral lesions - continuous complaints of low back pain – was made a spinal MRI that showed D10 and D11 bodies collapse. Assumed osteoporotic fracture by lack of vitamin D, the patient started therapy with zolendrónic acid, stabilization column with jewett vest and rehabilitation program including: techniques of physiotherapy, muscle strengthening and verticalization, with a good recovery. The patient was transferred to rehabilitation center, being clinically stable, with less pain and already doing verticalization. **Conclusion.** With this event we want to focus the role of vitamin D in preventing fractures, and its co-responsibility in other deficits, particularly in the elderly, bedridden and / or institutionalized, whose lack of vitamin D may be confused with symptoms secondary to organic disorders.

References

- Holick MF. Vitamin D deficiency: what a pain it is. Mayo Clin Proc. Dec 2003;78(12):1457-9.
Thomas MK, Lloyd-Jones DM, Thadhani RI, et al. Hypovitaminosis D in medical inpatients. N Engl J Med. Mar 19 1998;338(12):777-83.

A study on Clinical grading of Osteoarthritis of the knee joint & its correlation with radiological grading

M. Habibur Rahman

Dept of Physical Medicine, Dhaka Medical College.

Background information. Osteoarthritis (OA) is a common musculoskeletal disorder particularly among middle aged population . Knee joint is more commonly affected joint than hip joint in Bangladesh. OA knee is the most common cause of disability. It is a chronic progressive disease & management depends on severity of the disease. There is a radiological grading of severity of the disease but no clinical grading. The aim of this study was to find out a clinical grading & to co-relate this with radiological grading. **Study design.** All patients who were diagnosed as OA knee both clinically & radiologically & who had no history of trauma or septic arthritis were included in this study. On the bases of clinical symptoms the patients were divided into four grades & each again subdivided into a & b. Co-relation between clinical grading & radiological grading were done. **Results.** A total 218 cases were studied. It is an ongoing study. Out of 218 cases, 52.63% were female. 63% patients were working in a low sitting position or squatting position. Only right knee involvement was 24%, left knee involvement was 21% & both knees were 55%. 35% pt were in clinical grading IIb & 21.6% was in grade IIa. That means 56.6% was in grade II. Radiologically 56% of our patients were in grade II. **Conclusion.** From this study we can say our clinical grading is correlated with the existing radiological grading.

Knee Osteoarthritis patients treated with intra-articular hyaluronic acid (Jointex): functional and postural outcomes

A. Magrini, T. Viliani, G. Mangone, E. Pratelli, P. Pasquetti

Recovery and Rehabilitation Agency, University Hospital of Careggi, Florence, Italy

Introduction. Knee osteoarthritis (KOA) is a common and progressive joint disease and nowadays don't exist effective disease-modifying interventions. Treatments used are mostly symptomatic

such as intra-articular injections of hyaluronic acid. Aim of this study is to determine effectiveness of sodium hyaluronate (Jointex) in reducing pain, stiffness and disability in KOA patients at short and long term and to evaluate its effects on lower limb biomechanics. **Materials and methods.** 29 patients were treated with five weekly injections of sodium hyaluronate 2mL (Jointex). Inclusion criteria: diagnosis of primitive and unilateral KOA (ACR criteria), II-III Kellgren scale, daily knee pain on movement of more than 3cm in a 10cm visual analogic scale (VAS). The outcomes included pain on movement and at rest, Western Ontario and McMaster Universities Osteoarthritis index (WOMAC) score, distribution of weight in standing position and during stance phase of gait measured with baropodometric examination. Follow-up was carried out six months after treatment. Data had been analyzed with T-student test for statistic significance. **Results.** Mean age was 69 years (range 50-82), 20 were female and 10 male. Our preliminary data show an improvement with statistical meaning in terms of pain on movement and reduction of disability in our patients after treatment. Biomechanical parameters resulted also improved. The improvement is maintained, and in some cases furtherly increased, at the follow-up after six months. During the congress will be shown complete and definitive data. **Conclusion.** Therapy with hyaluronic acid (Jointex) determines a reduction of pain and disability in moderate KOA (stadium II-III Kellgren) at short and long term. Results obtained with baropodometric exam suggest that reduction of pain can result in improvement of lower limb biomechanic parameters that, if altered, can contribute to arthritis progression.

References

Brzusek et al 2008 *Curr Med Res Opinion* 24(12):3307-3322.
Bellamy et al 2008 *The Cochrane Library*.

Outpatient home-based rehabilitation program after total knee arthroplasty

T.R. Fernández, M. Valdés, J. Molins, R. San Segundo, E. Calero, S. Ródenas

Xarxa Sanitària i social Santa Tecla. Tarragona. Spain.

Introduction. Uncertainty exists regarding whether physiotherapy after discharge should be routinely provided after primary total knee arthroplasty (TKA) (1,2). The aim of this study was to assess the effectiveness of an outpatient supervised rehabilitation program after TKA. **Materials and methods.** A non-randomized, experimental study was conducted in 219 patients (mean age 71,7) with osteoarthritis, undergoing primary TKA in two different hospitals from the same area. After discharge from the hospital, those patients with passive flexion more than 80° and less than 10° flexion contracture followed either a home based rehabilitation program with a physiotherapist (group 1, hospital 1; n=59) or continued exercises at home without supervision (group 2, hospital 2; n=53). The rest of patients in both hospitals followed a supervised home based rehabilitation program (n =107). Passive ROM, WOMAC questionnaire, the timed up and go test (TUG) and patient satisfaction (visual analogical scale: 0-10) were evaluated preoperatively, at 1-month, at 3-month and 6-month reviews after surgery. **Results.** Patients in group 1 performed slightly better than group 2 in WOMAC rigidity subscale (mean difference (95%CI)=0.7 (0.2,1.3)) and satisfaction (0.8 (0.2,1.4) at 6 month. There were no differences between groups for the rest of variables. Mean outpatient physiotherapy sessions attended in group 1 was 11,3 (SD 7,3). **Conclusion.** In our study a supervised home based rehabilitation program after TKA does not results in much better functional outcomes in selected patients (ROM better than 80°-10° at the time of discharge from hospital).

References

1. Minns Lowe CJ, Barker KL, Dewey M, Sackley CM. Effectiveness of physiotherapy exercise after knee arthroplasty for osteoarthritis: systematic review and meta-analysis of randomised controlled trials. *BMJ* 2007;335:812
2. Mockford BJ, Thompson NW, Humphreys P, Beverland DE. Does a Standard Outpatient Physiotherapy Regime Improve the Range of Knee Motion After Primary Total Knee Arthroplasty? *J Arthroplasty*. 2008 Dec;23:1110-4.

Ufrj's Einclusion Program. Pilot Group Profile

D. Xerez, Barroso L., Carvalho Ysv, Lima BC, Borges JA
Institution Rio De Janeiro Federal University (Ufrj)

Was Developed By The Nce-Ufrj, Aiming To Enable Computer Access To People With Motor Disabilities And Speech Problems. This Program Emulates The Use Of The Mouse And The Keyboard And

Allows The Activation Of Programs And Functions In Windows Platform. The Interaction With The Program Is Done Through Menus On The Screen When A Trigger, Like A Microphone Activated Through Breath, Is Set In. The Program Is Free Of Royalties, Therefore The Benefits For General Population Can Be Manifold. **Material and method.** We Admitted Tree Patients From The Neurology Department. Hsvs, Male, 30 Years-Old, Tbi In 2003, Spastic Tetraparesis Predominantly To R, Dysarthria And Cognitive Impairment. Ef, Male, 42 Year-Old, Als Diagnosed A Year Ago, Tetraparesis, Dysarthria And Dysphagia, Srst, Female, 49 Year-Old, Als Diagnosed 20 Years Ago, Tetraparesis, Dysarthria, During Two Months, This Group Was Trained Two Times /Week Using Microfenix With The Assistance Of A Computer Science Trainee, A Speech Therapist And An Occupational Therapist. The Program Was Installed On A Pc, Equipped With A Microphone. **Result.** Af Ter 16 Training Sessions , All Patients Were Able To Access The Internet At Home Independently, Participating In Instant Conversations Between Them. We Consider The End Of Training When The Team Receives An E-Mail From The Patient. **Conclusion.** The Use Of The Computer Guaranteed Accessibility And Independence For Our Patients. Thus, They Made Gains In Their Life Quality, Autonomy, Independence And Social Inclusion

References

Borges JA, Watanabe MK. Teclado Amigo: Um Sistema Para Acesso Alternativo A Computadores Para Portadores De Deficiências Motoras Severas. *Temas Sobre Desenvolvimento*, São Paulo, V. 10, N. 58/59, 2001.; HYPERLINK "http://intervox.nce.ufrj.br/motrix.3-BORGES" \n _blank Http://Intervox. Nce.Ufrj.Br/Motrix.3-Borges, J. A. - Dosvox - Um Novo Acesso Dos Cegos A Cultura E Ao Trabalho. *Revista Benjamin Constant*, Rio De Janeiro, V. 3, P. 24-29, 1986.

Complications of geriatric rehabilitation

J. Krajnov, G. Devečerski, B. Novakovic, A. Knezevic, S. Pantelinac

Clinic for medical rehabilitation, Clinical center of Vojvodina, Novi Sad, Serbia

Introduction. The trend of geriatric rehabilitation is short acute and subacute rehabilitation hospital and continued rehabilitation at home because of the greater frequency of complications in hospital conditions, overloading of institutions and increasing costs of treatment. Purpose: To determine the frequency of complications in geriatric rehabilitation in hospital and home conditions. **Materials and methods.** Prospective study was conducted on a sample of 71 subjects, aged 65 years and more, with reduced functional capacity due to acute pathological states without disorder of communication and social status. In 34 patients rehabilitation was conducted at home, while 37 respondents seemed to hospital rehabilitation control group. In all subjects was performed multidimensional geriatric assessment before, during and after rehabilitation. Applied the standard protocols and procedures for rehabilitation. Criteria for exclusion from the study was the occurrence of complications, which represent the absolute contraindication of rehabilitation. Was followed by complications during the rehabilitation of the standard diagnostic tests. **Results.** In the course of rehabilitation at home in 2 (6%) of respondents appeared complications, hypertensive crisis and osteomuskular complications. In the control group 14 (27%) patients had complications. Urinary infections had 4 patients, cardiac complications 3, deterioration of mental status 3, flebotrombosis 2, pneumonia 1, and gastrointestinal complications of 1 candidate. In both groups the complications are caused by patients with moderately limited and insufficient functional capacity. The results showed that a significantly higher incidence of complications (x2 = 8:59, p <0.005) in the control group. **Conclusion.** The hospital geriatric rehabilitation follow higher frequency of complications, and the most common complications were urinary infections, deterioration of mental status and cardiovascular complications.

Prevalence of Dysphagia in Parkinson disease: a potentially underestimated dangerous condition

A. Giusti¹, M. Giambuzzi², P. Da Rin Della Mora¹, M. Simonini¹, P. Tognetti¹, L. Baratto¹

¹*U.O. Medicina Fisica e Riabilitativa, Ospedale La Colletta, ASL 3 "Genovese"*

²*U.O. Cardiocirurgia Osp. San Martino, Genova*

Introduction. Dysphagia in Parkinson disease is often underestimated until its complications have already occurred. Actually dysphagia can develop even in the very early phases of the disease

worsening the clinical course and disturbing therapy assumption and rehabilitation program. Our target is verify the prevalence of dysphagia in patients affected by Parkinson's disease observed in the outpatient section of our Rehabilitation Unit. **Materials and methods.** A group of 42 consecutive patients, 21 male (50%) and 21 female, mean age 70 years (Range 88/39), affected by Parkinson's disease, were followed by our institution in 2009 and submitted to swallowing assessment. Swallowing evaluation was carried out with bedside examination method completed with fiberoptic evaluation. The O'Neal scale was applied to estimate the severity of dysphagia. Statistical analysis was performed with contingency analysis setting a confidence limit of 95% and using Fisher nonparametric test. **Results.** 26 patients (61.9%) showed swallowing impairment; among them, 18 had referred dysphagia-related symptoms, but surprisingly 8 of them were asymptomatic (one third of the asymptomatic group, the 19.05% of global patients), but requiring anyway treatment to avoid complications. **Conclusion.** In our experience, swallowing evaluation is strongly suggested in all people affected by Parkinson's disease even in the early phases also if dysphagia is not referred by the patient, as the 19% of them shows dysphagia. Further studies on larger populations is advisable to better define the actual prevalence of dysphagia in Parkinson disease.

References

Ashford, J, et al. Evidence-based systemic review: Oropharyngeal Dysphagia behavioral treatments. Part III-Impact of dysphagia treatments on populations with neurological disorders JRRD 2009; 46(2):195-204
 Evatt M.L., et al. Dysautonomia rating scales in Parkinson's disease: sialorrhea, dysphagia, and constipation-critique and recommendations by movement disorders task force on rating scales for Parkinson's disease Mov Disord. 2009 Apr 15;24(5):635-46
 O'Neil K.H., et al. The dysphagia outcome and severity scale Dysphagia 1999; 14: 139-145

Diagnosis of Neurogenic TOS; Proximal brachial plexus latency difference by magnetic stimulation, a preliminary study

Gholam Reza Raissi, Tannaz Ahadi, Bijan Forough
Physical Medicine and Rehabilitation Dpt, Iran University of Medical Sciences, Firoozgar Hospital

Introduction. Proximal cervical plexus lesions are not electrodiagnostically accessible especially in diagnosis of true neurogenic thoracic outlet syndrome(TOS). Formerly proximal root has been studied by motor evoked potentials (MEP). Amplitude of MEP response has been studied elsewhere. However stimulation from brain and motor diminishes diagnostic value of MEP and it has been shown that conduction block cannot be well studied by MEP. Our study aims to evaluate proximal conduction at brachial plexus and comparison of findings with two typical case of neurogenic TOS. **Materials and methods.** After taking written consent, Magnetic stimulation of the nerve roots at C7 vertebral prominence and, midline of clavicle by several stimulations with increasing intensity was done until stable wave in 3 consecutive responses was recorded. Muscle responses were recorded from thenar area. Peak to peak latency of both sides were compared in two cases of neurogenic TOS proven by EMG and NCV and 10 cases with normal EMG and NCV findings. **Results.** Ten female normal cases with 41.5±8.3 years age range were evaluated. latency difference of right side was 0.4±2.5 milliseconds (ms) and 0.4±2.4 ms in left side. Maximum difference between two sides was 0.6 ms .While in neurogenic TOS cases , the latency of affected side was 1.6 and 2.0 and the difference between two sides was 1.5 and 1.6 respectively. **Conclusion.** This technique seems a promising way to confirm diagnosis of Neurogenic TOS .

Valorization of the rehabilitation after cerebrovascular insult by ET test

E. Tanovic, H. Tanovic
University Clinical Center in Sarajevo, Clinic for Psychiatry and Rehabilitation

Introduction. We have wanted to present the use of different outcome measures in stroke patients. BI and RAP indexes are employed in the evaluation of rehabilitation results but none of those cover all sequelae that remain after cerebrovascular accident. We have established an ET-test which covers all sequelae caused by cerebrovascular accident. **Materials and methods.** We created two comparative groups, tested by employing appropriate tests.

The first one, examine group, consists of a 100 of examinees and they were all examined by employing an ET-test. The second, is the control group and includes 200 examinees. This group consists of 100 examinees tested with BI index and group 100 examinees tested with RAP index. All patients were analyzed according to gender, age, duration of rehabilitation and results of it at the time of their admission and at the time of their dismissal. **Results.** In all groups, the majority of patients were age 56-65, followed by those whose age was 66-75 years. In the studied A group, rehabilitation lasted from 4 to 22 weeks and in the control B group – from 8 to 20 weeks. In the studied group, rehabilitation results presented by ET-test showed an increase, being in the interval 3-67 at the time of admission and in the interval 10-84 at the time of dismissal. In the control group of examinees for B1 group, BI index was at the interval from 0 to 8 at the time of admission and 2 to 14 at the time of dismissal; RAP index was at the interval from 8 to 18 at the time of admission, while at the time of the dismissal it was from 0 to 10. **Conclusion.** ET-test is a new test and is comprehensive, precise, clear and more objective in the evaluation of rehabilitation results after cerebrovascular accident.

References

Tanovic dr. Edina, ass. prof. Med. ARH 2007; 61 (2): 82-85; Med ARH 2008; 62: (1): 38-40. Med ARH 2009;63 (1) Health MED; Vol 3/No 1/2009; 61-65.
 Bosnian Journal of Basic Medical Sciences 2009;9(1): 49-53. Folia Medica 2008; 43 No 2: 84-88. . . Neurol Croat. 2007; 56 (Suppl.1):188-194.

Forestier's disease and stroke: differential diagnosis of dysphagia

L.L. Montesinos-Magraner, M. Velasco-Zaruelo, A. Ruiz-Eizmendi, T. Herrero Iscar
Dysphagia and Speech Unit. Physical medicine and rehabilitation department. Vall d'Hebron Hospital, Barcelona. Spain.

Introduction. Forestier's disease or diffuse idiopathic skeletal hyperostosis is a systemic reumatological abnormality of unknown aetiology. It produces calcification-ossification of the anterior longitudinal ligament. The low dorsal region is the most affected in the raquis. These patients are typically asymptomatic or with few symptoms (minimal joint pain, spinal pain, stiffness). Dysphagia is the most common symptom when the disease affects the cervical spine; less frequent is dyspnea, both secondary to extrinsic compression of the oesophagus and trachea. Neurological complaints are quite rare. **Materials and methods.** We present an 83 years-old man with oropharyngeal dysphagia to solid foods primarily and clinical history of stroke. All the literature was reviewed. **Results.** An 83-year-old man was seen with the main complain of increased difficulty in swallowing solid food over the past two years. Over the past six months he had altered his diet to include only soft foods and liquids and he had an approximately 6 kg weight loss over that period of time. His medical problem included hyperglycaemia and right thalamic lacunar stroke with left hemiparesia. On physical examination, the patient had not gag reflex and had lower cough reflex. We could see at videofluoroscopic swallowing evaluation (VSE) impaired pharyngeal squeeze and discoordination at propulsive phase of tongue action, vallecular and pyriform retention with overflow laryngeal penetration without pharyngeal clearance, and osteophytes C2-C3 and C4-C5. With the diagnosis of Forestier's disease the resection of the both osteophytes by orthopaedic surgery was performed in two times. After that the patient received speech therapy and dietetic recommendations. The degree of dysphagia worsened primarily, but gradually improved and 5 months later he had not aspirations at VSE and had gained weight. **Conclusion.** The differential diagnosis is the most important to distinguish between neurologic dysphagia or dysphagia for solids, and as a result to choose the best treatment for each patient.

Case report: udd's myopathy in a spanish patient.

L.C. Garrote-Moreno, E. Pellicer-Fernández, M.J. López-García, C. Corrochano-García, J.V. Lozano-Guadalajara, E.A. Sevilla-Hernández, R. López-Lozano, M.A. Giménez-Abadía
Physical Medicine and Rehabilitation Unit. Morales Meseguer Hospital. Murcia. Spain.

Introduction. Tibial muscular dystrophy or Markesbery-Griggs/Udd's distal myopathy is a rare disease of autosomal dominant late onset (> 40 years) due to mutations of the gene of titin protein (TTN) localized in 2q31-33 described in Finnish, French and Belgian families. It concerns predominantly *Tibialis anterior muscles*.

The face and upper extremities muscles, sensibility and reflex are not involved. The disease course is slow and does not cause too much disability. Creatin Kinase (CK) level is normal or slightly elevated. The loss of gait control is exceptional. We describe the case history of a patient with Udd's Disease attended in Rehabilitation Unit of Morales Meseguer Hospital during 2009. **Materials and methods.** The revision of clinical history permitted us to obtain clinical evaluation, CK levels, electromyographic, muscular biopsy, magnetic resonance and genetic results. **Results.** A 23-year-old woman affected of gait abnormalities, muscle weakness and pain in low extremities. Muscular analysis showed *Tibialis anterior* (she was not able to stand on her heels), *Cuadriceps femoris* and *Gluteus maior-medius* weakness with *Gastrocnemius* asymmetric atrophy. The adaptation of an ankle-foot orthoses and a stretching program made a gait improvement. **Conclusion.** The prescription of orthoses and adapted rehabilitation program based on specific clinical assessment is essential to improve disability in patients with distal myopathy and gait disorders.

References

1. Aparicio-Meix JM. Distrofias musculares y síndromes miotónicos. *Medicine* 1998; 7(100): 4645-4656.
2. Robles-Cedeño R, Rojas-García R et al. Miopatía distal de Markesbery-Udd: descripción clinicogenética de una familia española. *Neurologia* 2006; 21(9): 455-550.
3. Seze J, Udd B, Vermersch P. Tibial muscular dystrophy. A rare form of distal myopathy. *Rev Neurol (Paris)*. 1999 Apr; 155(4):296-305. Penisson-Besnier I. Distal myopathies. *Rev Neurol (Paris)* 2004 Feb; 160(2):211-6.
4. Barohn R, Amato A, Griggs R. Overview of distal myopathies: from the clinical to the molecular. *Neuromuscular Disorders* 8 (1998): 309-316.
5. www.asem-esp.org

Botulinum Toxin: A Refinement in the Management of Facial Nerve Palsy Sequelae

V. Roque, R. Nascimento, I. Machado Vaz, F. Parada, M.J. Festas
Hospital São João, O' Porto, Portugal

Introduction. Peripheral facial nerve palsy (FNP), more commonly idiopathic (Bell's Palsy), is still involved in controversy regarding etiology and treatment. The majority of patients recover completely, but approximately 10% may have significant residual aesthetic and functional impairment. Recovery from facial palsy might be associated with transient or persistent asymmetries ranging from nerve hypofunction (paresis or paralysis) to hyperfunction (synkinesis or spasm). The affected side is often distorted by the excessive pull of the normal contralateral face during emotional expression. **Materials and methods.** A total of five patients with residual facial asymmetry and/or synkinesis after FNP were injected with botulinum toxin type A. Injection sites were chosen on a case-by-case basis. Effectiveness of the botulinum toxin injections on facial symmetry and synkinesis was assessed subjectively by patient self-appreciation. In addition, three medical doctors, unblinded to treatment status, made static (relaxed state) and dynamic (maximum contraction) assessments using photographic and video documentation. **Results.** This case series demonstrated a significant reduction in hyperkinesis and facial asymmetry. The patients' self-assessments showed improvements in their appreciation of the facial symmetry, reduction of synkinesis, ability to go out in public, and feelings of self-worth. **Conclusion.** The results suggest that a judicious use of botulinum toxin, may improve facial symmetry and effectively decrease contralateral hyperkinesis, improving the symmetry and overall appearance of the face, which is greatly appreciated by patients.

References

1. Salles AG, Toledo PN, Ferreira MC. Botulinum toxin injection in long-standing facial paralysis patients: improvement of facial symmetry observed up to 6 months. *Aesthetic Plast Surg*. 2009 Jul;33(4):582-90. Epub 2009 Mar 28.
2. Toffola ED, Furini F, Redaelli C, Prestifilippo E, Bejor M. Evaluation and treatment of synkinesis with botulinum toxin following facial nerve palsy. *Disabil Rehabil*. 2010 Feb 15.

Effectiveness of the treatment with peri-tendineous injection of hyaluronic acid in degenerative tendinopathy

A. Rocco^{1,3}, C. Ljoka^{2,3}, G. Tancredi^{2,3}, C. Foti^{2,3}

¹INI Medicus Monteripoli Rehabilitation Clinic, Tivoli (Italy)

²PRM Chair, Doctorate and Specialization School, Tor Vergata University, Rome (Italy),

³Instrumental Semeiotic Division SIMFER

Introduction. Sodium Hyaluronate are glycosaminoglycans with unbranched polysaccharide chain, formed by residual of glucuronic acid e N-acetylglucosamina. Polymers are organized in a reticular structure with high density and clear macroscopic aspect and a microscopic structure able to guarantee idration, plasticity e viscosity of tissue. The aim of the study is to appraise the efficacy of injection treatment of hyaluronic acid with different molecular weight in patients affected by degenerative tendinopathy. **Materials and methods.** Forty patients suffering from degenerative condition of Achilles tendon (1) and of III-IV hand flexor tendon (2) were subjected to a cycle of number 3 infiltrations of hyaluronic acid with different molecular weight (MW 500-1200 Kdalton) once a week. The Physiatic evaluation was completed by instrumental examination by a system consisting of echographic linear probe (10,5-12,5 Mhz) (3), a Power Doppler examination and with the administration of rating scales of mobility and pain (VAS and Rivermead Mobility Index, Test of manual dexterity). Infiltrative treatment was performed after locating the degenerated area through the ultrasound examination with a multiple dosing peri-tendon using a 'needle, 25 G 0.5 X 16 mm. **Result and conclusion.** The patients evaluated at 6 weeks after the third infiltration have presented a significant improvement in clinical parameters with reduction of pain, improvement of range of movement (ROM) and consequent reduction of disability related to the underlying condition. A preliminary analysis of data showed a different behavior of the drug as a function of molecular weight and the seat of inoculation.

References

1. Effect of hylan G-F 20 in Achilles' tendonitis: an experimental study in rats. Tatari H, Skiak E, Destan H, Uluku_ C, Ozer E, Sato_lu S. *Arch Phys Med Rehabil*. 2004 Sep;85(9):1470-4. PMID: 15375818 [PubMed - indexed for MEDLINE]
2. Ultrasound-guided hyaluronic acid injection in carpo-metacarpal osteoarthritis: short-term results. Salini V, De Amicis D, Abate M, Natale MA, Di Iorio A. *Int J Immunopathol Pharmacol*. 2009 April-June;22(2):455-460. PMID: 19505398 [PubMed - as supplied by publisher]
3. Open pilot study of ultrasound-guided intra-articular injection of hylan G-F 20 (Synvisc) in the treatment of symptomatic hip osteoarthritis. Migliore A, Tormenta S, Martin IS, Valente C, Massafra U, Granata M, Alimonti A. *Clin Rheumatol*. 2005 Jun;24(3):285-9. Epub 2004 Dec 9. PMID: 15592903 [PubMed - indexed for MEDLINE]
4. Efficacia del trattamento infiltrativo con acido ialuronico nella tendinopatia degenerativa dell'achilleo A. Rocco, G. Tancredi, C. Foti (Roma) 37° Congresso Nazionale SIMFER 20-23 Settembre 2009, Campobasso

Botulinum Toxin Type A Injections for Management of Spasticity in Children with Cerebral Palsy – Where are We Now?

V. Roque, I. Machado Vaz, M.J. Festas, F. Parada
Hospital São João, O' Porto, Portugal

Cerebral palsy (CP) is a non-progressive clinical syndrome that occurs after damage to the developing brain, resulting in a variety of deficits. The spastic motor type is the most common form of CP. Spasticity is considered to be a main contributor to function impairment and, due to prolonged muscle shortening, results in multiple deformities. Therefore, when managing CP in children, reduction of spasticity is crucial. Several treatment options, including botulinum toxin type A (BTX-A) injection, have been used to reduce the spasticity and to improve functions in children with CP. Botulinum toxin type A injections are indicated for use in pediatric patients with CP to: (1) improve motor function; (2) improve the quality of life by decreasing spasticity and/or decreasing caregiver burden; (3) decrease pain from spasticity; (4) enhance self-esteem by diminishing inappropriate motor responses; and (5) provide a presurgical diagnostic tool. Though there have been many reports demonstrating that BTX-A can reduce the spasticity in lower limbs improving locomotor ability in children with spastic CP, relatively few studies are available on the use of BTX-A in the management of upper limb spasticity. Many issues of concern remain associated with improving the outcome from BTX-A injections: (1) selection of target muscles, (2) localization of target muscles, (3) injection technique, and (4) analgesia during the procedure in children undergoing botulinum toxin injections for focal spasticity. We aim to review current clinical practice guidelines concerning injection techniques, localization of target muscles and procedural analgesia in children with CP.

References

1. Koman LA, et al. Spasticity associated with cerebral palsy in children: guidelines for the use of botulinum A toxin. *Paediatr Drugs*. 2003;5(1):11-23.
2. Kinnett D. Botulinum toxin A injections in children: technique and dosing issues. *Am J Phys Med Rehabil*. 2004 Oct;83(10 Suppl):S59-64

Evolution of dysphagia in stroke patients after swallowing rehabilitation

L. Bubbico¹, V. D'Annunzio¹, I. Aprile¹, E. Moore¹, L. Padua^{1,2}

¹Fondazione Don Carlo Gnocchi - Centro Santa Maria della Pace, Rome

²Università Cattolica del Sacro Cuore, Dipartimento di Neurologia, Rome

Introduction. Oropharyngeal dysphagia frequently occurs in stroke patients. This study shows the effects of the swallowing therapy in a sample of stroke patients enrolled in our rehabilitation centre. Moreover, the influence of disability on the dysphagia evolution was evaluated. **Materials and methods.** Forty-eight consecutive stroke patients, 34 ischemic and 14 hemorrhagic, 26 male and 12 female, with mean age 74.4 years (from 36 to 89), were included. A complete swallowing evaluation, including bed side examination, water test, pharyngeal sensation and Fiberoptic endoscopic evaluation of swallowing (FEES), was performed. Moreover the functional severity of dysphagia was assessed by The Dysphagia Outcome and Severity Scale (DOSS). For disability assessment we used Barthel Index. The dysphagia and disability evaluation was conducted at admission and at discharge, after about 8 weeks (mean: 61.6 days) of neurological and swallowing rehabilitation. **Results.** Thirty-eight stroke patients (80% of the cases) presented dysphagia: 18 (47%) moderate dysphagia, and 15 (39%) severe dysphagia. At discharge, 18 patients (47,3%) recovered a normal swallowing, 9 patients (23,6%) had a physiologic swallowing with an adequate oral diet restriction, 6 were nourished through SNG or PEG. The comparison between the patients with improvement of dysphagia after swallowing therapy and the patients with persistent severe dysphagia at admission, showed a significantly lower Barthel Index score in the latter group ($p < 0.001$). **Conclusion.** This study sustains the usefulness of a complete swallowing evaluation (bed side examination, water test, pharyngeal sensation, FEES and DOSS) to evaluate the occurrence and evolution of dysphagia in stroke patients undergo to swallowing therapy. This evaluation is an economic and objective procedure to evaluate the severity of dysphagia and to define a specific treatment for a successful recovery.

References

- Martino R, Pron G, Diamant NE. Screening for oropharyngeal dysphagia in stroke: insufficient evidence for guidelines. *Dysphagia*. 2000;19:30.
 Martino R, Pron G, Diamant NE. Oropharyngeal dysphagia: surveying practice patterns of the speech-language pathologist. *Dysphagia*. 2004;19:165-176.
 Bloem BR, Lagaay AM, van Beek W, et al. Prevalence of subjective dysphagia in community residents aged over 87. *BMJ* 1990;300:721-722

Botulin Toxin- Type A (Bont-A) In Congenital Facial Palsy: A Case Report

D. Xerez, L. Barroso, Y.S.V. Carvalho, P. Rocha
 Rio De Janeiro Federal University (Ufrj)

Introduction. Since Its Development, The Bont-A Use Has Been Extended By Health's Area . In Facial Palsy (Fp), Its Use Is Accepted If There Are Hyperkinesias In Affected Hemiface. When Congenital, Depending On The Structure Injured, Is Flaccid, Determining An Asymmetrical Development, Severe Speech Articulation, Mastication And Eye Occlusion Inability. In This Case, The Bont-A Aims To Reduce The Strength Of The Innervated Muscles Side So Increasing Movement Harmony Reducing The Excessive Mid Line Displacement. **Materials and methods.** Acsf, Fem, Bras, Born In Maranhão, 39 Years-Old, Underwent 10 Corrective Surgeries In The Face From The Childhood. Presented, Asymmetry, Lagophthalmos With Dry Esclera. Chemodenerivate The Right Hemiface With Bont-A 500u (Dysport®) Diluted In 3 Ml Of Saline In The 1ml Bd Ultra Fine Syringe 25u/Point Distributed In: Frontal, Corrugator, Zygomatic Major, Zygomatic Minor And Risorio. Final Doses Was 125 U Of Bont-A. Re Evaluation (15 Days After), Measured In Video Using The Software Sapo. **Results.** The Displacement Of The Mid Line Of The Upper Lip Decreased 63.6% Over The Basic Measure, And The Medial Border Of The Eyebrow 20%. At Other Points The Displacement Reduction Was 10%Average . The Patient Reported Great Satisfaction With The Outcome. **Conclusion.** The Anti-Cholinergic Effects Of Bont-A Has Broad Job That Deserves To Be Contemplated When The Pathology Is Mediated Or Resulting From Their Action

References

- HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank Defazio G, Abbruzzese G, Garla da P, Vaca E et al. Botulin Toxin A Treatment In

Primary Facial Spasm:10 Years Multi-Center Study- Arch Neurol 2002;59(3):418-202-;Matarasso, A; Deva, Ak. HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank Botulinum Toxin .Plastic And Reconstructive Surgery: October 2003 - Volume 112 - Issue 5 - Pp 55s-61s HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank 3- HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank Yoshimura Dm., Aminoff Mj., Tami Ta., Scott Ab HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank . HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank Treatment Of Hemifacial Spasm With Botulinum Toxin Muscle & Nerve, Sept 1992volume 15 Issue 9, (P 1045-1049); Zagui Rmb, Matayosh S, Moura Fc. Efeitos Adversos Associados A Aplicacao De Bont-A Na Face: Revisao Sistemtica Com Meta-Analise. Arch Bras Oftalmol 2008;71(6);894-901 ;Lowe Bd; Accuracy And Validity Of Observational Estimates Of Shoulder And Elbow Posture, Applied Ergonomics 35 (2004) 159—171 HYPERLINK "http://sapo.incubadora.fapesp.br/portal" Http://Sapo.Incubadora.Fapesp.Br/Portal HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank

Patients with spina bifida and bladder cancer. Our experience

E. Pagès, L.L. Montesinos, M. Meléndez, S. Rodríguez, A. Cuxart
 Spina Bifida Unit. Vall d'Hebron Hospital. Barcelona. Spain.

Introduction. Patients with neurogenic bladder dysfunction due to spina bifida have been reported to be at increased risk for bladder cancer. The publications suggest that intermittent or permanent catheterization, bacteriuria, bladder calculi and bladder augmentation are a significant risk factor. We reviewed our experience with treating patients with spina bifida and bladder cancer. **Materials and methods.** Patients with spina bifida treated for bladder cancer between 1990 and 2010 were identified. Patient demographics, mode of bladder management, risk factors and presenting symptoms were recorded along with therapy, pathological findings and outcome. A review of all known published studies was made. **Results.** We found four patients with a mean age of 32.75 years old, one man and three women. Any patient had undergone bladder augmentation. Three patients used as mode of bladder management intermittent catheterization or permanent urethral catheter, and the male had used collector and had been diagnosed of repetitive bladder calculi. Abdominal pain was the first presenting symptom in two patients, hematuria in another one and the last one was diagnosed because of an ureteral obstruction. All of them had previous history of recurrent urinary tract infections. 75% patients had locally advanced stage (T3 or greater) or lymph node metastases at the time of diagnosis. Two patients had died at the time of the study. **Conclusion.** Bladder cancer should be considered on in this patient population, even in young adult women. Therefore a complete screening would be beneficial for earlier detection and improved outcomes in every spina bifida patient with hematuria or chronic infection.

References

- Austin JC, Elliott S, Cooper CS. Patients with spina bifida and bladder cancer: atypical presentation, advanced stage and poor survival. *J Urol*. 2007 Sep;178(3 Pt 1):798-801.

Peripheral Nerve Blocks in Spasticity Treatment

V. Roque, M. Agre, M.J. Festas, F. Parada
 Institution: Hospital São João, O' Porto, Portugal

Muscle spasticity causes pain, disability and difficulties in the rehabilitation of patients with upper motor nerve disease such as stroke. Peripheral nerve blockade injections reduce the tone of overactive muscles in order to restore the appropriate balance between agonists and antagonists and are one of the therapeutic possibilities to treat acquired spasticity of various muscles. Neuromuscular blockade using phenol provides long-term chemical neurolysis through destruction of the peripheral nerve. The onset of action is within hours, whereas the duration of action is variable, ranging from 2 weeks to 6 months and beyond. Neurolytic blocks are possible in most motor nerves of the upper and lower limbs with the pectoral, median, obturator, tibial and musculocutaneous nerves being the ones more frequently treated. The advantages of phenol chemodeneration lie in its' low cost and lack of antigenicity. The disadvantages include the technical difficulty of the injections, significant risk of pain as a result of treatment, tissue destruction with chronic sensory side effects, and lack of selectivity on motor function. Percutaneous neurolytic procedures should be done as early as possible, as soon as spasticity becomes painful and disabling in patients with neurologic sequelae of stroke, traumatic brain injury or

any lesion of the motor neuron. Neurolytic agents and botulinum toxin may be used in combination, to allow a therapeutic action, in clinical situations of severe spasticity, without going beyond the maximal recommended dose. The authors report four patients with upper motor nerve disease and severe spasticity who were treated with a combination of both botulinum toxin and phenol injections.

References

1. Elovic EP, et al. Chemodenervation and nerve blocks in the diagnosis and management of spasticity and muscle overactivity. *PM R*.2009 Sep;1(9):842-51.
2. Viel E, et al. Peripheral nerve blocks and spasticity. Why and how should we use regional blocks? *Presse Med*.2008 Dec;37(12):1793-801.

Static and dynamic balance modifications after treatment of focal spasticity with botulinum toxin

E. Cosentino, M. Tiozzo, F. Piccione, A. Merico, P. Tonin
IRRCSS San Camillo, Venezia-Lido

Introduction. the aim of this study is to evaluate and quantify the effects on balance, posture and postural strategies of Botulinum Toxin inoculation in adult's leg muscles with focal spasticity through the observation of changes in barycentre, in postural oscillations and in somatosensory, visual and vestibular afference. **Materials and methods.** 8 patients with spasticity in the leg's muscles so high to interfere with the correct posture and with the static and dynamic balance, underwent an injection of botulinum toxin. Before treatment and 20 days after, patients were evaluated with a cinematic and stabilometric study in a modifiable environment by using the Smart Balance Master. The parameters considered were: assessment of body barycentre with opened and closed eyes during the oscillation of the system platform or walls; sensory analysis through the observation and differentiation of somatosensory, visual and vestibular afference; joint compensation strategies; analysis of postural oscillations; study of trajectories and speed to achieve an end-point in a stable and dynamized situation. **Results.** After the botulinum toxin treatment we observed an overall improvement of the data considered. There was a better control of body barycentre, both with eyes opened and closed, and a decrease in postural oscillations as demonstrated by the analysis of balls (gomitoli!). The trajectories for reaching the proposed end-point were improved and in some patients the recovery of the ability to achieve the target in the injured side and a reduction of compensation strategies in the exercise execution were observed. The sensory analysis showed an improvement of the somatosensory components in the recovery of balance compared to the visual and vestibular ones, but difficulties during the dynamic situation persisted. **Conclusion.** In this study the efficacy of botulinum toxin in reducing spasticity and the disappearance of foot clono destabilizing effect is also supported by an increased barycentric and postural control. The foot's more physiological contact to the ground brings about better stability and improved balance control, shown by the decrease in the number and speed of postural oscillations and by the increase in ability to achieve a predetermined end-point resulting in an improvement of the patient's functional abilities.

Therapeutic possibilities for complaints of arm, neck and shoulder to office workers

A. Totorean, A. Nita, C. Cristea, R. Onofrei, R. Dragoi
"Victor Babes" University of Medicine and Pharmacy Timisoara, Romania

Introduction. Office workers complaints of arm, neck and shoulder (CANS) are recognized in medical practice and literature. The term CANS is an umbrella for symptoms like pain, tenderness, numbness and tingling which can differ in severity from mild, periodic symptoms to severe, chronic and debilitating conditions [1]. The aim of this study was to evaluate the therapeutic effects of physical therapy and exercises for complaints of arm, neck and shoulder to office workers. **Materials and methods.** 54 office workers with CANS, patients of our clinic, were included in the study. We distribute them in two lots: lot 1 (n=30), lot 2 (n=24). For both lots the first therapeutic approach was analgesic physical therapy, mobility and stretching exercises, patient education about ergonomic workplace, correct posture and non sedentary lifestyle. In addition patients of lot 2 were trained for a short program (10 minutes) of stretching exercises which can be applied during working hours, 2-3 time per day. We evaluated subjects at their first visit to the clinic, after physical therapy cure and after 6 month. The most frequent symptoms –

pain, cervical tenderness, numbness and tingling was appreciated from subjects in scales from 0 (absence) to 4 (severe). For work quality was applied a similar scale: 4 poor performance at the job, 0 normal performance (not affected by CANS). **Results.** To the end of physical therapy program patients of both lot indicated symptoms improvements. After 6 month workers who performed the stretching exercises program indicated better score in all investigated items. **Conclusion.** A complex physical therapy approach is effective in acute and subacute period of CANS. Short stretching programs during office hours relieve pain and improve the quality of work.

References

- Eltayeb S, et al – "Prevalence of complaints of arm, neck and shoulder among computer office workers and psychometric evaluation of a risk factor questionnaire" - *BMC Musculoskeletal Disorders* 2007, 8:68

Outcomes after a complex rehabilitation program in patients with knee osteoarthritis – preliminary results

A. Totorean, R. Onofrei, D.V. Poenaru, D. Nemes, A. Nita, C. Cristea
"Victor Babes" University of Medicine and Pharmacy Timisoara, Romania

Introduction. The aim of this study was to evaluate the effectiveness of a supervised rehabilitation program in people with moderate knee osteoarthritis, a painful, and debilitating disorder. These are preliminary results of a prospective non-randomized study. **Materials and methods.** We evaluated 89 patients (mean age 61.45±8.01 years) diagnosed with knee osteoarthritis. A rehabilitation program including physical modalities for pain management, manual therapy, an exercise-based program to improve joint mobility, muscle strength, balance and gait, and a home exercise program for 4 weeks was applied. A KOOS score was used for evaluating the outcomes, initially and at 4 weeks. **Results.** 79.78% of patients completed the rehabilitation program and functional evaluations. Clinically and statistically improvements were seen in 91.55% of patients (n=65) at 4 weeks. All KOOS scores showed an increase with 14.04% for pain, 21.15% for symptoms, 13.25% for ADL, 8.01% for sports/recreational activities, and 20.58% for quality of life over the baseline scores. **Conclusion.** A complex supervised rehabilitation program is efficient in pain and functional improvement in the treatment of patients with knee osteoarthritis. A long term follow-up is needed for evaluating the outcomes over time.

The quality of life after in patients with total hip replacement after aquatic exercises

A. Totorean, C. Cristea, R. Onofrei, A. Nita, R. Dragoi
"Victor Babes" University of Medicine and Pharmacy Timisoara, Romania

Introduction. Total hip replacement (THR) for advanced primary and secondary osteoarthritis (OA) is among the most successful orthopedic interventions having a positive impact on health-related quality of life (HRQoL). The aim was to evaluate the effect of aquatic exercises in patients with THR. **Materials and methods.** The present study included 62 patients (44 men, 18 women), mean age 57, 1±4,21 years, with THR for advanced primary and/or secondary coxarthrosis. All patients were checked-up clinically and were questioned according to SF-36, WOMAC functional index and VAS at the admission (6-th week after THR-) and in 3 and 6 month after admission. Patients were divided in two groups. Group A (n=31) performed aquatic exercises 45 minutes daily, 5 days/week and group B (n=31) performed a land based exercise program also 45 minutes daily 5 days/week. **Results.** In group A, after 3 months, mean pain on VAS decrease from 78 (at baseline) to 34 (56, 41% improvement) and after 6 months to 21 (73, 08% improvement). In group B mean pain decrease from 82 (at baseline) to 48 (41,46% improvement) after 3 months, and to 34 (58,54% improvement), after 6 months. After 3 months SF-36 improved with 35% in group A and with 20% in group B compared with baseline. At the end of the study SF-36 improved with 50% in group A and with 27% in group B. Regarding functional status after 3 months, WOMAC score increased with 20% in group A and with 13% in group B. After 6 months WOMAC score increased with 47% in group A and with 23% in group B. **Conclusion.** These results supported our hypotheses that aquatic exercises are more effective in improving pain, functionality and quality of life in patients with THR and should be constantly included in physical rehabilitation of these patients.

Clinical and Functional outcomes after knee replacement

A. Totorean, D.V. Poenaru, R. Onofrei, A. Nita, C. Cristea, B. Andor, J.M. Patrascu

"Victor Babes" University of Medicine and Pharmacy Timisoara, Romania

Introduction. Partial or total joint replacement is the optimal solution for many invalidating rheumatologic disorders. The aim of this prospective study was to evaluate algic and functional aspects after total knee replacement (TKR) in patients who followed a classical pre- and post-surgery rehabilitation protocol. **Materials and methods.** 57 patients (mean age 53.9 years) with TKR were evaluated for pain, stiffness and functional outcomes at 2, 4 weeks, 3 and 6 months after surgery, using the visual analog scale for pain, the Heleu and Neyret classification for stiffness and walking test for 6 minutes. The second aim was to identify the factors which had an impact on patients' evolution. **Results.** At 2 weeks post surgery, pain was present in 19.82% cases, with an intensity decrease at subsequent follow-ups. 89.34% patients had grade I stiffness, 7.59% had grade II stiffness and 3.8% grade III stiffness at 2 weeks evaluation. At final evaluation, only 2.81% had grade III stiffness and 0.86% a grade III stiffness. The 6 minutes walking test showed an increase of walking distance at 3 months follow-up, with no significant changes at 6 months. The main factors with a considerable effect on patients' evolution were thromboflebitis, obesity, other joint diseases, social and personal environment. **Conclusion.** Joint replacement with a proper pre- and post-surgery rehabilitation program seems to be the optimal solution for patients with invalidating knee disorders. Patients' compliance to the post-surgery rehabilitation protocol, in association with their comorbidities had a significant impact on clinical and functional evolution after TKR.

References

Heuleu JN, Neyret P. Conduit a tenir devant les raideurs postoperatoires du genou. Reunion annuelle SOFCOT, novembre 2001. Seance commune avec la Societe francaise de medecine physique et de readaptation. Rev Chir Orthop 2001;88 (5suppl):1S27-51)

Adherence to neck/back care in Activities of Daily Living: relevance of previous experiences and self-management habits

P. Escolar-Reina, F. Medina-Mirapeix, J.J. Gascón-Cánovas, J. Montilla-Herrador, S.L. Oliveira-Sousa, E. Navarro-Pujalte

University of Murcia. Spain.

Introduction. Determine the extent to which past experiences of patients with chronic neck or low back pain related to the use of rehabilitation services in previous episodes of pain and self-management behavioral habits affect adherence to professional' advice of postural techniques or movement for the self-care of back or neck during Activities of Daily Living (ADLs). **Materials and methods.** One hundred and eighty-four patients with chronic neck or low back pain were surveyed at the beginning and one month after treatment to determine their adherence to providers' counseling about neck/back care in ADLs. Outcome measures were overall adherence for a set of neck/back care counseling from a list. That list included postural strategies such as sleeping face down, using correct sitting posture, alternating body position, and using correct lifting technique. **Results.** Adherence to advises on neck/back care is more probably if patients have self-management habits for neck/back care, such as sleeping face down (adjusted OR: 5.3; $p < 0.05$) and alternating body position (adjusted OR: 3.8; $p < 0.05$). Previous physical therapy intervention was a good predictor of the overall adherence to the neck/back care in ADLs self-management strategies. **Conclusion.** Previous physical therapy intervention and habits for self-management strategies before intervention was strongly and positively associated with adherence to professional' advices for neck/back care in ADLs. This study was supported by the research grant from the Ministry of Health and Consumers Affairs (PI030317) Spain.

References

Smith BH, Elliot AM. Active self-management of chronic pain in the community. Pain 2005;113:249-50.

Development of a patient self-report questionnaire on continuity of care in hospital acute care

S.L. Oliveira-Sousa, F. Medina-Mirapeix, P. Escolar-Reina, J. Montilla-Herrador, E. Navarro-Pujalte, M. Sobral-Ferreira

University of Murcia. Spain.

Introduction. Most measures of continuity of care have not been constructed with input from patients. Current measurement strategies largely based on the perceptions of healthcare providers, such as chronological measures. Measurement of patient objective perceptions presents some advantages for evaluation. The purpose of the present study was to develop a questionnaire to assess continuity of care in physiotherapy from the perspective of patients. **Materials and methods.** Questionnaire was developed by a three-step process involving a total of 183 patients who had received physiotherapy during hospitalization. The item-generation process utilized input from 10 patients who participated in a qualitative study through in depth interview. A pretest cognitive using patient was conducted to assess the comprehension and relevance of the items. Pilot test was conducted by a survey with 162 patients. Item reduction was done using discriminative and reliability criteria. **Results.** Initial poll of 25 items was selected from first step. Ten items were rephrased and 3 eliminated from pretesting. In the pilot testing, 9 additional items were eliminated due either poor discriminative ability (7) or low stability (2) in a test-retest study. **Conclusion.** The development of the questionnaire was centred on the patient's perspective of continuity of care and testing of the items demonstrates good levels of reliability and validity. This study was supported by Foundation for Education and health research in the region of Murcia (project number PIEMCA06-12)

References

Dolovich LR, Kalpana MN, Ciliska DK, Lee HN, Birch S, Gafni A, et al. The Diabetes Continuity of Care Scale: the development and initial evaluation of a questionnaire that measures continuity of care from the patient perspective. Health and Social Care in the Community 2004;12(6): 475-487.

Searching factor structure of ICF-categories underlying to sub-domain 'Changing and maintaining body position'

F. Medina-Mirapeix, E. Navarro-Pujalte, M.E. Del Baño-Aledo, F.J. Jimeno-Serrano, P. Escolar-Reina, J. Montilla-Herrador

University of Murcia. Spain

Introduction. There have been several attempts to develop separate scales for upper and lower body mobility. Conceptual modeling and empirical testing are important in light of recent methodological advances that facilitate the growing trend to combine items across instruments for use in rehabilitation. The purpose of this study was to examine factor structure of a subset of ICF-categories relevant for musculoskeletal problems and selected from the sub-domain of mobility activities called 'Changing and maintaining body position'. **Materials and methods.** Psychometrical study based on data from a prospective multicentric cohort study in patients with musculoskeletal conditions in outpatient rehabilitation care. Patients were eligible if they were in physical therapy treatment and were 18 years or older. Patients were excluded if they were non-Spanish speaking or unable to answer self-report questionnaire. We developed a self-report questionnaire with X items from patients-oriented instruments which were linked to the ICF-categories. We evaluate underlying structure in 604 participants (mean of age 38.1; 74.8% men; 40.7% with a diagnosis involving upper extremities, 41% involving lower extremities and 18.4% involving the spine) using exploratory and confirmatory factor analysis. **Results.** Results from a initial exploratory factor analysis produced 2 distinct, interpretable factors that accounted for 68.7% of the variance: 'Changing and maintaining sitting and/or lying positions' (51.9%) and 'Changing and maintaining standing position' (16.8%); these two factors were verified by a confirmatory analysis. **Conclusion.** This 2-factor model can form the conceptual basis for exploring if is possible to construct clinical measures of functioning and, if yes, for leading to a comprehensive system of outcome instruments for outpatient rehabilitation care. Study supported by research grant from Foundation Mapfre Medicine. Spain.

References

Wolinsky et al. Rethinking functional limitation pathways. Gerontologist 2000; 40:137-46.
McHorney C. Generic health measurement: past accomplishments and a measurement paradigm for the 21st century. Ann Inter Med 1997; 127:743-750.

How does the selection and management of home exercise program for neck and low back pain patients influence their adherence

P. Escolar-Reina, F. Medina-Mirapeix, J. Montilla-Herrador, S.L. Oliveira-Sousa, M.E. Del Baño-Aledo, F.J. Jimeno-Serrano
University of Murcia, Spain

Introduction. Little evidence exists on which conduct carried by health care providers facilitates or impedes patient's adherence to home-exercise programs. The aim of this study is to explore perceptions of people with chronic neck or low back pain about how characteristics of home exercise programs and care-provider style during clinical encounters may affect adherence to exercises. **Materials and methods.** This is a qualitative study consisting of seven focus groups, with a total of 34 participants presenting chronic neck or low back pain. The subjects were included if they were receiving physiotherapy treatment and were prescribed home-based exercises. **Results.** Two themes emerged: home-based exercise programme conditions and care provider's style. In the first theme, the participants described their positive and negative experiences regarding time consumption, complexity and effects of prescribed exercises. In the second theme, participants perceived more bonding to prescribed exercises when their care provider presented knowledge about the disease, promoted feedback and motivation during exercise instruction, gave them reminders to exercise, or monitored their results and adherence to exercises. **Conclusion.** Our experiential findings indicate that patient's adherence to home-based exercise is more likely to happen when care providers' style and the content of exercise programme are positively experienced. These findings provide additional information to health care providers, by showing which issues should be considered when delivering health care to patients presenting chronic neck or back pain. This study was supported by the research grant from the Ministry of Health and Consumers Affairs (PI030317) Spain.

References

Hayden JA, van Tulder MW, Malmivaara AV, Koes BW. Meta-analysis: exercise therapy for nonspecific low back pain. *Ann Intern Med* 2005, 142:765-75.

Patients' perceptions about management care implied in rehabilitation care

S.L. Oliveira-Sousa, F. Medina-Mirapeix, P. Escolar-Reina, E. Navarro-Pujalte, M.E. Del Baño-Aledo, M. Sobral-Ferreira
University of Murcia, Spain.

Introduction. In recent years politicians and providers are struggling to increase debate on policies to promote continuity of care. However, few researches were conducted on this topic in rehabilitation care, especially from the patient perspective. The aim this study was to describe patient's experiences and perceptions of care that may have led them to perceive gaps in management continuity of rehabilitation care. **Materials and methods.** Qualitative study was conducted using in-depth interviews. Participated 10 patients who had received physical rehabilitation during hospitalization. The following steps were used in the analysis process: a first reading of all transcripts to get an overall impression of content; segmentation of the transcripts sentences or paragraphs and codification of related phrases; generation of themes or categories; and identification of any combination among themes or categories. **Results.** The participants felt that the care received from different providers were neither complementary enough nor connected in a coherent way. The participants too felt themselves as being their own providers, because their collaboration in strategies of self-management could be a complementary help for their rehabilitation. For participants, these gaps in management continuity were dependent on factors such as: 1) consistency of care among providers; and 2) implication of patient collaboration in their own management plan. **Conclusion.**

The findings indicate the patients perceive that management continuity of care must be consistent among providers and involve them in treatment. Efforts to improve patients' experiences may promote greater inpatient care and therefore should be a priority for providers implied in the rehabilitation care. This study was supported by Foundation for Education and health research in the region of Murcia (project number P1EMCA06-12)

References

Haggerty JL, Reid RJ, Freeman GK, Starfield BH, Adair CE, Mckendry R. Continuity of care: a multidisciplinary review. *BMJ* 2003; 327:1219-21.

Evaluation Of Late Hemiplegic Foot Dorsiflexion Using Motor Imagery: A Case Report

P. Rocha, D. Xerez, H. Neto, V. Portella, Gomesmm
Rio De Janeiro Federal University (Ufrj)

Introduction. Motor Imagery Therapy Uses The Tool Of Our Intellectual Capacity, Which Allows The Stronger Side To Stimulate The Weakest. The Neural Network Involved In Motor Imagery And Its Implementation Are Overlapping Premotor Parietal, Basal Ganglia and Cerebellum Areas. Thus, It Is Possible To Track Perceptual Changes And Modifications In Individuals Cortical Topography, Allowing The Construction of Body Image. These Bases Have Been Applied For The Recovery of Amputees With Phantom Pain, And Therapy With Mirror Box Awakened Interest In Neurological Rehabilitation. In Stroke, Sequelae, Such As Muscle Weakness, Lack of Coordination And Spasticity, Are Responsible For The Reduction In Life Quality Of People With Hemiplegia. The Dorsiflexion Is A Milestone In The Recovery Of Gait, And The Tools Used In Their Evaluation Deserve Special Attention. **Materials and Methods.** Efs, Female, 62 Years-Old, Hemiplegic Since 2000. Moderate To Severe Degree Of Disability Was Recorded On A Digital Camcorder Sitting ,Heels Supported, Elevating The Tip Of The Foot . We Requested 10 Repetitions Of The Movement Using The Mirror Box, After Training, The Affected Foot Was Removed From The Box And Shot, After Running The Movement Command. The Images Were Analyzed Using The Software Sapo. **Results.** The Patient Performed The Lifting Of The Forefoot With Plegic Ankle Inversion, Raising The Toe 2,7cm Of The Ground. **Conclusion.** The Use Of Motor Imagery Is An Invaluable Tool In Neurological Rehabilitation, Not Only In Therapy, But Also As Assessment Of Preservation Degree Of Motor Areas Spared By The Underlying Disease.The

References

Lance, 1984; Mayer, 2002; Barnes, 2003. Ramachandran U.S ,Ramachandran R. Center For Brain And Cognition, 0109, University of California, San Diego.Using Motor Imagery In The Rehabilitation Of Hemiparesis. Jennifer A. Stevens, Phd, Mary Ellen Phillips Stoykov, Ms, Otr/L; Arch. Phys Med Rehabil Vol 84, July 2003. Lowe Bd; Accuracy And Validity Of Observational Estimates Of Shoulder And Elbow Posture, Applied Ergonomics 35 (2004) 159-171 HYPERLINK "http://sapo.incubadora.fapesp.br/portal" \n _blank Http://Sapo.Incubadora.Fapesp.Br/Portal HYPERLINK "http://sapo. incubadora.fapesp.br/portal" \n _blank

Stroke as the first manifestation of Fibromuscular Dysplasia – Case report

J. Macedo, S. Magalhães, H.R. Costa, A.P. Camelo
Physical and Rehabilitation Medicine Department, Centro Hospitalar do Porto, Hospital de Santo António

Introduction. Fibromuscular dysplasia (FMD) is a nonatherosclerotic noninflammatory angiopathy that affects medium and small size arteries predominantly in young women. It can affect vessels of any territory, being more common in kidneys (60-75%), cerebrovascular region (25-30%), visceral arteries (9%) and extremities (5%). In patients with identified cephalic FMD, 95% have internal carotid involvement and 12-43% have vertebral artery involvement. Most patients with craniocervical FMD are asymptomatic. The symptoms of stroke can be varied but most often involve the anterior circulation because of the predilection of FMD to affect the extracranial carotid arteries. From a neurologic perspective, FMD is an important cause of stroke in young adults. **Case Report.** We report a 22 years old woman diagnosed with FMD. In cerebral imaging studies were found bilateral ischemic lesions with an occlusive carotid stenosis and 50% of the basilar artery. In this context it was requested the collaboration of Physical and Rehabilitation Medicine (PRM). At the time of our observation the patient had dysarthria and tetraparesis with braquiofacial predominance. Patient underwent a rehabilitation program with an excellent evolution. **Conclusion.** No particular symptoms are pathognomonic for FMD, and any history compatible with a stroke in younger individuals may indicate underlying FMD. Because of the systemic nature of FMD, the general physical examination should include a search for signs of renal, visceral, and limb arterial involvement. Rehabilitation should include therapy that is directed at specific training of skills and at functional training. Therapy should be given with sufficient intensity to promote skill acquisition. The aims of rehabilitation are to minimize the impact of the disability resulting from the stroke and to optimize the quality of life.

References

1. Victor M, Ropper A. Adams & Victor's Principles Of Neurology. December 2000.
2. Braddom R. Physical Medicine and Rehabilitation. 3rd Edition.

Hemiparesis: Stroke or Conversion Disorder? Two case reports

J. Macedo, S. Magalhães, S. Toste, S. Amorim, A. Trêpa

Physical and Rehabilitation Medicine Department – Centro Hospitalar do Porto, Hospital de Santo António

Introduction. Conversion disorder (CD) is one of the differential diagnoses for certain neurologic disorders because it involves symptoms or deficits affecting voluntary motor or sensory function. After an exhaustive evaluation, that includes neurologic examination and laboratory and radiographic tests, no neurologic explanation exists for the symptoms, or the examination findings are inconsistent with the complaint. Unlike factitious disorders and malingering, the symptoms of conversion disorders are not intentional or under conscious control of the patient. The exact cause of CD is unknown, although researchers think the part of the brain that controls your muscles and senses may be involved. It may be the brain's way of coping with something that seems like a threat. The presentation is acute in onset and may follow a psychologically conflictual situation. A complete and comprehensive psychosocial history is of a vital importance. **Case Reports.** We report 2 cases of woman patients (with 36 and 46 years old) that were diagnosed with CD and referred for Physical and Rehabilitation Medicine consultation. They have hemiparesis and no alterations in the imagiologic exams. **Conclusion.** The diagnosis of CD is established by normal imagiologic exams and after Psychiatric evaluation. Clinical similarities between the disorders, unusual clinical presentations, comorbidity of neurologic and psychiatric disorders difficult the diagnosis. Physical therapy (PT) may be necessary and is often helpful in providing the patient a benign treatment to which they can respond and improve. PT may prevent complications of certain symptoms of conversion disorder. For example, regular movement of arms or legs may ward off muscle tightness and weakness.

References

1. Powsner S, Dufel S. Conversion Disorder. eMedicine May 1, 2009
2. Stonnington CM. Conversion disorder. American Journal of Psychiatry. 2006.
3. Conversion disorder. Moore & Jefferson: Handbook of Medical Psychiatry. 2nd ed. Philadelphia. 2004.

Urinary incontinence – Did pelvic muscles exercises do at home result?

J. Macedo, S. Magalhães, S. Amorim, A. Trêpa

Physical and Rehabilitation Medicine Department – Centro Hospitalar do Porto, Hospital de Santo António

Introduction. Urinary incontinence (UI) is defined by the International Continence Society Standardization Committee as “a condition in which involuntary loss of urine is a social or hygienic problem and is objectively demonstrable.” The different types of incontinence, excluding neurologic causes, are stress incontinence, urge incontinence and mixed incontinence. Successful treatment of urinary incontinence depends on the specific cause of incontinence.

In general, the first choice for treatment is the least invasive, with the least number of potential complications for the patient. The pelvic floor rehabilitation emphasizes strengthening the pelvic floor muscles that are critical in maintaining urinary continence. Pelvic muscle exercises may be used alone, reinforced with biofeedback therapy (BF), or enhanced with electrical stimulation (EE). **Materials and methods.** We consulted the medical files of patients that were referred for Physical and Rehabilitation Medicine observation diagnosed with IU and treated only with pelvic muscles exercises did at home, in a total of 48 patients. We collected retrospectively, demographic data and clinical history, with a complete characterization of the incontinence. It was elaborate a questionnaire and send it to patients address. The aim of this questionnaire is to know the success or not of pelvic muscles exercises taught in the consultation and did at home by the patient without BF or EE. **Results and conclusion.** At the time of elaboration of the abstract all questionnaires are not available. Exact results and respectively conclusions of our study will be exposed when they are presented in the Congress.

References

1. Nadir N, Silverberg M. Urinary Incontinence. emedicine. October 20, 2009.
2. Abrams P, Artibani W, Cardozo L, Khoury S, Wein A. Clinical Manual of Incontinence in Women. Health Publications 2005.

Spondylotic cervical myelopathy – Conservative versus Surgical treatment

M.J. Andrade, J. Macedo, S. Magalhães, M.M. Ribeiro

Spinal Cord Unit. Physical and Rehabilitation Medicine Department – Centro Hospitalar do Porto, Hospital de Santo António

Introduction. Spondylotic cervical myelopathy (SCM) is a chronic disease resulting from spinal cord compression, in the spinal canal. Such a compression causes clinical changes, fully or partially reversible. Best treatment practice is still a very controversial subject, namely whether to adopt a conservative or a surgical approach. While papers do not enlighten this dilemma, the authors have decided to review their own data. **Materials and methods.** The authors consulted clinical files of patients hospitalized in Physical and Rehabilitation Medicine Department with a diagnosis of MEC, between January 2005 and December 2009 and collected retrospectively, demographic data, number of days in the hospital, first symptoms, precipitating episode, level of injury, type of treatment, evolution and clinical outcome according to the ASIA criteria's. **Results.** Both sensitive and motor function did not present significant difference between surgical and conservative treatment. The significant finding, previously not published, relates to bladder function. The majority of patients undergoing surgical treatment recovered spontaneous voiding; on the other hand, most patients submitted to conservative treatment left the hospital with intermittent catheterisation. **Conclusion.** The most important finding of our work is that the recovery of a normal bladder function is far better when surgical treatment is performed; a higher percentage of patients leave the hospital with spontaneous micturition. We consider this a very important conclusion to support decision in favour of surgical treatment. One should not forget that normal bladder function minimizes the impact of the disability and optimizes the quality of life. Nevertheless, we believe further studies are needed to support this data.

References

- Predictive factors for spondylotic cervical myelopathy treated conservatively or surgically. Z. Kadanka et al. European Journal of Neurology 2005.

Does behcet's disease associate with neuropathic pain syndrome and impaired well-being?

S. Koldas Dogan¹, S. Ay¹, D. Evcik¹, N. Cuzdan¹, M. Guven², A. Gurler², A. Boyvat³

¹*Ufuk University, School of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkey*

²*Ufuk University, School of Medicine, Department of Dermatology, Ankara, Turkey*

³*Ankara University, School of Medicine, Department of Dermatology, Ankara, Turkey*

Introduction. Peripheral neuropathy signs have been reported in inflammatory chronic diseases but the presence of neuropathic pain syndrome (NPS) in Behcet's Disease (BD) is unclear. Since BD is a chronic and multisystemic disorder, it may can impact the patients' well-being and sleep quality. The aim of this study were to investigate 1) Does NPS associates with BD? and 2) BD associates impaired well-being? **Materials and methods.** Fifty eight patients diagnosed as BD (28 females, 30 males) with a mean age of 36.53±10.60 years, and 52 healthy controls (19 females, 33 males) with a mean age of 35.19±11.24 years were included. Sociodemographic characteristics were recorded. Pain severity was assessed by visual analogue scale (VAS) in rest and during activity. The neuropathic pain syndrome was diagnosed according to the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) index. The well-being and sleep disturbances of the groups were evaluated with Psychological General Well-Being (PGWB) Scale and Pittsburg Sleep Quality Index (PSQI). **Results.** The neuropathic pain syndrome was found in a ratio of 15.5 % in BD, and 0 % healthy controls. This result shows statistically significant difference (p=0.003). There were statistically significant increases in total PGWB and LANSS scores in patients with BD compared to healthy controls (p=0.000 and p=0.000, respectively). The total LANSS scores showed significant positive correlation with PSQI scores (r=0.322), and negative correlation with total PGWB scores (r=-0.672) in patients with BD. **Conclusion.** The NPS seems to be associated with BD which should be taken into consideration in patients with neuropathic signs. The QoL and quality of sleep of the patients with BD were found to be impaired and this may be due to the presence of NPS.

References

1. Akbulut L, Gur G, Bodur H, Alli N, Borman P. Peripheral neuropathy in Behcet disease: an electroneurophysiological study. Clin Rheumatol 2007; 26(8):1240-1244.

The effectiveness of ultrasound therapy in the treatment of carpal tunnel syndrome: randomised double-blinded placebo controlled study

S. Koldas Dogan, S. Ay, D. Evcik

Ufuk University, School of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Introduction. Carpal Tunnel Syndrome (CTS) is one of the most common entrapment neuropathy. Conservative and surgical treatment approaches have been used in the treatment of CTS. One of the conservative treatment methods is Ultrasound (US) therapy. The aim of this study was to investigate the effectiveness of US therapy in the treatment of CTS. **Materials and methods.** Thirty four patients with CTS diagnosed by electrophysiologic study were included in the study. The patients were randomly assigned to one of the two groups; Group I (20 patients) received US therapy (1 MHz, 1.5 Watt/cm², for 10 minutes) and Group II (14 patients) received placebo US therapy for 14 sessions in combination with splinting. Pain severity was assessed by visual analogue scale (VAS) and functional status were evaluated with hand grip strength test, pinch strength test and Boston symptom severity and functional capacity scales. **Results.** The mean ages of the patients were 52.13±12.27 years, and mean disease durations were 29.20±27.98 months. Significant improvements were recorded in both groups after the treatment in VAS (p=0.000 and p=0.006, respectively), bilaterally hand grip strength (right hand p=0.008 and p=0.017; left hand p=0.003 and p=0.034, respectively), right hand pinch strength (p=0.044 and p=0.046, respectively), Boston symptom severity (p=0.000 and p=0.007, respectively) and Boston functional capacity scales (p=0.001 and p=0.015, respectively). There was a significant increase in left hand pinch strength (p=0.003) in Group I but no significant increase was found in Group II (p=0.102). There were no significant differences between the groups in all parameters after the treatment (p>0.05). **Conclusion.** Ultrasound therapy has no superiority over placebo in patients with CTS.

References

- Oztas O, Turan B, Bora I, et al. Ultrasound therapy effect in carpal tunnel syndrome. *Arch Phys Med Rehabil* 1998;79:1540-44.

The effectiveness of low laser therapy in subacromial impingement syndrome: a randomized placebo controlled double-blind prospective study

S. Koldas Dogan, S. Ay, D. Evcik

Ufuk University, School of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Introduction. Low level laser therapy (LLLT) is widely used in various rheumatologic and musculoskeletal disorders. Conflicting results were reported about its effectiveness on musculoskeletal disorders. The aim of this study was to investigate the effectiveness of 850-nm gallium arsenide aluminum (Ga-As-Al) laser therapy on pain, range of motion (ROM) of shoulder joint and disability in subacromial impingement syndrome (SIS). **Materials and methods.** A total of 52 patients with a mean age of 53.59±11.34 years with SIS were included in the study. The patients were randomly assigned into two groups. Group I (n=30, laser group) and Group II (n=22, placebo laser group). Group I received laser therapy (3 joule/cm² at each point over maximum 5-6 painful points for 1 minute). Group 2 received placebo laser therapy. Cold pack therapy (10 minutes) was applied to all patients in both groups. Also patients were given an exercise program including range of motion, stretching and progressive resistive exercises. The therapy program were applied 5 times a week for 14 sessions. Pain severity was assessed by using visual analogue scale. Range of motion was measured by goniometer. Disability was evaluated by using Shoulder Pain and Disability Index (SPADI). **Results.** In group I, statistically significant improvements in pain severity, ROM except internal and external rotation and SPADI scores were observed compared to baseline scores after the therapy (p<0.05). In Group II, all parameters except ROM of external rotation were improved (p<0.05). However, no significant differences were recorded between the groups (p>0.05). **Conclusion.** In conclusion, LLLT seems to have no superiority over placebo laser therapy.

References

- Yeldan I, Cetin E, Ozdincler AR. The effectiveness of low-level laser therapy on shoulder function in subacromial impingement syndrome. *Disabil Rehabil* 2008;21:1-6.

The effectiveness of biofeedback assisted isometric exercises in knee osteoarthritis

S. Koldas Dogan, S. Ay, D. Evcik

Ufuk University, School of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Introduction. The aim of this study was to investigate the effectiveness of biofeedback assisted isometric exercise program on pain and functional status in knee osteoarthritis (OA). **Materials and methods.** Twenty seven patients with knee OA were included. The patients randomised into one of the two groups. Group I (n=15) received biofeedback assisted isometric exercise and Group II (n=12) received home exercise program included isometric exercises for quadriceps muscles. Exercises were applied 5 times/week for 3 weeks. Pain severity was assessed by visual analog scale (VAS) and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain scale, joint stiffness was evaluated with WOMAC stiffness score and functional status was assessed by time of 100 m walking test, time of ascending-descending stairs tests and WOMAC functional score before and after the treatment. **Results.** No significant differences were detected regarding sociodemographic characteristics, pain severity and functional status between the groups before and after the treatment (p>0.05). In Group I, significant improvements were found after treatment in all parameters (p<0.05). In Group II, significant improvements were observed in pain severity, time of 100 m walking test, WOMAC pain and functional score (p<0.05) while no significant improvement were recorded in time of ascending-descending stairs tests and WOMAC stiffness score (p>0.05). **Conclusion.** This study shows that biofeedback assisted isometric exercise was effective on pain severity and functional status in knee OA.

References

- Durmuş D, Alaylı G, Cantürk F. Effects of quadriceps electrical stimulation program on clinical parameters in the patients with knee osteoarthritis. *Clin Rheumatol*. 2007 May;26(5):674-8.

The neuropathic pain syndrome and sleep quality in osteoarthritis

S. Koldas Dogan, S. Ay, D. Evcik

Ufuk University, School of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Introduction. The aims of this study were to investigate the prevalence of neuropathic pain syndrome (NPS) in osteoarthritis (OA) and to assess the quality of life and sleep quality in OA. **Materials and methods.** Thirty eight patients with OA (20 females, 18 males) with a mean age of 56.68±13.27 years and 52 healthy controls (19 females, 33 males) with a mean age of 35.19±11.24 years were included in the study. Pain severity at rest and during activity was evaluated with visual analogue scale (VAS). The NPS was diagnosed by the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) index. The quality of life and sleep quality was assessed by Psychological General Well-Being (PGWB) Scale and Pittsburgh Sleep Quality Index (PSQI). **Results.** The prevalence of NPS was 10.5 % in OA while 0 % in healthy controls. This result was statistically significant (p=0.017). The decreased total PGWB scores and increased LANSS and PSQI scores were found in OA compared with healthy controls (p=0.001, p=0.000 and p=0.000, respectively). **Conclusion.** The prevalence of NPS was found to be increased and sleep quality was impaired in OA compared to health controls.

References

- Martin S, Chandran A, Zografos L, Zlateva G. Evaluation of the impact of fibromyalgia on patients' sleep and the content validity of two sleep scales. *Health Qual Life Outcomes*. 2009 Jul 10;7:64.

Efficacy of Clodronate in Complex Regional Pain Syndrome (Shoulder-Hand Syndrome) post stroke

A. Tuzzi¹, C. Baiano², A. Romeo², M. Chierchia³, G.R. Schirò⁴, R. Russo⁵

¹U.O.C. *Recupero e Rieducazione Funzionale. Centro di Riabilitazione di Campiglia Marittima- ASL 6- Livorno*

²U.O.C. *Medicina Fisica e Riabilitazione - P.O. A. Rizza - Azienda Sanitaria Provinciale di Siracusa*

³Dipartimento di Scienze Ortopediche, Traumatologiche, Riabilitative e Plastico Ricostruttive- Servizio di Chirurgia dell'Osteoporosi-Seconda Università degli Studi di Napoli

⁴Università Cattolica del Sacro Cuore - Roma

⁵C.G.M. San Luca, Battipaglia (Salerno)

Introduction. CRPS of the upper arm after stroke is still frequently known as shoulder-hand syndrome (SHS). The syndrome is believed to be a clinical form of algodystrophy and it was considered to develop in three consecutive phases: I, acute; II, dystrophic; and III, atrophic. The aim of this study was to assess the effectiveness of the of bisphosphonate Clodronate in CRPS-SHS post stroke. **Materials and methods.** We selected 42 patients who had been suffering from the disease for no less than one month. We used a randomised method to form two groups, a Clodronate group and a Control group, of 21 people each. The Clodronate group received neuromotor rehabilitation and was treated with intramuscular administration of 100 mg daily of disodium clodronate for 30 days. After this period, an intramuscular administration of 100 mg weekly of disodium clodronate was performed for 6 months. The Control group underwent neuromotor rehabilitation only. Outcome measures were visual analogic scale (VAS), administered to assess the intensity of pain; range of motion (ROM) and motor function of the affected upper limb were also assessed; disability by Functional Independence Measure (FIM). All assessments were performed at baseline and after 3, 6, 12 and 18 months. Paired data analysis was carried out in each group specifically, each follow-up was compared with the previous one using the paired T test; the Mann Whitney test was used for comparison between groups. **Results.** We reported in the Clodronate group a great improvement of pain of the affected upper limb, also ROM improved. No differences were assessed for motor function and disability. **Conclusion.** The treatment with Clodronate was easily manageable and well tolerated; it guaranteed an increase of the ROM and a reduction of the VAS

References

1. Santamato A, Ranieri M, Panza F, Solfrizzi V, Frisardi V, Stofa I, Megna M, Fiore P. Role of Bisphosphonates and Lymphatic Drainage Type Leduc in the Complex Regional Pain Syndrome (Shoulder-Hand Syndrome). *Pain Med* Jan 2009; 10(1):179-85
2. Pertoldi S, Di Benedetto P. Shoulder hand syndrome after stroke. *Eur Medicophys* 2005;41:283-92.
3. Zyluk A, Zyluk B. Shoulder-hand syndrome in patients after stroke. *Neuro Neurochir Pol* 1999; 33:131-42.
4. Varenna M, Zucchi F, Ghiringhelli D, et al. Intravenous clodronate in the treatment of reflex sympathetic dystrophy syndrome. A randomized, double blind, placebo controlled study. *J Rheumatol* 2000; 27:1477-83.

Chronic low back pain after conservative treatment of lumbar disc herniation

E. Nikolik-Dimitrova

Institute of Physical Medicine and Rehabilitation, Skopje, Macedonia

Aim of the study. Is to assess the frequency of chronic low back pain (CLBP) after conservative treatment of lumbar disc herniation, factors that influence of its appearance and its impact on long-term outcome. **Materials and methods.** A group of 70 patients (49 men and 21 women, average age 44.2 years) had received physical therapy treatment for lumbar radiculopathy due to lumbar disc herniation. The patients' assessments were made at admission, at discharge and at follow up (an average 2 years) after treatment. For outcome assessment Japanese Orthopedic Association Score Scale was used. For statistical analysis Wilcoxon matched pairs test, Mann-Whitney test, Kolmogorov-Smirnov two- sample test and Fisher exact test. **Results.** After conservative treatment of lumbar radiculopathy patients had very good outcome, with reduced lumbar and radicular pain, better clinical findings and some relief in activities of daily living. Two years later, 10 patients (14.3%) had CLBP. There wasn't any differences in the educational level, profession and smoking habits in the groups of patients with or without CLBP. Patients with CLBP had worse long-term outcome ($p < 0.05$), more often took medicines - most often NSAID ($p < 0.01$), and had some socio-economic problems ($p < 0.0001$). **Conclusion.** After conservative treatment of patients with lumbar disc herniation, some of the patients may develop CLBP and their long term outcome is worse. It is very important to make more comprehensive evaluation and interdisciplinary individualized therapy programme to prevent chronic low back pain.

References

1. Adams N., Taylor D. Psychological models of chronic pain. In *The psychophysiology of low back pain*, Eds. Adams N. et al., Churchill Livingstone, New York, 69-96, 1997.
2. Bloodworth D, Calvillo O, Smith K, Grabois M. Chronic pain syndromes: evaluation and treatment, In *Physical medicine and rehabilitation*, second edition, Eds. Braddom R.L., W.B.Saunders Company, Philadelphia, 913-933, 2000.
3. Cox JM. Care of the intervertebral disc patient. In *Low back pain. Mechanism, diagnosis, and treatment*. Sixth edition. Ed. Cox J.M., Williams &Wilkins, Baltimore, 527-589,1999.

Dopaminergic vs. GABAergic modulation of human motor cortex plasticity – a transcranial magnetic stimulation study

N.V. Ilic¹, E. Dubljanin-Raspopovic¹, S. Varagic-Markovic¹, U. Nedeljkovic¹, N. Krstic¹, S. Tomanovic¹, V. Vesovic-Potic¹, T.V. Ilic²

¹*Clinic for rehabilitation, Clinical Center of Serbia, Belgrade, Serbia*
²*Department Clin Neurophysiol, Military Medical Academy, Belgrade, Serbia*

Introduction. The dynamic and distributed network of motor representations maintain the capability of plastic change throughout life. Most likely, this serves as the substrate for processes such as motor learning or motor reorganisation after lesion. Monoamines as dopamine and GABA demonstrated powerful modulation of motor cortex plasticity in animal and human experiments (Ziemann et al, 2006). **Materials and methods.** The present study aimed at testing the effects of the levodopa (LD) and GABA-ergic agonist diazepam (DZP) on various parameters of cortical excitability measured with TMS, as well as associative LTP-like plasticity (Stefan et al. 2000) in twelve healthy human subjects, using non-invasive method transcranial magnetic stimulation (TMS). The effects of a single oral dose of two drugs (100 mg levodopa + 25 mg benzeraide; 10 mg diazepam) was tested in a double-blind placebo-controlled study design. Each subject was tested for each drug in a pseudo-randomised order. Minimum delay between sessions was one week. **Results.** Drugs have shown a significant effects on associative LTP-like plasticity (ANOVA for repeated measures, $p < 0.0001$). Post hoc comparisons between each drug and placebo showed that DZ led to a significant decrease of associative LTP-like plasticity. In contrast, LD has resulted in significant increase of associative LTP-like plasticity. **Conclusion.** These findings support anecdotal clinical findings that dopamine promotes plasticity in human cortex, whereas potentiation of GABAergic transmission is potentially detrimental. This modulation of plasticity may be utilised in process of rehabilitation after brain lesion.

References

- Stefan K, Kunesch E, et al. Induction of plasticity in the human motor cortex by paired associativ stimulation. *Brain* . 2000; 123: 572-584.
- Ziemann U, Meintzschel F, Korchounov A, Ilic TV. Pharmacological modulation of plasticity in the human motor cortex. *Neurorehabil Neural Repair*. 2006 Jun;20(2):243-51.

Correlation between muscle thickness and muscle strength – a new method to measure muscle strength using musculoskeletal ultrasound?

E.M. Strasser, T. Draskovits, E. Grundböck, M. Quittan

Institute of Physical Medicine and Rehabilitation – Karl Landsteiner Institute of Remobilisation and Functional Health, Social Medical Centre South, Vienna, Austria

Introduction. Skeletal muscle strength is an important parameter to follow improvements during strength exercise. However, many patients are physically or mentally not able to perform muscle strength test. Therefore, objective parameters describing muscle strength would be important for clinical practice. Recent publications indicate musculoskeletal ultrasound is an inexpensive device to evaluate parameters as muscle thickness, pennation angle and echogenicity. However, there is no clinical study evaluating which parameter correlates best with muscle strength. Therefore this study was conducted to investigate the correlation of ultrasonographic parameters of m. quadriceps femoris with isometric muscle strength. Moreover the reproducibility of the method was determined. **Material and methods.** This prospective, randomized and observer blind study consisted of a young group (18 – 35 years) and an old group (60-80 years). For every group 13 healthy men and women without prosthesis, pain, neuromuscular or chronic diseases were recruited. Every examination consisted of ultrasonographic measurements of muscle thickness, pennation angle and echogenicity of rectus femoris, intermedius, vastus lateralis and vastus medialis. Ultrasound was performed two times by two observers. Additionally maximum isometric muscle strength, handgrip strength, anthropometric data and overall physical activity was assessed. Each patient was examined on two separate days within two weeks. Ultrasonographic parameters were evaluated using ImageJ software (National Institutes of Health). **Results.** Preliminary data of the young group revealed strong and significant correlations between muscle strength and muscle thickness for every part of m. quadriceps femoris ($r = 0.77-0.88$, $p < 0.0001$). Correlations between pennation

angle, echogenicity and muscle strength were weaker and ranged from $r=0.45$ to 0.66 ($p<0.001$) and $0.45 - 0.59$ ($p<0.001$), respectively. **Conclusion.** Preliminary data revealed a strong and significant correlation between isometric muscle strength and muscle thickness. Therefore ultrasound could be at least for young patients an inexpensive and easy to apply bedside method to assess therapeutic changes in muscle strength.

Effectiveness of teriparatide in osteoporotic women

S. López-F, P. Peret, E. Barnola
Barcelona, Hospital Vall d'Hebron

Vertebral fracture is the most common injury due to osteoporosis. It generates an important impact on both social and personal aspects. Of all drug therapies, teriparatide studies provide evidence of significant increase in bone mineral density and the effectiveness of reducing the rate of fractures. **Objectives.** The aim of the study is tracking a group of osteoporotic patients: Women, Caucasian, postmenopausal, aged between 55-70 years with and without previous vertebral fracture and to evaluate the evolution of their disease after treatment with teriparatide. **Material and methods.** Criteria for inclusion / exclusion are established. Blood tests were performed pretreatment and at 3, 6 and 12 months after treatment with teriparatide. We compared the bone mass gain in the 3 years previous to starting the drug therapy and in the subsequent 3 years. Potential adverse effects are reviewed. Risk factors for new fractures are analyzed. **Conclusion.** Teriparatide is an optimal treatment for postmenopausal osteoporosis. The patients experience a significant increase in BMD and there is no verified incidences of new fractures. No laboratory abnormalities or relevant side effects have been demonstrated.

References

Bone Mineral Density Thresholds for Pharmacological Intervention to Prevent Fractures. Ethel S. and col. *Arch Intern Med.* 2004; 164: 1108-1112.
 Osteoporosis Prevention, Diagnosis, and Therapy. NIH Consensus Development Panel on Osteoporosis Prevention, Diagnosis and Therapy. *Jama*, February 14, 2001-Vol 285, nº 6.
 Clinical practice guidelines: for the diagnosis and management of osteoporosis in Canada. / Prevention and treatment UMHS 2005 / OMC 2008

Improvement walking in chronic stroke patients with a dropped foot after functional electric stimulation

V. Santoro, J. Grasso, S. Moretti, B. Lombardi
Functional recovery and rehabilitation unit Hospital Misericordia e dolce USL 4 Prato, Tuscany, Italy

Introduction. We treated 3 young patients with chronic hemorrhagic stroke with dropped foot with electrical stimulation in combination with standard physiotherapy with good benefits, we want to find out how long the benefit lasts. **Materials and methods.** We treated 3 (2 female, 1 male; median age 41 years) patients with hemiplegia and dropped foot from chronic hemorrhagic stroke (at least one year from acute event) with electrical stimulation applied to the peroneal nerve in combination with neuromotor physiotherapy for 3 months twice a week. We valuated range of motion, spasticity measured with Ashworth scale (1) and a functional measure as 6 minutes walking test (2) at the beginning of treatment at the end and after 30 and 60 days. **Results.** Every patients had benefits after 3 months from electrical stimulation with a gain in range of motion of 15 degrees in media, spasticity improving 1-2 points in Ashworth scale, speed of walking and 6 MWT of 37% in media without the functional stimulation. A new valuation was performed after 30 and 60 days without functional stimulation and we have found that benefits of treatment was remained the same. **Conclusion.** In our project patient improve their gait capacity and the benefits of treatment still remain after 30 and 60 days. Need more patients and more controlled study to confirm it.

References

1. Ashworth B: Preliminary trial of carisoprodol in multiple sclerosis. *Practitioner* 192:540-542, 1964.
 2. ATS Statement: Guidelines for the Six- Minute Walk test, *Am J Respir Crit Care Med*, 2002.

Efficacy of ultrasound guided Botulinum Toxin (BT) injection for the treatment of hip flexor spasticity in spinal cord injured (SCI) patient - Case study

N. Barotsis¹, D. Psillaki¹, V. Tragoulias¹, T. Georgiadis¹, C. Gartzios¹, N. Groumas, P. Kosmidis², M. Domazou², K. Kalokairinou², P. Papadaki²
¹1st PRM department
²Radiology department, National Rehabilitation Centre, Athens, Greece.
¹1st PRM Department, National Rehabilitation Centre, Athens, Greece

Introduction. Hip flexor spasticity may severely impair ambulation in SCI patients. Sonographic guidance of BT injection seems to be advantageous for treating hip flexor spasticity, allowing direct visualization of target muscles. Due to the depth of the injection site and its proximity to neurovascular bundle, commonly used methods such as palpation, electrostimulation and electromyographic recording, present significant difficulties for guiding proximal hip muscle injection. **Materials and methods.** A 32 year old female suffering from T10 complete paraplegia, was admitted in our rehabilitation centre 9 months after SCI. She presented severe spasticity of hip adductors on both limbs and unilateral hip flexor spasticity, significantly interfering with gait and personal hygiene. The patient started gait training in parallel bars, using walkabout orthosis. Excessive hip flexion during swing phase, caused by hip flexor spasm, made ambulation impossible. The patient was complaining of frequent spasms of hip flexors, elicited by minor tactile stimuli, even at rest. After exclusion of eventual spasticity provoking factors, oral baclofen (up to 60 mg/d) was administered, but failed to control spasticity and improve functional status. In addition to her regular stretching program, Iliacus muscle was injected with 250 Dysport units under direct ultrasound imaging, Rectus Femoris with 150 units and Adductors with 300 Dysport units for each limb. **Results.** 14 days after BT treatment the patient reported 80% reduction in the frequency of hip flexor spasm. She was able to walk in parallel bars using reciprocating gait orthosis, without any help from the therapist. **Conclusion.** Ultrasound guidance for BT injection allows the precise treatment of spastic muscle groups, minimizing required dose, the discomfort of the patient and the risk of trauma to neurovascular structures. The technique is simple and could be recommended for deep proximal muscles, particularly in patients who cannot tolerate motor point electrical stimulation.

Neurophysiological evaluation of respiratory disorders in Chronic Inflammatory Demyelinating Polyradiculoneuropathy (CIDP) – case study

N. Barotsis, D. Psillaki, N. Ananidis, S. Papakosta, G. Stamatakis, N. Groumas
¹1st PRM department, National Rehabilitation Centre, Athens, Greece.

Introduction. It is known that CIDP may affect the Phrenic nerve, resulting in various degrees of respiratory dysfunction. Phrenic nerve involvement can be evaluated by electrophysiological investigations. **Materials and methods.** A 59 year old female patient, presenting lower limb weakness and difficulties with ambulation was admitted in neurology department 18 months after the appearance of first symptoms. CIDP was diagnosed and the patient was treated with corticosteroids. She was referred to our department for rehabilitation. Six months later, despite the initial improvement, she became unable to ambulate. Muscle weakness progressed to upper limbs and trunk with accompanying respiratory impairment. **Results.** The patient underwent electrophysiological examination of upper & lower limbs, cranial nerves and conduction study of Phrenic nerves, according to the method described by Bolton et al. The examination revealed demyelinating & axonal disorder of upper and lower limb nerves. Cranial nerves and facial muscles were not affected. Prolonged latency of Phrenic nerve compound muscle action potential (CMAP) was documented, with low CMAP amplitude bilaterally, indicating severe nerve involvement, particularly on right side (distant latency right = 12,3msec, left =9msec, normal value <8,1msec & CMAP amplitude right = 0,1mV, left 0,2mV, normal value >0,3mV). Two weeks later the patient presented respiratory insufficiency requiring mechanical ventilation, despite treatment with corticosteroids and intravenous administration of immunoglobulin. **Conclusion.** Electrophysiological investigation of phrenic nerve is an examination without particular technical difficulties. It represents an important method for the quantitative assessment of neurogenic impairment of respiratory function, allowing us to guide and adapt

the rehabilitation program in patients suffering from CIDP. Further study is required in order to investigate its prognostic value.

References

Bolton, C.F. & Zifko, U. (2003) Clinical neurophysiology of respiration. In Stalberg, E. (ed) Handbook of Clinical Neurophysiology, Volume 2 - Clinical Neurophysiology of Disorders of Muscle, Elsevier, pp 359-388.

Are intrathecal baclofen (ITB) trials performed with an in-situ catheter either by continuous infusion or multiple boluses in a rehabilitation ward setting safe and effective?

B.S. Mayilvaganan, M. Cirasanambati, J. Matthews, A.K. Ball, A.B. Ward
University Hospital of North Staffordshire NHS Trust, UK

Aim. To determine the safety and efficacy of using an intrathecal catheterization technique for ITB trials. **Background.** Performing ITB trials before implantation of a programmable pump is a well established practice. This can either be done by lumbar puncture and bolus, multiple lumbar punctures with multiple boluses or intrathecal catheterization followed by multiple boluses or an infusion. Most of the latter are carried out in an operating room, but some are done in a ward setting, if a catheter is not used. Common complications seen with these test-dose are nausea, vomiting, headache and sedation, which differ from those drug-related side effects of regular ITB therapy, which include drowsiness, dizziness, constipation, and muscular hypotonia. **Materials and methods.** 71 patients underwent ITB trials in our center. Of these, 70 went on to ITB pump implantation. In the majority of trials, an intrathecal catheter was placed in situ for up to 72 hours and either sequential boluses or a continuous infusion of Baclofen were given during assessments for spasticity, transfers and mobility. These trials have been retrospectively studied for their procedural safety, methodology and outcome. **Results.** None of the trials produced any serious complications and patients were managed effectively in a ward setting. The procedure was found to be simple to carry out on the ward and patient experiences were more satisfying than going to the operating room. Trial assessments could be scheduled quickly and the programme allowed patients to be processed more quickly, thus reducing the time for assessment. **Conclusion.** Carrying out catheter infusions in ITB trials in a rehabilitation ward setting was deemed to be safe and effective, as shown through the findings of this audit.

Effectiveness of Motor Imagery Training integrated with a rehabilitation strategy in Parkinson's disease

G. Censi¹, V. Battistelli¹, S. Castelli¹, M. Guidi², O. Mercante¹

¹Rehabilitation Unit

²Neurology Unit INRCA – National Institute for Hospitalization and Care Scientific Ancona (Italy)

Introduction. Parkinson's disease (PD) is a progressive degenerative illness where, especially in the late course, patients experience chronic motor impairments and limitations in activities of daily living. Mental training has been yet used to rehabilitate motor deficits in a variety of neurological disorders. Our aim was to assess the therapeutic benefits of MIT in PD patients. **Materials and methods.** We divided two groups of PD patients, the 1st one (15 people) underwent a classic rehabilitation therapy associated with MIT and the 2nd (15 people) only the classic. The classic consisted in 3 rehabilitation sessions (60 min each) a week, focused to improve balance, postural control and gait. In the MIT session, for only the 1st group, the patients were asked to mentally simulate a purposeful given action or a day living situation. Patients were evaluated at the beginning of the therapy and after 8 months of rehabilitation by using UPDRS and PDQ39. **Results.** The UPDRS sections of Motor Abilities, Activity of Daily Living and Cognitive and the score of PDQ39 resulted improved at the end of the treatment in both groups, but the first one obtained better results on all UPDRS sections. Significant improvements were observed in Mobility, Self-efficacy and participation. **Conclusion.** According to our results we can assess that the association of MIT with a rehabilitation program can enhance the motor recovery and the quality of life of PD patients more than a traditional approach. We also noticed improvements of emotional well being, mental abilities and behaviour of these patients.

References

1. Rizzolatti G., Craighero L. (2004) The mirror neuron system". In Annual Reviews of Neuroscience, 27, 169-192.
2. F. de Lange, K. Roelofs, I. Toni Motor imagery: A window into the mechanisms and alterations of the motor system. Cortex, Volume 44, Issue 5, Pages 494-506.

Longterm efficacy of prolonged integrated rehabilitation therapy in pd patients

M. Guidi², S. Castelli¹, V. Battistelli¹, G. Censi¹, O. Mercante¹

¹Rehabilitation Unit

²Neurology Unit INRCA, National Institute for Hospitalization and Care Scientific Ancona (Italy)

Introduction. In our previous experience we demonstrated how an integrated therapy in PD patients improves motor disability tested with UPDRS, PDQ39 and Freezing of Gait Questionnaire. PD is a progressive illness characterized by motor and non-motor symptoms, which can ameliorate by an appropriated therapy aimed to claw back postural control, gait and balance, but it is known that classic rehabilitation therapy may bring an ephemeral recovery. Our aim was to find out how a different modality and duration of rehabilitation therapy can influence the course of the illness. **Materials and methods.** In this study we evaluated the same patients who persisted with rehabilitation in the last three years by using the same clinical tests (UPDRS, PDQ39). Three sessions a week (60 minutes each) of an integrated therapy, based on music and dance, were performed. **Results.** The UPDRS and PDQ 39 were aggravated at the start of the therapy according to the progressive nature of the illness. After eight months of rehabilitation, as happened three years before, they had a statistical significance improvement in the motor section of UPDRS and in PDQ39. **Conclusion.** If we consider the illness progression and looking our results, we can affirm that a continuous rehabilitation program performed for eight months every year can improve motor disability and presumably slowness the course of the disease

References

1. Schrag A, Dodel R et al, Rate of clinical progression in Parkinson's disease: a prospective study. Movement Disorders 2007.
2. Guidi M, Censi G. Musicoterapia, biodanza, danzaterapia integrata. Atti del VI Convegno Nazionale di Parkinson Italia, 2006.

Comparative study of the external compartment knee osteoarthritis treatment: with isokinetic/isometric dynamometric system Vs traditional kinesitherapy

G.G. Ghetti, O. Mercante, R. Ansevini, V. Bombace, F. D'Ambrosio, A. Fiè, L. Costantini

Intensive Rehabilitation Unit, I.N.R.C.A. Ancona, Italy.

Introduction. The various rotula affections are frequently responsible of knee painful syndromes. Between the several causes of patellofemoral pain, the more frequent one is the knee extensor apparatus deviation. The syndromes due to knee extensor apparatus deviation can be associate to ritual subluxation and chondromalacia, but often the only symptom is pain. Objective of the study is find the more suitable modality of rehabilitative treatment for the patellofemoral pathology. **Materials and methods.** Were included 30 subject of both sexes between the 18 and 65 years, with confirmed diagnosis of patellofemoral syndrome with defined external compartment knee osteoarthritis (clinical diagnosis + knee tangential x-ray). To all subjects were preliminary administered clinician and instrumental (isokinetic) tests. The subjects were randomly divided in two groups of 15 units with two different modalities of treatment: with isokinetic/isometric dynamometric system Vs traditional manual and active assisted kinesitherapy. **Results.** Preliminary data suggest that both the treatment seem to be equivalent in efficacy at the condition of correct administration of exercises, following the subsequent rules: a) accuracy in specific activation of the vastus medialis obliquus muscle in absence of articular compression (0°-30°); b) light workload at low frequency; c) exercises prolonged in the time to prevent the recidivisms, favourites from the district morphologic alterations. **Conclusion.**

Also if the data doesn't show clinical differences between the two different treatments, we suggest that the isokinetic/isometric dynamometric system is surely more accurate to assure the correct workload and frequency of exercises.

References

1. Ferret J.M.: Syndrome rotulien et isocnetisme. International Association Laser Therapy. Bergamo, 11 Novembre 2006.
2. Mizuno Y, Kumagai M, Mattessich SM, Elias JJ, Ramrattan N, Cosgarea AJ, Chao EY.: Q-angle influences tibiofemoral and patellofemoral kinematics. J Orthop Res.19(5):834-40, 2001.

Correlations between ICF Stroke Brief Core Set items and other clinical evaluations in patients with ictus cerebri

O. Mercante, V.G. Bombace, F. D'Ambrosio, A. Fiè
Intensive Rehabilitation Unit, I.N.R.C.A. Ancona, Italy.

Introduction. The ICF Core Sets, in particularly the Brief form, represent the more useful set of ICF. We usually apply the Brief ICF Core Set for Stroke in the daily clinical activity in our Intensive Rehabilitation Unit. **Materials and methods.** In our study were included 26 subjects, 17 females and 9 males, between the 51 and 98 years with mean age of 80.53 years with diagnosis of ictus cerebri. At admission and at discharge all subjects were valued with FIM scale plus specific scales dependents of their disabilities. At discharge we applied the Brief ICF Core Set for Stroke to all subjects, and we compared the items between them and with the FIM score at admission and discharge, the age and the lasting of hospitalization, using a correlation statistic. **Results.** The mean FIM score at admission was 59,15 points, at hospital discharge 80,23 points with a mean FIM gain of 21,08 points. The mean lasting of hospitalization was 38,03 days. The statistics showed a mild correlations between b730 and days of hospitalization, b114 and FIM at discharge, b730 and capacity of d450, a stronger correlation between b167 and d330. **Conclusion.** These preliminary data show a correlation between b730 (Muscle power functions) and lasting of hospitalization, b114 (Orientation functions) and FIM at discharge, d450 (Walking) and b730 (Muscle power functions) and a stronger correlation between b167 (Mental functions of language) and both performance e capacity of d330 (Speaking). Although some of these correlations are quite assumed, further studies are necessary to establish clinical significant correlations.

References

- Geyh S, Cieza A, Schouten J, Dickson H, Frommelt P, Omar Z, Ring H, Kostanjsek N, Stucki G. ICF Core Sets for stroke. *J Rehab Med* 2004;(44 Suppl):135-41.

Analysis of the quality of life by Womac scale in the treatment of knee osteoarthritis with intraarticular hyaluronic acid

M.V. Lourido Estévez, C. Fernández Caamaño, R. Fiorillo, J. Flores Calvete, L. Rey Pita, M. Barberá Loustaunau
Rehabilitation Service, Complejo Hospitalario de Pontevedra. Pontevedra. Spain

Introduction. In patients with knee osteoarthritis there is a decrease of hyaluronic acid (HA) intraarticular, it may be the cause of pain and functional disability associated with this pathology. Currently being used often HA infiltration to decrease these symptoms. The aim of this study was to evaluate the results obtained in patients with knee osteoarthritis in different degrees of development after intraarticular treatment with HA. **Materials and methods.** The sample consists of 19 patients in whom radiological study was performed to group them according to the classification of Kellgren and Lawrence, having in our sample 10 patients in grade II and 9 in grade III. The treatment consisted of a single intraarticular injection of 60 mg HA. Western Ontario McMaster Universities Osteoarthritis (WOMAC) scale was used for the assessment of pain, stiffness and functional ability, collecting the results of this scale one week before treatment and after treatment with a range of 1-9 months. Results are analyzed with the statistical program SPSS, using the test not parametric of Wilcoxon. **Results.** We obtained a statistically significant decrease of the mean test values before and after treatment and this difference was greater in patients with knee osteoarthritis grade II Kellgren and Lawrence. **Conclusion.** Despite the small sample size, taking into account the results obtained, we could conclude that the treatment had a positive impact on quality of life of patients with knee osteoarthritis. We recommend further studies in order to assess the significance of the application of HA in the treatment of knee osteoarthritis

References

- Bellamy N, Buchanan WW, Goldsmith CH, Campbell J, Stitt LW. Validation study of WOMAC: a health status instrument for measuring clinically important patient relevant outcomes to antirheumatic drug therapy in patients with osteoarthritis of the hip or knee. *J Rheumatol.* 1988a;15(12):1833-1840.
- Intra-articular therapy in osteoarthritis. I Uthman, J-P Raynaud, B Haraoui. *Postgrad Med J* 2003;79:449-453.

Acute Spinal Cord Injury and Framingham

Leire Ortiz Fernández, Ruben Natividad Andres, Nora Cívicos Sánchez, M^a Luisa Jauregui Abrisqueta, Amaia Madariaga Zabala, M^a Paz Abaitua Ezquerro, Ander Alava Menica, Teresa Torralba Puebla.
Hospital de Cruces, Barakaldo, Spain.

Introduction. To study risk factors for cardiovascular disease (RF) in individuals with acute spinal cord injury (SCI), to estimate the cardiovascular risk (CVR) in 10 years according to Framingham Heart Study (FS). **Materials and methods.** Retrospective study of RF in acute SCI admitted to our Hospital (2008-2009). We estimated CVR on admission and discharge. We studied age of onset of SCI, etiology, functional injury, physical activity, pharmacological treatment of RF and development of cardiovascular disease (CVD). **Results.** 53 patients (male:female = 39:14). Mean age: 56.26 years (23-83). Medical records: hypertension (22), diabetes mellitus (8), hyperlipidemia (11), obesity (17), sedentarism (13), nicotine poisoning (20), excessive alcohol consumption (19). 24 used pharmacological prophylaxis on admission whereas 22 needed it at discharge. Etiology: medical (22), traumatic SCI (31). Functional injury: 11 complete tetraplegia, 14 incomplete tetraplegia, 8 complete paraplegia, 11 incomplete paraplegia, 9 cauda equina syndrome. Mean increase of 11.95 mg/dL in serum of total cholesterol level and 5.54 mg / dL of high-density lipoprotein cholesterol level. At discharge, 21 were "physically very inactive", 23 "inactive" and 9 "active". On the follow up, 5 suffered from vascular disease, 7 died owing to other causes. CVR according to FS after SCI onset was 0.245283 point higher at discharge. **Conclusion.** In our series, there was no reduction of serum lipid level, deaths due to CVD or arrhythmias in the first year after SCI onset. These results did not coincide with the reviewed literature. At discharge, 3.7% less of the patients received prophylaxis of any RF; there was an increase of 0.245283 point of FS. Based on our experience, we believe it should be measured the increased risk of suffering from CVD after SCI onset and the correct use of prophylactic measures.

References

- Barman WA, Spungen AM; Coronary Heart Disease in Individuals with Spinal Cord Injury: assessment of risk factors, [review] *Spinal Cord.* 46 (7):466-76, Jul 2008.
- Myers J, Lee M, Kiratli J: Cardiovascular disease in spinal cord injury. An overview of prevalence, risk, evaluation, and management. *Am J Phys Med Rehabil* 2007;86:142-152.

Reliability and validity of the turkish version of the short physical performance battery

S. Yucel Dalgic, B. Doğu, F. Sahin, T. Eralik, B. Kuran, S. Gursakal
Sisli Etfal Education and Research Hospital, Physical Medicine and Rehabilitation, Uludag University, Faculty of Economics and Administrative Sciences, Department of Econometrics

Introduction. The purpose of this study was to evaluate the reliability and validity of the Turkish version of the Short Physical Performance Battery (SPPB) scale by which balance and performance of the lower extremity in elderly people are assessed. **Materials and methods.** Eighty volunteers ≥ 65 years of age were included in the study. Individuals wearing lower extremity prosthesis or orthosis, lower extremity amputees, those who have experienced orthopedic surgery within the last 6 weeks, wheelchair-bound or bedridden patients, those mentally unable to obey directives (people with dementia, and Alzheimer's disease) were excluded from the study. Following translation, the Turkish version of the scale was administered to each participant twice with an interval of 2 weeks. The intraclass correlation coefficient (ICC) was calculated to assess intra- and inter-observer reliability. Cronbach α was calculated to evaluate internal consistency of the total SPPB score. ICC was calculated to examine test-retest reliability. Convergent validity was assessed by correlating the scale with Berg Balance Scale (BBS) and Timed Up&Go Test (TUG). **Results.** Eighty participants consisted of 64 female, and 16 male patients. The mean age was 76.5 \pm 6.75 years. Cronbach α of the Turkish version of the SPPB was 0,741. The ICC for intra- and inter-observer reliability was 0,94 and 0,86 ($p < 0,001$), respectively. The test-retest reliability (ICC) for the total score was 0.92, and ranged from 0,88-0,95 for individual items. In terms of validity, the Turkish version of the SPPB correlated directly with the BBS and indirectly with TUG ($r = 0,77$ $p < 0,001$; $r = -0,75$ $p < 0,001$, respectively). **Conclusion.** The Turkish version of the SPPB is a reliable and valid scale to be used in the assessment of balance and lower extremity function of the elderly Turkish population.

Agreement in rating of pain intensity and overall well-being between parents and children with juvenile idiopathic arthritis

N. Djurovic¹, G. Susic¹, R. Stojanovic¹, I. Petronic², M. Terek¹, S. Pavlov¹

¹Institute of Rheumatology, Belgrade, Serbia

²University Childrens Hospital, Belgrade, Serbia

Introduction. Pain is one of the major problems in children with juvenile idiopathic arthritis (JIA)(1). Aim of the study was to investigate the agreement between parents and children in rating pain intensity and child's overall well-being, and correlate these parameters and disease activity indicators. **Materials and methods.** The study included 30 pts. with JIA (ILAR criteria), average age 11.56 (±5.18) years, average disease duration 5.12 years (±3.45). Pain intensity and child's overall well-being during the previous week was assessed independently by parents and children over 12 years (19 pts) on visual analogue scale (VAS). Physician assessed the child's overall disease activity on VAS (PGA) and the following indicators were recorded also: number of limited motions joints, active joints, and C-reactive protein (CRP). Spearman's rank correlation was used as statistical method. **Results.** There was statistically high correlation between children's and parent's assessment of pain intensity and overall well-being (p<0,01), as well between the pain intensity and PGA (p<0,05). Pain intensity and overall well-being of each child were also high significant correlated (p<0,01). All indicators of disease activity, except CRP were significantly correlated with pain intensity (p<0,01) and parent's assessment of overall well-being (p<0,05), but there was no significant correlation with overall well-being assessed by child (p>0,05). **Conclusion.** Parents and children have a good agreement in rating pain intensity and overall well-being. Therefore the parent's opinion for younger children could be accepted as accurate. Opposite of the pain, mainly depended of the disease activity, overall well-being is determined by many other factors as psychological, social, etc and therefore couldn't be used as disease activity indicator in teenage age.

References

1. Antony KK, Schanberg LE. Pain in children with arthritis: a review of the current literature. *Arthritis Rheum* 2003;49:272-9.

The accuracy of prediction of functional outcome in severe acquired brain injury. A one year analysis in our rehabilitation unit

S. Bargellesi¹, A. Bazzana¹, P. Boldrini²

¹Rehabilitation Medicine- Severe Brain Injury Unit, Rehabilitation Hospital of High Specialization, Motta di Livenza (TV)

²Chief of Rehabilitation Medicine Department, Treviso

Introduction. The aim of the study deals with data analysis and comparison after one year of application of an individual overall plan (IOP) new form, with Severe Acquired Brain Injured (SABI) people admitted to our Rehabilitation Unit (RU). This new form of IOP is divided into four section (Actual Situation, Expected Global Outcome, Expected Functional Outcome and Further Potential Rehabilitation Needs) and is organized in a multiple choice way. So we were easily able to compare the expected functional outcome in the IOP, with the real outcome at the discharge from our RU. **Materials and methods.** We considered all the SABI patients discharged from our RU in 12 months (7/1/2008-6/30/2009). Data were collected from the analysis of the new IOP form, the Hospital Discharge Form and the SABI National Register. Functional Outcome indicators were: Level-Cognitive-Functioning, Glasgow-Outcome-Scale-Extended, Disability-Rating-Scale, Barthel-Index-Modified, Functional-Ambulation-Categories, Supervision-Rating-Scale. **Results.** The admission in our specialized RU occurred after mean 70 days from the acute event and the long of staying in RU was mean 82 days. The 14% interrupt hospital care due to complications. The main features of the casemix consisted on: low cognitive capacity patients (21% Vegetative-State, 16% Minimal-Consciousness-State); severe disability (82% GOSE level 2-3; 69% with GOSE level 3 and DRS categories 3-7), high assistance needs (BMI mean 5 points). At discharge from our RU, the inter-professional approach driven by our new IOP form, produced improvements either in cognitive disorders, either in disability and even in ADL in most cases: 50% improved cognitive capacity; 40% decreased disability (GOSE, DRS); 68% improved autonomy. Tracheotomy tube was removed in 40% patients and PEG in 47% patient. But the most original aspect of this study deals with comparison between the achieved functional outcome at the discharge with the expected one in IOP. The coherence

for FAC was 82%, for SRS the 76 %, for GOSE the 63 %, for DRS the 66 % and the 50% for BIM. **Conclusion.** The new form of IOP allowed us to verify the reliability of our outcome predictions. We observed maximum predictability for the ambulation autonomy level and for the supervision needs, but even for GOSE and DRS the predictability (63% and 66%) was acceptable, since the lack of coherence (37%-34%) was only of 1 category.

References

1. Comitato-Sezione S.I.M.F.E.R. GCA. Protocollo di valutazione riabilitativa di minima della persona con Grave Cerebrolusione Acquisita. *Ital.J Rehab Med-MR2006*; 21:55-86
2. Boldrini P, Maietti A, Basaglia N. "Progettazione e realizzazione di un registro regionale delle gravi cerebrolusioni acquisite in Emilia Romagna. *Europa Medicophysica* 2004; 40 (suppl. 1 to no.3): 9-1

Rehabilitation program in patients with knee osteoarthritis

C. Cuenca-González, F. Pascual-Gómez, K.V. Méndez-Saavedra, I. Barca-Fernández, I. Flores-Torres, A. Herranz-Torrubiano

Physical Medicine and Rehabilitation Departament, San Carlos Hospital. Madrid, Spain.

Introduction. The initial treatment of oosteoarthritis is based on non-pharmacological treatment (patient education, weight control, changes in lifestyle habits, physical therapy and assistive products) and pharmacological treatment. The objectives are decrease pain, maintain or improve range of motion and avoid functional impairment. **Materials. and methods.** Descriptive cross-sectional study 19 patients with gonarthrosis were included into the research. They were evaluated before and after rehabilitation treatment. Variables: age, sex, BMI, rehabilitation treatment, prescription of orthoses or assistive products, SAR-F clinical rating scale, pharmacological treatment, home exercise program and adherence to treatment. **Results.** We included 19 patients (18 women and 1 man), mean age 66.84 (+ -4.2). BMI average (27, 23). Magnet therapy (57.89%), hidrokinestherapy (21.05%), short-wave therapy (15.78%) , patients whose did not need treatment in training room (5.26%). Orthosis was prescribed only to 1 patient and 89.47% did not require assistive products. The mean clinical rating scale increases in 27, 9 (p<= 0.05). At the moment of the discharge 36.84% received treatment with chondroitin sulphate supplements and 47.36% with some NSAIDs or analgesics. 10.52% did not perform home exercise program. 100% of patients had adherence to the treatment. **Conclusion.** Patients with knee osteoarthritis included in this study followed correctly the advices of posture and patterns of home exercise program. We observed a significant reduction in pain and improvement in function. We found decrease in analgesics and anti-inflammatory intake .

References

Christensen R, et al. Effect of Wheight Reduction in Obese Patients Diagnosed with Knee Osteoarthritis: A Systematic Review and Metaanalysis. *Ann Rheum Dis.* 2007, April; 66: 433-439.
Giménez Vasallote,S , et al. Guía de buena práctica clínica. Recomendaciones de buena práctica clínica en artrosis. *Semergen.* 2008;34:143-8
Vázquez Arce, MI, et al. Valoración clínica e instrumental en la artrosis de rodilla. *Rehabilitación (Madr).* 2009;43: 223-31.

Case study of patients attended in a rehabilitation poly-clinic

K.V. Méndez-Saavedra, I. Barca-Fernández, C. Cuenca-González, I. Flores-Torres

Physical Medicine and Rehabilitation Departament, Clinico San Carlos Hospital. Madrid, Spain.

Introduction. Patients attended for the first time in our medical office have varied pathology. Many are cared and treated after first clinical evaluation. Other group require follow-up in primary care centers and the rest are referred to our specialized rehabilitation consults. **Materials and methods.** Descriptive cross sectional study 251 patients enrolled were referred to rehabilitation . Data collected during may and june of 2009. Each person had an appointment in our agenda of general rehabilitation. They came from the first level of care and from another departments of our Hospital. Variables: age, sex, pathology, rehabilitation treatment and pharmacotherapy. Statistical analysis SPSS version 9.0. **Results.** 167 women, 81 men. The median age is 58. (+ - 16.7). We observed the following diseases: traumatic pathology without fracture (32.3%), fractures (24.

3%), degenerative disorders (16.7%), related to spine (13.5%), neurological impairment (3.6%), lymphedema, respiratory disease and rheumatic disorders (1.6%) and dysphonia (1.2%). 19.9% had no criteria for medical treatment and 25.9% were referred to the first level of care. Prescribed rehabilitation treatment: electrotherapy and kinesitherapy (12.7%), combination of both (11.2%), hydrokinesitherapy (5.6%), home program rehabilitation (2.4%), occupational therapy (2%), lymphatic drainage (1.6%) and speech therapy (1.2%). Pharmacological treatment: none (49.4%), analgesia first step according to who's analgesic Ladder (19.9%), analgesia second step (12.4%), adjuvants (7.6%), chondroitin sulphate supplements (6.8%). **Conclusion.** In our study, musculoskeletal and joint disorders are the most usual entities observed. Patients needing follow-up in specific rehabilitation units are few instead a large number do not need specific treatment, therefore these patients are referred to the first level of care.

References

N Calcerrada-Diaz Santos a, et al. Sistema de clasificación de patologías en Rehabilitación en pacientes ambulatorios. Rehabilitación (Madr). 2006;40:180-7.
 J.A. Expósito Tirado. M.E, et al. Indicadores de calidad asistencial en rehabilitación. Rehabilitación (Madr). 2009;43:131-7.

Cardiac Rehabilitation: Is Ischemia Really Important?

M.M. Ribeiro, H. Reis Costa, S. Marques, H. Castro, F. Preza, S. Gonçalves Viamonte

Centro Hospitalar do Porto, Hospital de Santo António. Oporto, Portugal

Introduction. Exercise stress testing (EST) is a reliable and widely used method for evaluating patients as part of comprehensive cardiac rehabilitation program (CRP). It determines functional capacity, diagnoses myocardial ischemia, arrhythmias, heart rate and blood pressure responses to exercise. The purpose of this work is to assess the benefits of a CRP in a high-risk population with coronary heart disease (CHD), namely the variation of myocardial ischemia diagnosed by EST and its prognostic value. **Materials and methods.** The authors conducted a retrospective study, with review of clinical data of 134 patients with CHD admitted in 2008 in a Cardiovascular Rehabilitation Unit. EST was performed in all patients at the beginning of CRP and at three, six and twelve months after. The authors selected the patients with myocardial ischemia in, at least, one EST. **Results.** N=23 patients had myocardial ischemia in, at least, one EST (3 female; 20 male; mean age 64,5 years). Ischemia in initial EST was seen in 19 patients (82,6%); 14 patients (60,9%) continued to have ischemic changes at follow-up. 4 patients (17,4%) had ischemia only at the 3 or 6 months EST. All patients had significant increase in functional capacity (exercise time and METs). None of them had cardiovascular complications, or needed angioplasty or revascularization surgery. **Conclusion.** All patients showed a reduction in ischemia, 12 months after cardiac rehabilitation. The appearing of ischemic changes in EST at 3 or 6 months after CRP could be related with increase of exercise threshold reached, due to significant improvement in functional capacity. These results, although obtained in a small sample, are encouraging to conclude that cardiac rehabilitation is an important tool in the management of patients with ischemic high risk.

References

Cardiac Rehabilitation. W E Kraus et al. Humana Press 2007: 111-112.

The Evaluation of The Effects of Therapeutic Exercise On Lumbar And Pelvic Pain In Pregnant Women of Isfahan City

Sayed Mohsen Mirbod, Fateme Mortazi, Mariam Zarin Moghadam
 Rehabilitation School, Isfahan University of Medical Science,

Introduction. According to the studies from 1999 to 2008, 50% of the pregnant women suffer from Low back pain. Decreasing in low back pain by exercise therapy is unknown because the studies are inconclusive. the aim of the presence investigation is effect of the exercise therapy in decrease low back pain & pelvic pain in pregnancy in Isfahan city. **Materials and methods.** This is control trial study. Around 58 pregnant women 3 to 7 month of pregnancy aging between 20 to 35, being visited in our obstetric and Gynecologic Clinic that suffer from low back pain & pelvic pain. They considered in 2 group accidentally. First group (n=29) treated the exercise and

second group(n=29) was without any treatment. All of the patients completed the first questioner (number 1) that consists of the information about low back pain & ability of daily activity. One month later all of them completed the second questioner (number 2). **Results.** The data were analyzed by SPSS 14 software. We found that there was a significant difference between treatment group & controlling group in all of the daily activity (P<0/05). Also we detect a significant difference decrease in pelvic & low back pain in treatment group. But we don't detect the significant difference in controlling group. (P<0/05). **Conclusion.** Exercise therapy can decrease the pelvic & Low back pain during pregnancy and increase the quality of the pregnant life.

References

1. Norases Fs, ShimoAK, Lopes MH. Low back pain during gestation. Rev lat Am En fermagem. 2006 Jul- Aug; 14 (4):620-4
 2. Mogrenl. Perceived health. Sick leave, psychosocial situation, and sexual life in women with low- back pain and pelvic pain during pregnancy. Acta obstet gynecol scand. 2006; 85(6):647-56.
 3. Haugland KS, Rasmussen S, Daltveit AK. Group intervention for women with pelvic girdle pain in pregnancy. A randomized controlled trial. Acta obstet gynecol scand 2006; 85(11):1320-6
 4. Pennick VE, Young G. Interventions for preventing and treating pelvic and back pain in pregnancy. Cochrane Database Syst Rev. 2007 Apr 8; (2)CKool39

Effectiveness of the treatment with peri-tendineous injection of hyaluronic acid in degenerative tendinopathy

A. Rocco^{1,3}, C. Ljoka^{2,3}, G. Tancredi^{2,3}, C. Foti^{2,3}

¹INI Medicus Monteripoli Rehabilitation Clinic, Tivoli (Italy)

²PRM Chair, Doctorate and Specialization School, Tor Vergata University, Rome (Italy),

³Instrumental Semeiotic Division SIMFER

Introduction. Sodium Hyaluronate are glycosaminoglycans with unbranched polysaccharide chain, formed by residual of glucuronic acid e N-acetilglucosamina. Polymers are organized in a reticular structure with high density and clear macroscopic aspect and a microscopic structure able to guarantee hydration, plasticity e viscosity of tissue. The aim of the study is to appraise the efficacy of injection treatment of hyaluronic acid with different molecular weight in patients affected by degenerative tendinopathy. **Materials and methods.** Forty patients suffering from degenerative condition of Achilles tendon (1) and of III-IV hand flexor tendon (2) were subjected to a cycle of number 3 infiltrations of hyaluronic acid with different molecular weight (MW 500-1200 Kdalton) once a week. The Physiatric evaluation was completed by instrumental examination by a system consisting of echographic linear probe (10,5-12,5 Mhz) (3), a Power Doppler examination and with the administration of rating scales of mobility and pain (VAS and Rivermead Mobility Index, Test of manual dexterity). Infiltrative treatment was performed after locating the degenerated area through the ultrasound examination with a multiple dosing peri-tendon using a 'needle, 25 G 0.5 X 16 mm. **Result and conclusion.** The patients evaluated at 6 weeks after the third infiltration have presented a significant improvement in clinical parameters with reduction of pain, improvement of range of movement (ROM) and consequent reduction of disability related to the underlying condition. A preliminary analysis of data showed a different behavior of the drug as a function of molecular weight and the seat of inoculation.

References

1. Tatari H, Skiak E, Destan H, Ulukuş C, Ozer E, Satoglu S. Effect of hylan G-F 20 in Achilles' tendonitis: an experimental study in rats. Arch Phys Med Rehabil. 2004 Sep;85(9):1470-4. PMID: 15375818 [PubMed - indexed for MEDLINE]
 2. Salini V, De Amicis D, Abate M, Natale MA, Di Iorio A. Ultrasound-guided hyaluronic acid injection in carpometacarpal osteoarthritis: short-term results. Int J Immunopathol Pharmacol. 2009 April-June;22(2):455-460. PMID: 19505398 [PubMed - as supplied by publisher]
 3. Migliore A, Tormenta S, Martin LS, Valente C, Massafra U, Granata M, Alimonti A. Open pilot study of ultrasound-guided intra-articular injection of hylan G-F 20 (Synvisc) in the treatment of symptomatic hip osteoarthritis. Clin Rheumatol. 2005 Jun;24(3):285-9. Epub 2004 Dec 9. PMID: 15592903 [PubMed - indexed for MEDLINE]
 4. Rocco A, Tancredi G, Foti C. Efficacia del trattamento infiltrativo con acido ialuronico nella tendinopatia degenerativa dell'achilleo. (Roma) 37° Congresso Nazionale SIMFER 20-23 Settembre 2009, Campobasso.

Strontium ranelate effects in patients with bed rest syndrome. Clinical and instrumental evidence after 60 days of treatment

A. Rocco^{1,2}, R. Di Donna¹, G. Pacifici¹, M. Penna¹, S. Gentili³, J.V. Faroni¹

¹INI Monteripoli Rehabilitation Clinic, Tivoli (Italy)

²Instrumental Semeiotic Division SIMFER

³Rehabilitation Department of Tor Vergata University, Rome (Italy)

Introduction. Osteoporosis is characterized by bone fragility that accompanies an increased risk of fracture. Getting old occurs a progressive imbalance between bone resorption and new formation. This can be true in several other circumstances. These include: Bone subjected to a mechanical reduction as a result of bed rest syndrome (immobilization). Presence of reduced sex hormone concentrations such as after the menopause in females. Long Corticosteroids therapies used for treatment of a variety of conditions as like arthritis or asthma. **Materials and methods.** Sonic DMB allows precise and a reproducible measurement system, the phalanx is a home largely representative of changes in bone mass (1). Thirty patients with bed rest syndrome were assessed at admission to hospital with clinical examination, rating scales (barthel index, rivermead mobility index) and MOC QUS. Patients have been cared for and brought to rehabilitation project in which there was explicit in the program Pharmacotherapeutic use of strontium ranelate (2 g/die)(2) (3) (4) combined with vitamin D3 (25,000 IU/month). Patients began their journey of rehabilitation after 60 days were examined and the reevaluation MOC QUS administration of rating scales. **Results.** In the 80% of the population studied the results obtained showed a significant trend for the recovery of bone density e for the improvement of the values obtained by the administration of rating scale as early as after the second month of treatment. **Conclusion.** This improvement means that strontium ranelate represents a therapy of choice for the treatment of osteoporosis in patients with bed rest syndrome.

References

1. Blake GM, Wahner HW, Fogelman I. The evaluation of osteoporosis: dual x-ray absorptiometry and ultrasound in clinical practice. London: Martin Dunitz Ltd; 1999 .
2. Wien Klin Wochenschr. 2005 Nov;117(21-22):728-38. Strontium ranelate: a novel concept for the treatment of osteoporosis
3. Reginster JY, Deroisy R, Jupsin I. Drugs Today (Barc). 2003 Feb;39(2):89-101. Strontium ranelate: a new paradigm in the treatment of osteoporosis.
4. Reginster JY. Curr Pharm Des. 2002;8(21):1907-16. Strontium ranelate in osteoporosis.

An observational study of prevalence of osteoporosis in a group of young adults affected by severe developmental disabilities

C. Durante¹, M. Gasparini¹, P. Giovanzana¹, G. Masserano¹, M. Montanaro¹, G. Poggi¹, R. Tiepolo¹, L. Rusca¹, S. Braga²

¹Complex Structure of Rehabilitative Medicine, ASL BI , Biella

²Rehabilitation Center "Domus Laetitia", Sagliano Micca (Biella).

Introduction. Osteoporosis is a frequent condition ever in young adults, especially those affected by severe developmental disabilities, because of a various number of risk factors. In the present study the Authors examine the correlation between bone mineral density and others risk factors. **Materials and methods.** A group of 109 adults with severe developmental disturb was studied analyzing BMD value (calculated with calcaneous ultrasound mineralometry) and methabolic and anamnestic dates were related. **Results.** More of 50% of subjects has BMD Tscore <-2,5 and a lot of risk factors for fractures. The correlations among data are also discussed. **Conclusion.** Life expectancy for these people is increasing and it's very important to assess bone mineral density and know risk factors to prevent new fractures.

References

1. Sheridan KJ Osteoporosis in adults with cerebral palsy Dev Med Child Neurol 2009; Oct 51:suppl 4, 38-51.
2. Lohiya GS, Tan-Figueroa L, Iannucci A Identification of low bone mass in a developmental center: finger bone mineral density measurements in 562 residents. J Am Med Dir Assoc 2004;Nov-Dec 5(6), 371-6.
3. Gilbert SR, Gilbert AC, Henderson RC Skeletal maturation in children with quadriplegic cerebral palsy J pediatric Othop 2004;May-Jun 24(3), 292-7.
4. Linglart A., Marchand I, Djavid A, Senec C, Benigni I, Rothenbuhler A, Fonin V Osteoporosis in children with cerebral palsy Arch Pediatr 2009;Jun 16(6), 614-5.
5. Jaffe JS, Timel AM Prevalence of low bone density in institutionalized men with developmental disabilities J Clin Densitom 2003;6(2), 143-7.

Long-term follow-up of surgical correction for equinovarus foot deformity in adult stroke patients. A gait-analysis based study

S. Carda, M. D'Innocenzo, A. Vannicola, M. Invernizzi, M. Zaccala, A. Florio, C. Cisari

SC Medicina Fisica e Riabilitativa AUO "Maggiore della Carità", Novara, Italy; Dipartimento di Medicina Clinica e Sperimentale, Università del Piemonte Orientale "A. Avogadro", Novara, Italy

Introduction. In patients with hemiplegic stroke, equinovarus foot is one of the most frequent deformities. Outcome evidence for surgical correction of equinovarus foot is scarce, and results are usually assessed only clinically. Moreover, concerns about possible loss of function after elongation of the plantar flexor muscles are still at issue. Long-term follow-up data have never been published. The objective of this study was to verify if surgical correction of equinovarus foot can improve gait speed and function at long-term. **Materials and methods.** We used a retrospective, nonrandomized design. 16 chronic hemiplegic patients who underwent surgical correction of equinovarus foot were evaluated before and at least 30 months after surgery. Outcome measures were Walking Handicap Score (WHS), Functional Ambulation Categories (FAC), client's satisfaction, temporal- spatial parameters, gait kinematics and kinetics, and paretic propulsion. Data were collected clinically and using 3-dimensional gait analysis. **Results.** Patients had a median follow-up of 37 months. They improved significantly in WHS and FAC scores. At follow-up they walked faster and significantly improved in temporal-spatial, kinematic and kinetic data. Client's satisfaction with surgical and rehabilitative program was, on the whole, good. No patient worsened his/her function. **Conclusion.**

Surgical correction of equinovarus foot deformity in patients with stroke is a safe and effective procedure even at long term follow-up. Concerns about possible loss of function should be reconsidered.

References

1. Roper BA, Williams A, King JB. J Bone Joint Surg Br 1978;60:533-5.
2. Pinzur MS, Sherman R, DiMonte-Levine P, et al. J Bone Joint Surg Am 1986;68:1249-57.
3. Carda S, Bertoni M, Zerbinati P, Rossini M, Magoni L, Molteni F. Am J Phys Med Rehabil 2009;88:292-301.

Effect of fesoterodine on urodynamic parameters and quality of life in patients with spinal cord injury

M. Moharić

University Rehabilitation Institute, Soča, Ljubljana, Slovenia

Introduction. The goal of treating detrusor overactivity (DO) is to reduce the reflex irritability of the overactive bladder (OAB) (1). Many patients with neurogenic DO can be treated effectively with oral anticholinergic drug. However, they often have troublesome side-effects which reduce patient compliance. Doses insufficient to restore urinary continence are often used. Fesoterodine is one of the new generation antimuscarinic agents, with reduced central nervous system penetration and better selectivity for the M3 subclass of acetylcholine receptors, resulting in improved tolerability (2). The aim of our study was to assess the efficiency and safety of fesoterodine in neurogenic DO. **Materials and methods.** Ten patients with spinal cord injury aged 18 to 54 years and urodynamically confirmed neurogenic DO were first three weeks treated with fesoterodine 8 mg/day and then for three weeks with 12mg/day dose. The effect of the treatment was evaluated by the cystometry and the Qualiveen-Short form questionnaire. The side effects of the treatment were assessed. **Results.** In all the patients, the 8 mg/day dosage was not adequate and so all were treated with 12 mg/day dose. In case of the effective treatment quality of life was better. The most commonly reported adverse event was dry mouth, a commonly reported side effect of antimuscarinic therapy. In most cases, the dry mouth was mild or moderate. **Conclusion.** Patients with a neurogenic bladder disorder usually need a higher dose of antimuscarinics than patients with idiopathic detrusor overactivity. Fesoterodine 12 mg/day seems to be efficient and safe treatment of the neurogenic DO.

References

1. Yoshimura N, Chancellor MB. Current and future pharmacological treatment for overactive bladder. J Urol 2002; 168:1897-913.
2. Ellsworth P. Fesoterodine for the treatment of urinary incontinence and overactive bladder. Therapeutics and Clinical Risk Management 2009;5 869-876.

Quality of life in older patients with femoral fracture undergoing rehabilitation treatment

I. Gallo, M. Serrao, F. Papalia, M. Ferrari, E. Marchi, W. Silvestri, M.T. Stancati, K. Girolami, P. Marino, S. Monami.

Casa di Cura Policlinico Italia, Rome, Italy.

Introduction. Inpatient rehabilitation is important for elderly patients with femoral fractures in order to recover their previous functional condition. Only few studies have evaluated the quality of life (QoL) and its relationship with the functional improvement and clinical status in these patients. **Materials and methods.** Thirty eight out of 258 patients (10 males and 28 females; mean age 80.2±10.8) operated for femoral fracture and consecutively admitted in our Rehabilitation Centre from January 2009 to December 2009 were investigated. Patients were assessed by SF-36 questionnaire within the first week from the admission. Clinical, demographic data and activity of daily life (ADL) and motor function at the admittance and discharge were evaluated by means of ad hoc scales (e.g. Barthel, FIM, Deambulation Index). One-way ANOVA test was used to compare mean differences between normal population and patients and among clinical characteristics. Spearman rank test was used to correlate the SF-36 items' scores with the other scales scores. **Results.** We found that: i) patients scored lower on almost all SF-36 items than general Italian population; ii) females scored lower than males in social activity and mental summary items; iii) patients with urinary incontinence showed lower values in physical pain, general health, vitality, mental healthy and summary mental items; iv) no significant correlation between SF-36 scores and length of stay and Barthel, FIM and DI scores assessed at the discharge was found. **Conclusion.** The adverse impact of femoral fracture on quality of life and functionality needs to be recognized by health personnel working in the rehabilitation field so that adequate health resources can be devoted to preventing and treating this debilitating condition. However, in older patients with femoral fracture the QoL does not predict the functional recover after the rehabilitation treatment.

References

G. Apollone, P. Mosconi, JE Ware. Questionario sullo stato di salute SF-36.

Behavioral and Cognitive Functioning after Traumatic Brain Injury

F. Tebaldi¹, F. Stablum², A. Cantagallo³

1Centro Efesto, Centro per l'autonomia delle persone disabili, Loreggia (Padova), Italy

2Dipartimento di Psicologia, Università di Padova, Italy

3Modulo di Neuropsicologia Riabilitativa, UOMR, Dipartimento di Neuroscienze/Riabilitazione, Ospedale ed Università di Ferrara, Italy

Introduction. Behavioral and cognitive disorders often occur after Traumatic Brain Injury. Controversial results about the relation between these outcomes are reported (Sawchyn et al., 2005; Malec et al., 2007). The aims of our study were: 1) to explore the relation between different aspects of behavioral functioning of TBI patients; 2) to investigate the cognitive functioning of patients with behavioral disorders compared to patients without behavioral disorders; 3) to correlate the behavioral and cognitive functioning of both groups. **Materials and methods.** 74 severe TBI patients admitted in the Neuropsychological Rehabilitation Unit took part in our study [inclusion criteria: LCF>6; time post-injury<9 years; no history of neurological or psychiatric disorders]. We assessed the patients' cognitive functioning with tests commonly used in clinical neuropsychology, and the behavioral functioning with the Functional Assessment Measure. **Results.** 1) We found significant correlations between the FAM items: "emotional controls", "interpersonal relationships" and "awareness"; 2) patients with behavioral disorders compared to patients without behavioral disorders showed a worse performance in tests for attention and executive functions; 3) for patients without behavioral disorders each behavioral functioning measure significantly correlated with each attention and executive function test, whereas for patients with behavioral disorders the only significant correlation was between "awareness" and a cognitive flexibility test. **Conclusion.** Our findings support the role of a rehabilitative approach which focalizes on both cognitive and behavioral functioning as a useful tool for TBI patients. Future research should be directed towards a deeper understanding of the relation between attention, executive functions and behavioral functioning.

References

Malec, J.F., Testa, J.A., Rush, B.K., Brown, A.W., Moessner, A.M. (2007). Self-assessment of impairment, impaired self-awareness, and depression after traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 22(3):156-166.

Sawchyn, J.M., Mateer, C.A., Braxton, K.B. (2005). Awareness, emotional adjustment, and injury severity in postacute brain injury. *Journal of Head Trauma Rehabilitation*, 20(4):301-314.

Gait training on Lokohelp after stroke: analysis of the benefits in chronic patients

S. Chiari², L. Bissolotti^{2,3}, C. Calabretto^{1,2}, M. Gobbo^{1,3}, E. Baruzzi^{1,3}, P. Gaffurini^{1,3}, C. Orizio^{1,3}

¹LARIN: Laboratorio di Ricerca Neuromuscolare e dell'Attività Fisica Adattata

²Servizio di Recupero e Rieducazione Funzionale, Casa di Cura Domus Salutis, Brescia

³Istituto di Fisiologia Umana, Dipartimento di Scienze Mediche e Biotecnologie, Facoltà di Medicina e Chirurgia, Brescia

Introduction. Robotic gait training of post-stroke patients is a promising and interesting issue of rehabilitation. **Materials and Methods.** On post-stroke patients, the present study was developed to obtain informations about second type robotic gait training (RGT) using LOKOHELP and standard gait training (SGT). 30 consecutive chronic haemiparetic (OAI >6mths) patients have been enrolled; 15 of them were assigned to SGT (mean age: 64.1±14.1yrs) and 15 to RGT (mean age: 57.1±13.1yrs). RGT group underwent to 30mins 15training sessions on a three times per week protocol. SGT group underwent to gait training according to Bobath's concept. (15 sessions). During RGT sessions speed range was from 1km/h up to 1.8km/h. In RGT Group, patients with 0.3meters/sec gait speed or less was immediately trained with LOKOHELP (90% of the patients). Gait velocity on treadmill ranged from 80% to 150% of self selected speed. At the beginning of the treatment (T0), just at the end (T1) and 3months later (T2) Lower limb Motricity Index of haemiparetic side, Rivermead Mobility Index (RMI), self selected gait speed and number of steps to run 50m corridor were collected. **Results.** The Motricity score of the affected lower limb improved in RGT group (+12%), with a reduction of the initial gap between the two groups. Patients included in RGT Group presented a better RMI score at follow up (+25%). In RGT group, gait speed was not any more different than SGT speed at T1 and T2. RGT speed increased of about 40% value and the steps necessary to walk a 50m corridor showed a 11% reduction. **Conclusion.** In chronic post-stroke patients RGT on Lokohelp was able to induce an improvement in lower limb strength; the treatment on Lokohelp reduced the number on steps and increased the length of step in chronic post-stroke patients; RGT on Lokohelp is an effective strategy to improve motor performance in severely affected post-stroke patients.

Functional and kinematic evaluation of athletes with spinal pain syndromes by a new two optoelectronic cameras system

S. Chiari², L. Bissolotti^{1,2}, M. Ometto^{1,4}, C. Calabretto^{1,2}, M. Gobbo^{1,3}, D. Lussignoli¹, E. Baruzzi^{1,3}, P. Gaffurini^{1,3}, C. Orizio^{1,3}

¹LARIN: Laboratorio di Ricerca Neuromuscolare e dell'Attività Fisica Adattata

²Servizio di Recupero e Rieducazione Funzionale, Casa di Cura Domus Salutis, Brescia

³Istituto di Fisiologia Umana, Dipartimento di Scienze Mediche e Biotecnologie, Facoltà di Medicina e Chirurgia, Brescia

⁴Dipartimento di Ing. Meccanica e Industriale, Facoltà di Ingegneria, Università di Brescia

Introduction. Evidence based rehabilitation of spinal pain syndrome (neck-NP or low back pain LBP) needs an accurate, specific and objective evaluation of functional recovery. At present time the kinematical analysis of trunk movements is one of the most interesting and fine way to obtain objective data about spinal mobility, proprioception and quality of the movement. This paper describes the potential applications and advantages coming from a new two optoelectronic infrared cameras (Gemini, BTS spa, Milano, Italy). **Materials and Methods:** Tridimensional reconstruction of the movement is given by a 30Hz sampling of markers position. Consequently marker speed, acceleration and angular displacement describing trunk performance are obtained. trunk motion can be studied during extension and lateral bending of lumbar and thoracic spine. Data can be detected during neck rotation, lateral bending and flexio/extension movement. Movement efficiency can be determined by frequency analysis of markers trajectory and precision of the movements are quantitatively defined by the ability to reach a certain standardized target or to come back to same original position. Kinematic evaluation can be systematically linked to clinimetric tools to evaluate pain (VAS 0-100), disability (Roland Morris Questionnaire, Oswestry Disability Index, Neck Pain Disability Index, SF36) and distress (DRAM) enabling the clinicians to judge

the functional recovery of the patients after a rehabilitation program. **Results.** Specific analysis protocols of the spine have been created and we are actually performing a total lateral bending protocol (TLB) and an extension protocol that can be performed with or without the hands placed on the buttock. NP syndromes are evacuated through a protocol with three markers placed on a special helmet and the patient performs rotation, lateral bending and flexion-extension of neck. **Conclusion.** The integration of Gemini BTS with an external reference system allows the clinician to perform with the possible highest precision a static and dynamic postural assessment of the trunk.

Inter-operator reliability of a complete physical examination for low back pain and sciatica

G. Brugnoni

Physical Medicine and Rehabilitation Dept. Casa di Cura "Capitano", Milano

Introduction. The purpose of this study is to evaluate the reliability of a physical examination for low back pain and/or sciatica, based on classic signs and two tests (3rd and 4th) described by R.Maigne(1). **Materials and methods.** 75 patients who suffered from low back pain and/or sciatica were examined by two physicians, from 2007 to 2009. Tests: 1° Lumbar Active Range Of Movement; 2° Painful Active Movement; 3° Provoked pain on thoracic and lumbar spinous processes; 4° Allodynia in metameric correspondent areas. 5° Neurological signs: 5.1) cutaneous sensibility, 5.2) tendon reflexes, 5.3) motricity. 6°: Dura-mater and lumbar spinal roots signs: 6.1,6.2,6.3): Neri' signs, 6.4) Lasègue, 6.5) Femoral stretch test. **Results.** Evaluation: proportion agreement (PA); coefficient Kappa (K). Tests: 1° PA 0.76, K 0.493; 2° PA 0.84, K 0.523; 3° PA 0.87, K 0.622; 4° PA 0.74, K 0.457; 5°: a) PA 0.98, K 0.793; b) PA 0.93, K 0.581; c) PA 1, K 1; 6°: a) PA 0.98, K 0.85; b) PA 0.98, K 0.85; c) PA 0.94, K 0.305; d) PA 1, K 1; e) PA 0.98, K 0.85; **Conclusion.** 1st and 2nd tests have the same values as the other similar studies(2); 3rd indispensable to determine the painful segment, shows a "substantial" K; 4th shows better values than other studies based on osteopathic manoeuvre (3). Neurological and dura-mater signs show very low presence of signs, and high P.A. and K. This examination demonstrates moderate to substantial reliability, and can be deemed acceptable.

References

1. Maigne R. Douleur d'origine vertébrale. 2006 Issy-les-Moulineaux: Elsevier Masson 2006.
2. Essendrop M, Maul I, Laubli T, Riimimaki H, Schibye B. Measures of low back function: a review of reproducibility studies. Clin Biomech (Bristol, Avon) 2002 May; 17(3):235-493.
3. Seffinger MA, Najm WI, Mishra SI, Adams A, Dickerson VM, Murphy L. Reliability of spinal palpation for diagnosis of back and neck pain: a systematic review of the literature. Spine. 2004 Oct 1; 29(19):E413-425.

Correlation of recreational physical activity and sports activity in serbian school children

D. Nikolic¹, I. Petronic¹, Z. Milincic², S. Simeunovic², D. Cirovic¹, I. Novakovic², S. Nedeljkovic², M. Vukotic²

¹Physical Medicine and Rehabilitation Department, University children's Hospital, Belgrade, Serbia

²School of Medicine, University of Belgrade, Belgrade, Serbia

Introduction. Physical activity is one of important parameters for healthier development in children. Aim of our study was to evaluate duration of recreational and sports activities in school children over the period of 5 years and to establish proportion of time spent in sports activity over recreational physical activity. **Materials and methods.** We have evaluated 1564 school children from Serbia. First group were participants age of 10 years on first examination and second group were from the same population after 5 years, when they were 15 years. Recreational and sports physical activity was evaluated by hours per week children spent in activity. **Results.** In the first group of participants mean value of recreational activity was 4.48±0.22 hours per week while after 5 years the mean value was 5.38±0.11 hours per week. Regarding mean value of activity spent in sports, in the first group it was 2.31±0.06, while in the second group it was 1.54±0.06. In the group of children 10 years of age recreational activity is almost twice longer in duration than sports involvement, while over the period of 5 years this proportion is much higher to almost two thirds of the time. **Conclusion.** Our study

pointed out that as school children are getting older there is significant elevation in the duration of time spent in recreational activities, while there is significant decrease in the amount of time spent in sports.

Hydrotherapy for management of spasticity in Primary Lateral Sclerosis (PLS)

D. De Cicco, Scialabba G., P. Volanti

Fondazione Salvatore Maugeri, IRCCS - Neurorehabilitation Unit, Mistretta (ME)

Introduction. Spasticity is the major medical problem for patients with upper motor neuron syndrome. Several therapeutic options are available for the treatment of spasticity, including oral medication, intramuscular or intrathecal Botulinum toxin A, physiotherapy. The effectiveness of available drugs is still uncertain, and they may cause adverse effects. Objective of our study was to compare the effects of conventional physiotherapy and hydrotherapy on spasticity, functional independence, and quality of life in patients with Primary Lateral Sclerosis (PLS). **Materials and methods.** thirty-four PLS inpatients with moderate to severe spasticity were randomly divided into 2 groups and matched for age, gender, ALS Functional Rating Scale-revised (ALSFRS-r), Ashworth (ASH) scores, oral baclofen or other treatments intake. The control group (n=16) received conventional physiotherapy twice a day, five times per week, for 8 consecutive weeks. The study group (n=18) also received conventional physiotherapy, as well as 50 min of water exercises 3 times per week. At baseline and after two months of treatment, were evaluated spasticity (ASH), ALSFRS-r, Functional Independence Measure (FIM), range of motion measurements, manual muscular test, spasm severity (Spasm Frequency Scale), pain (Visual Analogue Scale), quality of life (McGill QoL), and oral baclofen (or other medications) intake. **Results.** there was a statistical improvement in function (motor FIM domains) and spasticity (ASH) for both study and control groups. However, the hydrotherapy group demonstrated a larger improvement (p<0.05) than the control group. The hydrotherapy group also showed a significant improvement (p<0.05) in spasm severity, pain, and quality of life, compared to the control group. There was no statistical change in oral baclofen (or other medication) intake in the two groups. **Conclusion.** adding hydrotherapy to the conventional physiotherapy program can be helpful in reducing spasticity severity, improving function, and quality of life, not in decreasing oral baclofen (or other medications) doses.

Vitamin D and Osteoporosis: correlation in Multiple Sclerosis patient

G. Guarcello¹, G.T. Maniscalco², V. Baldassarre¹, C. Florio², M. Costa¹

¹U.O. S. C. of Physiokinesitherapy, Orthopedic and Neurotraumatology Rehabilitation, A.O.R.N. "A. Cardarelli" of Naples

²U.O.S.C. of Neurology, A.O.R.N. "A. Cardarelli" of Naples

Introduction. Multiple sclerosis (MS) is associated with reduced bone mass and higher frequency of osteoporosis. Clinical evidence suggests an important role of vitamin D as a modifiable risk factor in MS. The aim of this study was to evaluate factors influencing bone mineral density (BMD). **Materials and methods.** We examined 52 patients with Multiple Sclerosis, mean age 50,02 years (range 32-73), with mean age of disease onset 41.5 years (26-53) and a mean age of diagnosis 44.7 years (35-58). Serum 25(OH) vitamin D levels were measured. We measured calcaneus bone density by ultrasound device (Achilles Express, GE). **Results.** 34.6% of MS patients showed osteoporotic values of bone densitometry, 42.3% had values of Osteopenia and 23.1% have bone density values in the normal range. The mean values of the MS population studied were: T-score: -1.6 ± 3, Z-score -0.7 ± 2.5; Stiffness 79.2 ± 30. Low circulating levels of vitamin D have been found in our patients. **Conclusion.** MS Patients often have multiple risk factors for osteoporosis. Many patients with MS with low bone mass or previous fractures are not taking supplemental calcium or vitamin D, suggesting a potential area of improvement in care.

References

1. Ruth Ann Marrie et al. A cross-sectional study of bone health in multiple sclerosis. Neurology 2009;73:1394-1398
2. Salih Ozgocmen et al. Vitamin D deficiency and reduced bone mineral density in multiple sclerosis: effect of ambulatory status and functional capacity. J Bone Miner Metab (2005) 23:309-313
3. Guarcello G, Maniscalco GT, Baldassarre V., Florio C, Costa M. "Sclerosi Multipla e Osteoporosi: screening densitometrico di donne affette da sclerosi a placche", Europa Medicophysica 2009;45(Suppl. 1 to No.3)

Evaluation of rehabilitation outcome in hip fracture patients

G. Guarcello, V. Baldassarre, P. Monteleone, I. Quarto, M. Sollo, G. Terzolo, M. Costa

U.O. S. C. of Physiokinesiterapy, Orthopedic and Neurotraumatology Rehabilitation, A.O.R.N. "A. Cardarelli" of Naples

Introduction. The hip fracture is an acute event that can distort the quality of life in elderly person. The consequent high rate of disability and death requires coordination of every clinical decision, rehabilitation and nursing care for a appropriate clinical governance of this type of patient. The aim of our study was to identify factors associated outcome rehabilitation in patients after surgery for hip fracture and analyze how these factors affect the rehabilitation process. **Materials and methods.** We examined 20 female patients hospitalized in our department with sequelae of hip fracture. Mean age of sample was 65.7 years. Entering the ward the patients were subjected to routine blood tests in addition to being Physiatriac detail. As a means of assessing the rehabilitation outcome has been used the Harris Hip Score, an index measuring the result of enormous spread far considered one accepted standard, and only recently statistically validated, serum levels of hemoglobin and albumin were performed at the entry into the ward, during hospitalization and at discharge. **Results.** Data showed that patients with better recovery of nutritional status and general conditions reached a better score on the HHS both in absolute terms and in terms of progress during hospitalization. In fact, almost all patients during hospitalization have improved the score of HHS. **Conclusion.** Identification of status indicators (serum albumin, transaminases, etc..) at the entry and during hospitalization in department allows to provide rehabilitation protocols and to accelerate the achievement of the individual rehabilitation project of each patient.

References

1. Royal College of Physicians of London. Fractured neck of femur: prevention and management. London : Royal College of Physicians; 1989.
2. Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation. *J Bone Joint SurgAm* 1969;51(4):737-55.
3. Soderman P, Malchau H. Is the Harris hip score system useful to study the outcome of total hip replacement? *Clin Orthop* 2001;384:189-97.

Effect of hydrotherapy in the rehabilitative treatment of Multiple Sclerosis (MS)

P. Volanti, D. De Cicco

Fondazione Salvatore Maugeri, IRCCS - Neurorehabilitation Unit, Mistrretta (ME)

Introduction. Despite major advances in MS care and disease modifying therapies, no longer term benefit on disability and participation have yet been demonstrated. The supportive and symptomatic management provided by multidisciplinary rehabilitation programmes remain the mainstay of treatment. Aim of this study was to evaluate and compare the efficacy of conventional physiotherapy (CP) and hydrotherapy (HT) on impairment, disability, and quality of life of MS patients. **Materials and methods.** Sixty inpatients affected by chronic MS with mild to moderate disability (Expanded Disability Status Scale-EDSS scores \leq 6.5) were randomly assigned to two groups (CP or HT group), matched for age, gender, and EDSS scores. The CP group (n=28) received conventional physiotherapy twice a day, five times per week, for 8 weeks. The HT group (n=32) also received conventional physiotherapy, as well as 45 min of water exercises 3 times per week. At baseline, and at the end of the treatment, patients were examined on impairment (EDSS), disability (Functional Independence Measure, FIM), and quality of life (Mc Gill QoL). Secondary outcomes were muscle strength (manual muscular test, MMT), fatigue (Fatigue Severity Scale, FSS), spasticity (Ashwort scale), pain (Visual Analogue Scale, VAS), respiratory function (spirometric parameters). **Results.** No changes in impairment occurred in either group, as measured by the Expanded Disability Status Scale. At the end of the 8 weeks of treatment, the HT group improved significantly in disability, as assessed by the motor Functional Independence Measure (FIM) scores, and quality of life (Mc Gill QoL), compared with CP control group ($p < 0.05$). The HT group also demonstrated a larger improvement ($p < 0.05$) than CP group on spasticity (Ashwort scale), and pain (VAS). **Conclusions.** adding hydrotherapy to the conventional physiotherapy program improve function and quality of life in patients with multiple sclerosis.

Osteogenesis Imperfecta – Importance of the Rehabilitation Program

A Murgu, G Mologhianu, A Ionescu, A Nica

University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania

Introduction. Osteogenesis Imperfecta (OI) or the Lobstein Disease is a heritable defect, a rare one, that makes bones fragile because of a generalized decrease in bone mass (osteopenia). **Materials and methods.** We present two cases of females with OI type IA (Sillence Classification), diagnosed at an adult age. We evaluated the patients from a clinical, functional and quality of life point of view before and after 6 months of rehabilitation program, 3 sessions of two weeks as inpatient and 18 weeks as ambulatory patient to the IIIrd National Institute of Rehabilitation Medicine and Balneoclimatology Clinique in Bucharest. The two persons were treated with drugs and a complete rehabilitation program: kinetotherapy, physical therapy, massage, orthosis. **Results.** The global functional score (AQoL – 6D) used to evaluate the patients improved with 37%, the quality of life (using Quality of life (using Qualeffo 41) improved also with 42%. The patients could also complete a questionnaire regarding the quality of life after the 6 months of rehabilitation program compared with 6 months before when they were treated only with drugs, the quality of life improved with 67%. **Conclusion.** We underline the importance of the Rehabilitation Program for functional and quality of life improvement for adult patients with Osteogenesis Imperfecta.

References

1. Harrison's Principles of Internal Medicine, 13th edition, vol. 2, page 2111-2113;
2. Kelley. Rheumatology, page 654-658;
3. Ryckewaert A. Rhumatologie: Pathologie Osseuse et Articulaire, page 36-38;
4. Annales de readaptation et de medecine physique, vol. 44, sept. 2001, page 365-367;
5. Archives of Physical Medicine and Rehabilitation, vol 87, aug 1999, page 224-225.
6. Brotzman B: Clinical Orthopaedic Rehabilitation, 1996, page 78-81;
7. Nica A: Compendiu de medicina fizica si recuperare medicala, 1998.

Cerebrovascular impairments resulting in Electric Powered indoor/outdoor Wheelchair (EPIOC) Provision in North West London

Frank AO

Stanmore Specialist Wheelchair Service, Royal National Orthopaedic Hospital, Brockley Hill, Stanmore, HA7 4LP, UK

Introduction. Electric powered indoor/outdoor chairs have been prescribed for residents of North West London by Stanmore Specialist Wheelchair Service (SSWS) since 1997. **Objective.** To determine the use of the EPIOC service by those with cerebrovascular disorders (CVD). **Materials and methods.** All files were examined to ascertain: - primary reason for prescription of the EPIOC (Frank et al. 2000), other disabling symptoms/comorbidities, gender, age, and referring wheelchair service. All those with a primary or contributory diagnosis of CVD were examined. **Results.** 544 EPIOC users' files were examined and 43 had a diagnosis of a cerebrovascular event, of which only 32 was CVD the primary medical diagnosis leading to EPIOC prescription. There were 23 women mean age 54 (range 21-76, SD 15) and 20 men mean age 61 (range 38-78, SD 10) years. Eight were aged 70+ years, 15 aged 60-69, 14 aged 40-59 and 6 aged 20-39 years. Thirty two had a primary diagnosis of stroke, whilst three had a spinal cord injury, two were amputees, two had multiple sclerosis, one had a brainstem CVA, one had respectively cerebral palsy and spina bifida, rheumatoid arthritis and muscular dystrophy. Patients had been referred from 11 district wheelchair services with a total population of approximately 3 million people. Each wheelchair service thus had an average of 3.9 EPIOC users (range 1-9). **Conclusion.** EPIOCs are seldom prescribed for patients with cerebrovascular disease and the rate of prescription appears to vary with referring services. Comorbidities or prior major impairments appear to influence the prescription as does age. Although the age of this sample was much higher than the average age of an EPIOC user, EPIOCs were provided to younger patients with cerebrovascular disease. A large number of patients with CVD appear not to be given the participatory experiences in life that EPIOCs provide (Evans et al. 2007).

References

1. Evans, S., Frank, A., Neophytou, C., & De Souza, LH. 2007, "Older adults' use of, and satisfaction with, electric powered indoor /outdoor wheelchairs", *Age and ageing*, vol. 36, no. 4, pp. 431-435.
2. Frank, AO., Ward, JH., Orwell, NJ., McCullagh, C., & Belcher, M. 2000, "Introduction of the new NHS Electric Powered Indoor/outdoor Chair (EPIOC) service: benefits, risks and implications for prescribers", *Clin Rehabil*, vol. 14, no. December, pp. 665-673.

Experimental evaluation by gait analysis of a new type of flexible back brace in two cases of dystrophy

C. Smiderle, M. Scapin, S. Zacchini, E. Biotto, D. Pigatto
Dipartimento di Medicina Fisica e Riabilitazione, Ospedale S.Bassiano, Bassano del Grappa (Vicenza), Italy;

Materials and methods. Two young adult females suffering from facioscapulohumeral muscular dystrophy (FSHD and MD dystrophinopathy) and resulting severe scoliosis were treated by stabilization with a custom fitted flexible back brace ELASTiCARE, made of Fabrifoam. **Results.** Since standard dynamic gait analysis was not possible, given the fact that the two subjects could not walk independently, a new ad hoc protocol named "SPINE" was developed for evaluation. A special chair was used to measure gait analysis parameters while the patient was in a standardized sitting position. Measurements were made of changes in the 3D angular parameters, in the overall posture of the shoulders, and in the center of mass. **Conclusion.** To our knowledge, this is the first example of this type of study.

Gait analysis of the changes induced by the use of different braces in a girl affected by PCI

M. Scapin, C. Smiderle, D. Pigatto, S. Zacchini, E. Biotto
Dipartimento di Medicina Fisica e Riabilitazione, Ospedale S.Bassiano, Bassano del Grappa (VI), Italy

Introduction. The goal of this study was to assess the changes in walking patterns observed in a young girl affected by PCI following the use of different ankle foot orthosis. **Materials and methods.** To achieve the goal, gait analysis was used to evaluate the differences in cinematic and kinetic parameters for the subject, when rigid AFO braces, flexible AFO braces or shoes without any braces were used while walking. **Results.** Our results indicate a marked improvement of all perambulatory parameters when braces were used during walking, in comparison to the use of shoes only. **Conclusion.** In addition, careful analysis of the results showed that the use of flexible braces rather than rigid braces allowed for better perambulatory patterns with reduced energy expenditure

Sports and airway clearance techniques in children with cystic fibrosis

B. Almajan-Guta^{1,2}, V. Almajan-Guta³, C. Avram⁴
¹University "Politehnica" Timisoara
²National Cystic Fibrosis Center
³Special Care Center "Speranta" Timisoara
⁴West University Timisoara.

Introduction. Cystic fibrosis is a genetic, life-limiting disorder, which is influencing, except the brain, all internal organs (lungs, digestive tube, pancreas, liver, kidney, heart, reproductive organs). Physiotherapy management is a key element of care for people with cystic fibrosis. **Materials and methods.** The study was performed in the National Cystic Fibrosis Center Timisoara, Romania and at the University "Politehnica" Timisoara, during 2006–2008. Lot study consisted in 21 patients aged between 6 years–12 years. The specific objectives were to evaluate the compliance and the efficiency of physiotherapy and physical exercises as follows: stage I (months 0-6): airway clearance techniques and chest therapy; stage II (months 6-12): physical exercises; stage III (months 12-18): clearance techniques in combination with physical exercises. **Results.** Combined techniques (physical exercises associated with airway clearance techniques) proved to be superior (significant statistical difference $p < 0,05$), from efficiency and compliance: $FEF_{25-75\%}$: $Z = 4,05$, $p = 0,02$; FEV_1 : $Z = 4,11$, $p = 0,03$; FVC : $Z = 3,82$, $p = 0,03$. **Conclusion.** Physical exercise is an effective adjunct to airway clearance which enhances respiratory function, improve mucus expectoration. All patients should be encouraged to combine physical exercise with airway clearance techniques for better results and more compliance. A consequent and correct physiotherapy is the most important factor in the prevention of a chronic pulmonary infection and in the maintenance of a quality of life as close to normal as possible.

References

1. Button B, Chevallier J, Lannefors L, McIlwaine M, Oberwaldner B, Pryor J. The use of airway clearance techniques in the treatment of cystic fibrosis, *Journal of Cystic fibrosis*, 2008.
 2. Button B, Chevallier J, Lannefors L, McIlwaine M, Oberwaldner B, Pryor J. Physiotherapy in cystic fibrosis, *Journal of Cystic fibrosis*, 2009

3. Orenstein D, Nixon P, Ross E, Kaplan R. The quality of well being in cystic fibrosis, *Chest Journal*, 2010
 4. Tsui L-C.. The spectrum of cystic fibrosis mutations, *Tren Genet.*, 1992

Effects of physical activity on body mass index values in young adults of mladenovac

V. Maric¹, N. Radosavljevic¹, H. Colovic², M. Lazovic¹
¹Institute for Rehabilitation "Selters", Belgrade, Serbia
²Clinical Center of Nis, Nis, Serbia

Introduction. Body mass index (BMI) is established risk factor for heart disease. Its values are in strong correlation with overall lifestyle. Aim of this study is to point out distribution of BMI values regarding physical activity in young adults over period of 3 year. **Materials and methods.** We evaluated 390 young adults from Mladenovac municipality age of 20 years on first examination (first group). Second examination was done on same population over the period of 3 year when they were 23 year of age (second group). BMI was measured in the morning before meal, while physical activity was evaluated as activity measured by hours per week. **Results.** In the first age group individuals were physically active mostly between 5 and 6 hours per week with mean value for BMI of 22.44 ± 0.42 , while 3 years later they were less active mostly between 3 and 4 hours per week with average BMI of 24.75 ± 0.37 . **Conclusion.** Our results pointed out that there is decrease in physical activity in evaluated population with significant increase of BMI values. Therefore, healthier lifestyle habits should be promoted more frequently.

A diagnosis to remember

C. Bianchi, A. Betto, A. Pastorino, C. Stradella, G. Rovere
Department of Rehabilitation, ASL AL, Alexandria, Italy

Introduction. Falls represent one of the first causes of serious disabilities and hospitalization for aged patients (about one third of these patients still live at home and more than 50% are in hospitals or in old-age health structures). Falls can determine severe endangerments of autonomy as well as personal and familiar life quality problems. Closed cranial traumas, even of minimum entity, are a frequent consequence of the above. Anatomical changes, typical of ageing, facilitate the forming of chronic subdural hematomas. In patients suffering of more pathologies, including cognitive deterioration and conscience diseases (drowsiness, carelessness, incoherency in thoughts, apathy, general confusional state) are more marked than the focal or laterality signs and they can vary through the time. **Materials and methods.** 86-year-old woman hospitalized for rehabilitation on 12th day after the osteosynthesis operation for right femur fracture due to accidental fall with frontal bruise. CT encephalous resulted negative in Emergency Department tests. Anamnesis: arterial hypertension, 20 years ago tying paraclinoid aneurysm, recent endometrial adenocarcinoma diagnosis, slight cognitive deterioration. On 22nd day patient is able to ambulate using walking aid (FIM 80). Afterwards the woman had major difficulties in maintaining the achieved performances, talking and understanding faculties decreased (FIM 18). The patient is generally alert, slow, at intervals confused and disoriented, obeys comand, no focal neurological deficits are present. We must not forget the anamnestic cranial trauma (40 dd before) so we must proceed to perform a CT encephalous that reveals a bilateral chronic subdural haematoma. After few hours a craniotomy intervention is carried out in order to evacuate haematomas. Back in Department of Rehabilitation after 5 days (FIM 67) and she is discharged on 25th day using walking aid (FIM 87). **Conclusion.** Few neurological conditions are more frequently ignored in lifetime than the chronic subdural hematoma (M. S. J. Pathy).

References

Adams and Victor's Principles of Neurology. McGraw- Hill C. New York 2009

The "VIBORA" Study: Muscle Training using High Frequency Mechanical Vibrations as an Adjuvant in the Rehabilitation of Patients with Chronic Obstructive Pulmonary Disease (COPD)

A. Morales, E.Marco, A. Ramirez-Sarmiento, J. M^a Martínez-Llorens, M^a Pilar Ausin, R. Boza, A. Guillen, M. Orozco-Levi.
Physical Medicine and Rehabilitation Dept. Hospital del Mar. CIBER in Respiratory Diseases, Neumology Dept, Hospital del Mar. Group of Research in Injury, Immune Response and Lung Function (LIF), IMIM, Barcelona. Spain.

Introduction. Patients with COPD disclose several degrees of dyspnea and exercise limitation, which are directly associated with susceptibility to exacerbations and all-cause mortality. High-frequency mechanical vibration (HFMV) induces less ventilatory and cardiocirculatory overloads and can offer adjuvant alternatives to improve rehabilitation outcomes. As far as we know, there is no study that has evaluated its effectiveness in COPD patients. Aim: To evaluate the potential effects of a short HFMV-training-protocol on the peripheral muscles of COPD patients with severe dyspnea. **Materials and methods.** Patients with severe COPD (n=7, 75.7±6.0 years, FEV1=42.0±15.4%) were submitted to a HFMV protocol (frequency 35Hz, amplitude 10mm, 1 min/5 series/day, five days a week, during 6 weeks). Conventional pulmonary function tests, cardiopulmonary exercise test (CPET), strength of upper and lower limbs (assessed with handgrip dynamometer Jamar[®] and digital dynamometer, respectively) were performed prior and after the training period. Light and electron microscopy were used to assess size, proportion of type I and II fibers, capillary and mitochondrial density in muscle biopsies taken before and following the training. **Results.** All patients tolerated the training sessions and did not present any complication. HFMV associated with increases in both right and left quadriceps muscle strength (29.1±9.3 versus 32.7±9.7; and 26.1±5.2 versus 31.5±8.7 kg, respectively). A potential transfer effect was found on the dominant-hand (35.0±5.0 versus 38.5±5.0 kg). Significant improvements were observed in the exertional leg discomfort (in CPET, visual analogue scale 7.0±3.5 versus 5.3±4.0). **Conclusion.** HFMV is a safe adjuvant alternative to lower limb muscle training in severe COPD patients with exertional dyspnea. Technical complexity is lacking and is found to be safe in terms of cardiovascular, muscle or skeletal systems. HFMV could be an attractive modality to be included at larger scales in Cardiopulmonary Rehabilitation settings, as a useful adjunct for patients with low tolerance to the overall effort.

Evolutive profile after proximal femur fracture in old subjects

A. Souayah¹, S. Ben salah³, W. Herchi¹, H. Rahali¹, I. Miri², S. Ghorbel², S. Lebib², C. Dziri²

¹Military Hospital of Tunis, Tunisia

²National Mohamed Kassab Institute of Orthopaedics, Tunisia

³Community Clinic of Ezzabrouni, Tunisia

Introduction. Proximal femur fracture is a major cause of morbidity in older people and its impact both on the individual and on the society. The purpose of this work is to estimate the functional status of old person's population having a proximal femur fracture. **Materials and methods.** The study population consisted of all patients older than 65 years hospitalized for rehabilitation after surgical repair of proximal femur fracture in trauma unit of the National Mohamed Kassab Institute of Orthopaedics. We examine medical state before fracture, type of fracture, type of surgery, walking performance after surgery. **Results.** We examined 30 patients (21 women and 9 men) with a mean age of 78 years, 66% had a good general condition, and 87% had comorbid disease. Different location fracture was observed 9 had Subcapital fracture (4 Garden II, 5 Garden IV) and 21 had intertrochanter fracture. 29 were treated surgically, 23 had nail fixation and 5 had joint replacement. 19 had a rehabilitation program 6 were walking alone, 13 with technical aid. 4 were bedridden and 6 were dead. **Conclusion.** Proximal femur fracture is common in the elderly population. Surgical repair followed by rehabilitation is the treatment of choice. The aim of the rehabilitation process is to enable elderly patients to return as closely as possible to their previous functional status.

References

Devora Lieberman, David Lieberman. Arch Phys Med Rehabil Vol 83, October 2002.

Psychological profile of the chronic low back pain before and after rehabilitation program

A. Souayah¹, W. Herchi¹, H. Rahali¹, I. Miri², S. Ghorbel², S. Lebib², C. Dziri²

¹Military Hospital of Tunis, Tunisia

²National Mohamed Kassab Institute of Orthopaedics, Tunisia

Introduction. Chronic low back pain is a health care problem with a considerable importance. The importance of psychological

factors in chronic low back pain should not be underestimated. We propose in this study to focus on the effectiveness of rehabilitation in the management of the psychological component. **Materials and methods.** Retrospective study concerning 30 patients with chronic low back pain. All patients had evaluation of pain intensity with VAS, functional impairment with Quebec Back Pain Disability Scale and psychological component with HAD scale. **Results.** The study included 26 men and 44 women with a mean age of 41 years. Initial HAD average was 14 for anxiety and 6 for depression. HAD score varied with sex, duration of back pain, pain intensity and especially with functional impairment. Improved HAD was noted in 92 %, two patients have worsened their HAD and 3 kept the same. Lower was Quebec Back Pain Disability Scale best will be improvement of HAD. **Conclusion.** Rehabilitation can reduce chronic pain intensity and disability, improve functional capacity and limit the psychological impact of LBP. However, this type of program requires high levels of motivation and regular supervision from patients.

References

Elizabeth M. Altmaier¹, Thomas R. Lehmann d, Daniel W. Pain, 49 (1992) 329-335 329.

Comparison of two instrumental muscle strength measurement methods in the lower extremity in children with CP

M. Bonikowski¹, A. Czernuszenko¹, J. Jagiello¹, E. Żak^{1,2}

¹Mazovian Neuropsychiatric and Rehabilitation Center for Children and Youth, Zagorze n. Warsaw, Poland

²Medical University of Silesia, Katowice, Poland

Introduction. The aim of this research was comparison of two methods of instrumental measurement of voluntary isometric muscle force: dynamometer measurement in standard positions with measurement with a drive gait orthosis(DGO). Both methods were standardized in previous studies (1,2). **Materials and methods.** The study population consisted of 17 children(12m,15f) with CP-spastic diplegia aged from 6-14 years(mean 10,75)GMFCS. Voluntary isometric muscle forces 3 groups of muscles:hip,knee flexors and knee extensions were measured with MicroFet(Biometrics) dynamometric device.All measurements were performed in standard positions.The same muscle groups were measured with DGO.Patients were lifted above the treadmill to position specific for control mode with preset fixed joint angles(hip 30°,knee 45° flexion).Patients were asked to perform either a flexion or extension movement in hip or knee joint. **Results.** The results measured with DGO/MicroFET were as following:hip flexors SD=14,85±6,62/ 79,30±32,4 MED=12,75/75,4 knee flexors SD=7,92±5,45/44±22,33 MED=6,4/38,knee extensions SD=9,90±7,60/ 99,45±40,74 MED=8,3/96,75 .There was significant lack of correlation between knee flexors measured with DGO and MicroFet. **Conclusion.** Both methods can be used to measure the muscle force.Correlation is noticeable only in knee flexion measurement.The reason for no correlation in other measurements could be in different position of patient during examinations.More research is needed,on a larger groups and healthy persons.

References

Hsieh C-Y,Philips R.B.Reliabilty of manual muscle testing with a computerized dynamometer.J. Manipul.Physiol.Ther.1990;13;72-80
M.Bolliger, R.Banz, V.Dietz, L.Lunenburger—"Standardized voluntary force measurement in lower extremity rehabilitation robot" Journal of Neuroengineering and Rehabilitation 2008,5;23

Case report: The effects of auditory rhythms in a patient with persisting gait disorder six months post brain injury

S.L. Rossetti², K. Molatore¹, C. Foti³

¹Neurorehabilitation Medicine Ospedale Generale di zona "Moriggia-Pelascini", Gravedona-Italy

²Phd In Advanced Technology In Rehabilitation Medicine Tor Vergata University Rome-Italy

³Department of Physical and Rehabilitation Medicine Tor Vergata University Rome-Italy

Background. Sequential movements in patients with post brain injury might be improved by the effects of external rhythmic cues. Patient with TBI often results in functional deficits in posture, stance and gait. The acoustic signals can shorten the reaction time of reflex and voluntary movement and can increase physiological muscle acti-

vity during H reflex stimulation. The auditory rhythms may facilitate the development of effective motor programs by organizing movement in anticipatory time, space and force pattern therefore making movement trajectories more fluent, smooth and better timed. **Case report.** A 70 years old patient, female, with persisting gait disorder and right hemiparesis six months post brain injury became gait training program with auditory stimulation rhythms. The patient was characterized by hypertone to wrist and ankle right and severe proprioceptive disturbances with robotic gait and low balance. Sessions lasted 1 hour biweekly basis for a period of 3 months at department of neurorehabilitation "Moriggia Pelascini" hospital. During the first session was evaluated the patient through the use of rating scales. At the end of the PRP the patient was evaluated again. **Outcome measures comprised.** Modified Ashworth Scale, Tinetti Gait Evaluation, Gait assessment rating scale, Time Walking Test, Barthel index. Video recording during the gait with and without music. **Conclusion.** The patient in the last assessment has more control of her body, including the best perception of the right and hypertone reduction with fluent gait in better time and symmetry of ground-reaction forces and functional performance. The music therapy is an effective therapeutic strategy, on motor, affective, and behavioral functions complementing exercise therapy for rehabilitation multifunctional.

References

- Rossignol S, Melvill Jones G. Audio-spinal influences in man studied by the H-reflex and its possible role in rhythmic movement synchronized to sound. *Electroencephal. Clin. Neurophysiol.* 1976;41:83-92
- Prassas SG, Thaut MH, McIntosh GC, Rice RR. 1997. Effect of auditory rhythmic cuing on gait kinematic parameters in hemiparetic stroke patients. *Gait Posture*, in press.
- Neurophysiology and neurobiology of the musical experience, Boso M, Politi P, Barale F, Enzo E. *Funct Neurol.* 2006 Oct-Dec;21(4):187-91

PARAVERTEBRAL INFILTRATIONS OR PHYSICAL ANALGESIA FOR TREATMENT OF PERIPHERAL NEUROPATHIC PAIN: FROM DISCONNECTION TO COMBINATION

I.B. Koleva¹, R.D. Yoshinov²

¹Department of Physical Medicine, Rehabilitation, Ergotherapy and Sports at the Medical University of Pleven, Bulgaria

²Laboratory of Telematics at the Bulgarian Academy of Sciences, Sofia, Bulgaria

Introduction. Different drugs and physical modalities are applied for treatment of neuropathic pain. **Objective.** Comparative evaluation of drug, physical and combined analgesia on radiculopathy. **Materials and methods.** During last years a total of 195 patients are investigated, randomized to five treatment groups of 39 each one. All patients gave written informed consent before undergoing any examination or study procedure. Groups 1 & 2 received only drug therapy – paravertebral infiltrations with vitamins of B group, local anesthetic, and: in group 1 + corticosteroid, in group 2 + non-steroidal anti-inflammatory drug. Patients of group 3 received only physical modalities (transcutaneous electroneurostimulation, magnetic field, exercises, massages, sea lye compresses). In groups 4 & 5 we combined drug and physical therapy: in group 4 – programs 1 + 3, in group 5 – programs 2 + 3. Comparative analysis of results shows a statistically significant improvement of pain relief (Visual analogue scale, dolorimetry), vibration sense, thermosensibility, nerve irritability and conductivity (electroneurography), depression and anxiety (Zung scales). We observed best results in groups 4 and 5. **Conclusion.** Drug therapy is efficient but with short duration. Physical analgesia initiates its effect slowly, but its results are stable. Best efficacy was observed in case of combination of medication with physical modalities – in the beginning due to drug infiltrations, toward the moment of active "input" of physical modalities. We exposed our own concepts on mechanisms of physical analgesia. We recommend the complex program for treatment of the radicular pain.

MEDICAL REHABILITATION AND OCCUPATIONAL (ERGO) THERAPY - AN ADJUVANT MEDICAL SPECIALTY UNDER THE SUPERVISION OF PRM DOCTORS: THE BULGARIAN WAY

I.B. Koleva¹, T. Troev², R.D. Yoshinov³

¹Department of Physical Medicine, Rehabilitation, Ergotherapy and Sport at the Medical University of Pleven, Bulgaria

²Clinic of Physiotherapy and Rehabilitation, Military Medical Academy, Sofia, Bulgaria

³Laboratory of Telematics at the Bulgarian Academy of Sciences, Sofia, Bulgaria

The review explores physiological and psychological bases of the human vital need (as an imperative part of Man's nature): the need to work and to be occupied however. Authors suggest a personal opinion about effective use of neuro-muscular and intellectual capacities, and individual productivity and creativity, like a determinant factor of the satisfaction of the effectuated work. Since the academic year 2004/2005 in two Bulgarian Medical Universities (Sofia and Pleven) the education in "Medical Rehabilitation and Ergotherapy (MR&ET)" began. Authors explain difficulties, obstacles and the atmosphere of controversy in the process of development of the medical specialty MR&ET. We give details about the Plan and Programmes of the specialty MR&ET like an adjuvant medical specialty; the graduates of which must to work in the rehabilitation practice under the supervision of doctors – specialists of Physical and Rehabilitation Medicine (PRM). We give a detailed evaluation of the impact of ergotherapy (occupational therapy) for stimulation of functional recovery and improvement of autonomy, respectively health-related quality of life in more than 1000 patients with invalidating socially important neurological conditions: post-stroke hemiparesis, multiple sclerosis, Parkinsonism; peripheral paresis. On the base of our own experience, some perspectives in the development of the rehabilitation in Bulgaria are strained.

REHABILITATIVE APPROACH TO THE 'DROPPED HEAD SYNDROME' IN ALS

C. Berlingieri, S Lampa, G. Marcassa, F. Piccione, E. Cosentino, A. Merico
I.R.C.C.S. San Camillo, Lido, Venice, Italy

Introduction. The Dropped Head Syndrome (DHS) is characterized by a deficit of the cervical muscles, and it has been described in isolated cases of the Amyotrophic Lateral Sclerosis (ALS). The consequences regard deglutition, respiration and the possibility to look forward. In literature there are no suggestions for rehabilitative interventions, except the use of an orthopedic collar. Our objective was to evaluate the efficiency of the rehabilitative treatment and its consequences on QoL. **Materials and methods.** 3 patients diagnosed with ALS and bulbar signs have been studied (3 men aged 49, 57, and 43; ALS-FRSr scores of 30, 28, and 29; the bulbar sub-scores of 6, 2, 4). The angle of inclination of the cervical part was about 30° with a hypotrophy and a deficit particularly of the extensor muscles (the superior trapezius with a MRC of 1-2, the SCM with a MRC of 2-3). These evaluations, including a life quality scale (SF36), were executed at the beginning and at the end of the study. The patients underwent a neurorehabilitative treatment in combination with a non-conventional method; kinesiotaping, which main therapeutic principle is biomechanical; it helped the active muscle-work in the deficit areas, improving the proprioceptive stimuli and favouring auto-correction. **Results.** At the conclusion of the study all three patients have shown a reduction of the angle of inclination of the cervical part as well as a reduction of the deficit of the extensor muscles and an improvement of QoL score. **Conclusion.** Our pilot study seems to indicate that an intense rehabilitative treatment integrated with kinesiotaping improves the DHS, allowing an optimized respiratory and logopaedic approach. All three patients had bulbar exordium that seems to include Dropped Head Syndrome; a hypothesis that is anatomy-physiology based, since the muscles involved (the superior trapezius, the SCM and partly the elevator scapulae muscle) are innervated by the accessory nerve.

References

- Gourie-Devi M et al., Early or late appearance of "dropped head syndrome" in amyotrophic lateral sclerosis, *J Neurol Neurosurg Psy.* 2003 May;74(5):683-6.

PARAVERTEBRAL INFILTRATIONS OR PHYSICAL ANALGESIA FOR TREATMENT OF PERIPHERAL NEUROPATHIC PAIN: FROM DISCONNECTION TO COMBINATION

I.B. Koleva¹, R.D. Yoshinov²

¹Department of Physical Medicine, Rehabilitation, Ergotherapy and Sports at the Medical University of Pleven – Bulgaria

²Laboratory of Telematics at the Bulgarian Academy of Sciences – Sofia, Bulgaria

Introduction. Different drugs and physical modalities are applied for treatment of neuropathic pain. **Objective.** Comparative evaluation of drug, physical and combined analgesia on radiculopathy. **Materials and methods.** During last years a total of 195 patients are investigated, randomized to five treatment groups of 39 each one. All

patients gave written informed consent before undergoing any examination or study procedure. Groups 1 & 2 received only drug therapy – paravertebral infiltrations with vitamins of B group, local anesthetic, and: in group 1 + corticosteroid, in group 2 + non-steroidal anti-inflammatory drug. Patients of group 3 received only physical modalities (transcutaneous electroneurostimulation, magnetic field, exercises, massages, sea lye compresses). In groups 4 & 5 we combined drug and physical therapy: in group 4 – programs 1 + 3, in group 5 – programs 2 + 3. Comparative analysis of results shows a statistically significant improvement of pain relief (Visual analogue scale, dolorimetry), vibration sense, thermosensibility, nerve irritability and conductivity (electroneurography), depression and anxiety (Zung scales). We observed best results in groups 4 and 5. **Conclusion.** Drug therapy is efficient but with short duration. Physical analgesia initiates its effect slowly, but its results are stable. Best efficacy was observed in case of combination of medication with physical modalities – in the beginning due to drug infiltrations, toward the moment of active “input” of physical modalities. We exposed our own concepts on mechanisms of physical analgesia. We recommend the complex program for treatment of the radicular pain.

Body fatness influence on treatment effects in patients with subacute low back pain

M. Terek, M. Zlatkovic-Svenda, N. Djurovic, G. Radunovic
Institute of Rheumatology, Belgrade, Serbia

Introduction. The aim of the study was to assess the body fatness influence on the effect of treatment in patients with subacute low back pain. **Materials and methods.** Prospective study included 73 out-patients (14 male and 59 female), aged 54,71 ±12,72 years with low back pain. Patients were treated in Institute of Rheumatology, Belgrade, year 2008/09. The amount of body fat was demonstrated as body mass index (BMI), as recommended by the World Health Organisation. All patients underwent the same (physical therapy and medication) two-weeks therapy. The level of pain was measured on Visual Analogue Scale (VAS) and the functional status was measured with Quebec Back Pain Disability Score (QBPDS). All measurements were done before and after the specific treatment. Analyses were carried out using SPSS 16.0 (descriptive methods: mean, standard deviation and analytic methods: Wilcoxon and Mann Whitney test). **Results.** According to BMI, patients were divided into two groups: Group A - 17 (23,29%) patients with normal weight (mean BMI 22,95) and Group B - 56 (76,71%) overweighted patients (mean BMI 35,02). Mean VAS was 71,4 before and 29,05 after the treatment in the Group A and 70,2 before and 36,6 after the treatment in the Group B (p=0,000 and p=0,002 respectively). Mean QBPDS was 61,9 before and 36,41 after the treatment in the Group A and 60,10 before and 34,82 after the treatment in the Group B (both p=0,000). Comparing the two groups after the treatment, there were no differences concerning pain level (p=0,146) and functional status (p=0,123). **Conclusion.** The level of pain was decreased and functional status was improved in both groups after the treatment. There was no differente response on treatment in the investigated groups of patients with subacute low back pain.

References

1. Mohammed Halalshah et al. The association of Low Back Pain with Obesity in One of the Primary Health Care Centers. Bahrain Med Bull, 2000;22(1).

The Evaluation of The Effects of Therapeutic Exercise on Lumbar and Pelvic Pain in Pregnant Women of Isfahan City

Sayed Mohsen Mirbod, Fateme Mortazi, Mariam Zarin Moghadam
Rehabilitation School , Isfahan University of Medical Science

Introduction. According to the studies from 1999 to 2008, 50% of the pregnant women suffer from Low back pain. Decreasing in low back pain by exercise therapy is unknown because the studies are inconclusive. the aim of the presence investigation is effect of the exercise therapy in decrease low back pain & pelvic pain in pregnancy in Isfahan city. **Materials and methods.** This is control trial study. Around 58 pregnant women 3 to 7 month of pregnancy aging between 20 to 35, being visited in our obstetric and Gynecologic Clinic that suffer from low back pain & pelvic pain. They considered in 2 group accidentally. First group (n=29) treated the exercise and second group(n=29) was without any treatment. All of the patients completed the first questioner (number 1) that consists of the information about

low back pain & ability of daily activity. One month later all of them completed the second questioner (number 2). **Results.** The data were analyzed by SPSS 14 software. We found that there was a significant difference between treatment group & controlling group in all of the daily activity (P<0/05). Also we detect a significant difference decrease in pelvic & low back pain in treatment group . But we don't detect the significant difference in controlling group. (P<0/05). **Conclusion.** Exercise therapy can decrease the pelvic & Low back pain during pregnancy and increase the quality of the pregnant life.

References

1. Norases Fs, ShimoAK, Lopes MH. Low back pain during gestation. Rev lat Am En fermagem. 2006 Jul- Aug; 14 (4):620-4
2. Mogrenl. Perceived health. Sick leave, psychosocial situation, and sexual lifein women with low- back pain and pelvic painduring pregnancy. Acta obstet aynecol scand scand. 2006; 85(6):647-56.
3. Haugland KS, Rasmussen S, Daltveit AK. Group intervention for women with pelvic girdle pain in pregnancy. A randomized controlled trial. Acta obstet aynecol scand 2006; 85(11):1320-6
4. Pennick VE, young G. interventions for percneting and treating pelivc and back pain-in pregnancy. Cochrance Database Syst Rev. 2007 Aprl 8; (2)CKooll39

The evaluation of the effectiveness of educational booklet on reduction of neck pain among dentists of Isfahan.

Abdolkarim Karimi, Soghra Jokar, Hurie Kamaledini, Faride Mozafari
Rehabilitation School, Isfahan University of Medical Science

Introduction. Neck pain is a common musculoskeletal disorder among dentists due to their posture and positioning during their profession. The effectiveness of educational booklet is not clarified in articles; in particular, this effectiveness is not investigated in Iranian population up to the present time. **Materials and methods.** An experimental prospective design selected for the study. A sample of 30 dentists with neck pain recruited consecutively to the study. A prepared booklet including neck care and neck exercises offered to the subjects to practice regularly. The information and data collected through questionnaire and checklist. Neck pain and Disability Scale (NPDS) was used as an outcome measure. Repeated measure ANOVA (RMANOVA) used for analyzing data at follow up. **Results.** The analysis of data indicated that the educational booklet reduced the pain and disability after 4 weeks (P<0/001) and 6 weeks (P<0/001). **Conclusion.** The results of study imply that education through booklet is effective on reduction of neck pain and disability among dentists. The results concur with the studies which show the positive effects of educational booklet on patients with back pain.

Cardio-vascular functions and physical endurance

Lazovic Milica
Institut of Rehabilitation, Belgrade, Sokobanjska 17, Serbia

Introduction. The cardiovascular system function is considered to be one of the most important functions of the human body. The primary function of the heart is to impart energy to blood in order to generate and sustain an arterial blood pressure necessary to provide adequate perfusion of organs. Physical endurance is the time span between the beginning of physical activity by an individual and the termination because of exhaustion. Cardiovascular endurance (CE) is the ability of the heart, lungs and blood vessels to deliver oxygen to working muscles and tissues, as well as the ability of those muscles and tissues to utilize that oxygen. CE is also frequently called cardio-respiratory endurance, cardiovascular fitness, aerobic capacity, aerobic fitness or is sometimes more broadly termed “endurance” - although endurance may also refer to the ability of the muscle to do repeated work without fatigue. It is also one of the five components of physical fitness. Cardiovascular endurance can be measured using a number of formal clinical methods including: Vo2Max Test, Ventilatory Threshold or Lactate Threshold Test, Graded Exercise Tests, Exercise Electrocardiography. Non-clinical tests for cardiovascular endurance: Resting Heart Rate, Cooper Test, Estimated Vo2Max. Borg test is also very useful as practical test of perceived exertion by accout a persons fatigue level. **Conclusion.** Like training your muscles, continuously challenging your cardiovascular system with increased levels of aerobic activity will generally result in gains in cardiovascular endurance and fitness. This can be duration running, biking, swimming, cardio at the gym, or even higher-intensity activities like sprinting or interval training, which have been shown to increase VO₂Max.

References

1. Pollock ML, et al. Resistance exercise in Individuals with and without Cardiovascular disease: Benefits Rationale, Safety, and Prescription an Advisory from the Committee on Exercise, Rehabilitation, American Heart Association. *Circulation* 2000; 101:828-33.
2. Meka N, et al. Endurance exercise and resistance training in cardiovascular disease. *Therapeutic Advances in Cardiovascular Disease*, 2008; 2(2):115-21.

The lateral fracture of femur, news in the field of rehabilitation: our experience

G.E. Fata¹, L. Di Bisceglie¹, G. Di Bisceglie²

¹Istituti Ospedalieri Don Uva-Bisceglie, U.O.C. di Medicina Fisica e Riabilitativa

²Università degli Studi La Sapienza, Facoltà di Ingegneria Biomedica, Roma

Introduction. To optimize the path from severe osteoporosis fracture to functional recovery, was designed a path that uses TPTD to accelerate the rehabilitation process. **Materials and methods.** The osteoinductor drug used is "FORSTEO" 20 mcgr/80 mcl. with Ca and Vit D. on lateral fractures of the femur due to severe osteoporosis. Eligible patients with lateral fracture of the femur. At admission in Orthopedics, blood chemistry tests on bone metabolism, X rays back lumbar spine in 2P, osteosynthesis, discharge showing the loading and prescription of TPTD, Ca and Vit D. At admission in U.O. of Physical and Rehabilitation Medicine, administration of evaluative scales (Barthel Index, ADL, IADL, assessing muscle strength, Functional Ambulation Category, VAS, Qualeffo, Cognitive Tests, anxiety and depression rating scales). Then it is started a rehabilitation program of close steps for the treated group and of natural circuit for that of control. **Results.** Integrated treatment involves reducing the time for healing and improving the quality of patients' life. The early granting of loading promotes functional recovery, reducing the time spent in hospital with a favourable outcome. **Conclusion.** Preliminary results show <% contralateral femur fracture at 12 and 18 months, reduced level of results and % of death in the first year, quicker reintegration, <costs for rehabilitation, <% of Disability.

References

1. Orwoll E, Scheele WH, Paul S et al. The effect of teriparatide [human parathyroid hormone (1-34)]. *J Bone Miner Res* 2003; 18: 9-17
2. Gold D, Lyles K. Fractures: Effects on Quality of Life. *The Aging Skeleton* 1999; 32:373-5.

ICARS project: Italy-Jordan cooperation in rehabilitation sciences

G. Della Bella, T. Sciarra, C. Foti

PHD in "Advanced Technology in Rehabilitation Medicine", Tor Vergata University, Rome, Italy

Introduction. The Italian-Jordanian Cooperation project to the Strengthening of the Faculty of Rehabilitation Sciences at the University of Jordan (ICARS Project) was officially started on November 16th 2007. A relevant education component included the training of nine Jordanian experts for a period of 18 months at Tor Vergata University in Rome and at "G. D'Annunzio" University in Chieti, and a whole series of seminars, lectures and courses held by Italian professors at Jordan University in Amman. **Materials and methods.** This project aims at finding specialized personnel through the training of 130 students in Jordan, and up-scaling the professional skills in Italy for 9 Jordan experts of O&P and PT sectors. An agreement was signed between the Italian and Jordan Governments to support the Faculty of Rehabilitation Sciences at the University of Jordan. The Italian side provides a total amount of Euro 3.9 million. The Italian support would contribute in providing both the needed equipment for the Faculty of Rehabilitation Sciences, and the secondment of professional Italian professors in the fields of Physical and Rehabilitation Medicine. The direct beneficiaries are the students at the Faculty of Rehabilitation Sciences in Amman. **Results.** The project is ongoing and in 2010 will also be achieved the last phase of the reinforcement of the Faculty. The concluding phase of the project is to supply the PT and O&P laboratories at the Jordan University with proper and technologically advance equipment. This will allow Jordanian professors and students to practice the skills and techniques learnt through the project. **Conclusion.** Italian-Jordan cooperation (ICARS) project represents a wide and complete educational model for enhancing the capacities of the rehabilitation sciences in a developing country.

Perceived disadvantage caused by lower back pain

K. Mattila, M. Leino, C. Suominen, R. Tuominen

Department of public health, University of Turku, Finland.

Objective. To evaluate the disadvantages caused by lower back pain (LBP) in work, housework and leisure time activities. **Materials and methods.** The data was based on a systematic sampling of physicians' referrals due to LBP to the outpatient clinic of Physical and Rehabilitation Medicine in Turku University Hospital. Trained interviewer conducted telephone interviews among 39 consecutive referred patients. The patients were asked to assess how well they performed in work, in housework and in leisure time activities with LBP. Also they gave estimates on how well they would expect to perform in all of these activities, given that they did not have LBP. All assessments were done using VAS-typed scales with endpoints 0) do not perform at all and 100) performs without any problems. The differences in perceived scores for performance with and without LBP were used to depict the level of disadvantage. Socio-demographic and work-related background data were solicited. All subjects participated. **Results.** On average, the overall disadvantage score was 25.3. Men perceived significantly ($p < 0.05$) more disadvantage (28.9) due to LBP than women (24.0). Among women the most disadvantage was considered in housework (31.2) and among men in leisure time activities (35.5). Because of LBP 32 out of the 39 subjects had been forced to give up one or more leisure time activities. On average the number of leisure time activities given up was 2.1 and those reduced 1.2. Men had given up or reduced more often sports related activities than women. Ninety-five percent of the subject had received assistance in housework, women 190 minutes and men 240 minutes per week. Among those who work, 81.0 % of women reported to perform well in work, and 42.9 % of men. **Conclusion.** When estimating the overall burden of LBP the measures of work related productivity losses should be complemented with measures of performance in housework and limitations in leisure time activities.

Effects of FES Cycling in the Late Recovery of Chronic Patients with Spinal Cor Injury

E. Yasar, B. Yilmaz, A.S. Goktepe

Gulbane Military Medical Academy, Physical Medicine and Rehabilitation Department, TAF Rehabilitation Center

Introduction. The aim of our study is to display the effects of this system on poor ambulated chronic spinal cord injured patients with objective activity assessments of walking. **Materials and Methods.** In this study, the functional electrical stimulation (FES) assisted bicycle was applied to the ambulated (at least 10 meter independently, or with the assistance of a cane or walker, but no hip-knee-ankle-foot orthosis) patients with incomplete lesion (ASIA C or D) from any injury at least 2 years earlier. The study subjects were asked to undergo a 60 minute FES assisted bicycling session three times/week for a period of 16 weeks. The assessments were done at the beginning of the study and, 3rd and 6th months. Spasticity level (Modified Ashworth Scale), motor score, Functional Independence Measurement (FIM), injury level, SF-36, the assessment of walking with 3D Motional Analysis, the measurement of energy expenditure with cardiopulmonary exercise test device, and the assessment of knee proprioception (repositioning error) with isokinetic exercise test device were the assessment parameters of our study. **Results.** 10 patients with SCI patients with a mean age 37.50 ± 13.38 years were included. 5 of them were tetraplegic. There were statistically significant improvements in motor scores, FIM scores, physical function scores of SF - 36, and energy expenditure values ($p < 0.05$). Although a decrease in repositioning errors with the knee movements and improvements in gait parameters obtained from 3D Motional Analysis were observed, these improvements were not statistically significant ($p > 0.05$). When the spasticity values decreased in the first 3 months period, EMG amplitudes of rectus and hamstring muscles also lessened. They increased in the second 3 months period. **Conclusion.** FES cycling has good effects and may be useful on the ambulation levels of the patients with chronic SCI. It may contribute functional recovery in the late period of SCI. **Notification.** This study was supported and sponsored by The Scientific and Technological Research Council of Turkey

Nosocomial Urinary Tract Infections in A Neurologic Rehabilitation Center

B. Yilmaz, F. Yavuz, E. Yasar

GMMA, Dept. of PM&R, TAF Rehabilitation Center

Introduction. In rehabilitation units, patients with a spinal cord injury (SCI) and brain injury are particularly prone to nosocomial urinary tract infections (UTIs) due to some risk factors. Urinary catheterization was a well-established risk factor for nosocomial urinary tract infections in spinal cord injured patients. *E.coli* and organisms such as species of *Proteus*, *Klebsiella*, *Pseudomonas*, *Serratia* and *Enterococci* are relatively more common in patients with catheter-associated UTI. Frequent exposure to antibiotics increases the risk of infection with antibiotic-resistant organisms, further complicating the treatment of UTIs. The objective of this retrospective study are to describe a two-year data of nosocomial urinary tract infection from our rehabilitation center. **Materials and methods.** We performed a descriptive, retrospective analysis of nosocomial urinary tract infections between 2007-2009. We compared that pathogens of nosocomial urinary tract infection between brain and spinal cord injured patients. Also we compared that pathogens of nosocomial urinary tract infection between acute care unit and spinal cord injuries unit. **Results.** 324 patients were included in this study. Of these, 276 had SCI hospitalized in either acute care unit and spinal cord injuries unit and 48 had brain injury. Among the nosocomial UTIs, 189 infections (%58.3) were asymptomatic bacteriuria (ASB) and 135 infections (%41.6) were symptomatic urinary tract infection(SUTI). The comparison between acute care unit and spinal cord injuries unit in terms of uropathogens was statistically different ($p<0.05$) Also the comparison between spinal cord injured and brain injured patients in terms of uropathogens was statistically different ($p<0.05$). Urinary catheterization was significantly more frequent in spinal cord injured patients than brain injured patients. **Conclusion.** The high rate of infection is not only due to SCI but to the patient's personal hygiene and bladder drainage methods. Therefore the specific care and prevention programmes must be applied and the use of indwelling catheter should be removed as soon as possible with intermittent catheter. Also frequent treatment of ASB can lead to bacterial resistance. So that the restricted use of antibiotics are required to prevent development of antibiotic resistance.

Gait and Energy Expenditure Analysis in Decision about Using WalkAide System in a Stroke Patient

Ridvan Alaca, Birol Balaban, E. Yasar

GMMA, Dept. of PM&R, TAF Rehabilitation Center

Introduction. We aimed in this case report to assess the effectiveness of WalkAide system on gait impairments and energy expenditure in a case with chronic stroke. **Materials and methods.** A female patient with chronic hemiplegia was reported. She was admitted to our stroke clinic with the complaint of walking difficulty, and she was not pleased to use a plastic leaf-spring AFO because of cosmetic and tolerating problems. Her gastrocnemius muscle showed MAS (Modified Ashworth Scale) 1+ spasticity. We planned for her a WalkAide system which was a peroneal FES via a neuroprosthesis. She underwent gait analysis and energy consumption studies with and without WalkAide system. The Vicon 512 Motion analysis system was used for gait analysis. Walking energy expenditure measurements were done with breath by breath method using an open-circuit indirect calorimeter (Vmax 29c, Sensormedics, USA). **Results.** WalkAide application, as compared with the barefoot condition improved walking speed, stride length and single support time. Double support time was decreased significantly with it and no change in cadance. Ankle dorsiflexion at initial contact, midstance and midswing showed significant increase. There was no significant change in knee flexion at initial contact, maximum knee extension at stance and maximum knee flexion at swing. The oxygen consumption was significantly reduced during walking with WalkAide system. **Conclusion.** WalkAide system may be useful in controlling dynamic equinus deformity and reducing the energy expenditure of gait in stroke patients. It will be better to evaluate gait and energy expenditure analysis in stroke patients, before decision to use WalkAide in this patient group. Because this systems are expensive applications.

Follow-up of breast cancer patients after negative sentinel node biopsy

H. Fernandes, C. Neri, P. Silva, Â. Rodrigues, J. Abreu de Sousa, Otilia Romano

Portuguese Institute of Oncology, Porto

Introduction. Sentinel lymph node biopsy (SLNB) is a surgical procedure that tries to prevent lymph node dissection and its consequences. In breast cancer, this technique has the potential to avoid the standard axillary surgery, but it also has some complications. The purpose of this study was to investigate the patients that had a negative SLNB in their breast cancer surgery. **Materials and methods.** In our institution, in the first three months of 2008 there were 106 patients with breast cancer surgery and negative axillary SLNB. In the one year follow-up, 87 patients appeared and their shoulder mobility and upper limb volume were assessed. **Results.** We found relevant asymmetric circumferential limb girth and, specially, decreased range of shoulder motion in some patients. This pathologic findings were associated with some surgical procedures and therapeutic options and also with wound complications and greater body mass index. The statistical analyses were performed using SPSS software. **Conclusion.** All the patients with breast cancer that underwent a negative axillary sentinel lymph node biopsy should be periodically examined and educated. There are some patients that need specific treatment of their shoulder limitation and upper limb swelling.

References

- Mabry H., Giuliano A.E.. Sentinel node mapping for breast cancer: progress to date and prospects for the future. *Surg Oncol Clin N Am* 16 (2007): 55-70.
 Wilke L.G., et al. Surgical complications associated with sentinel lymph node biopsy: results from a prospective international cooperative group trial. *Ann Surg Oncol*, 2006; 13(4): 491-500.
 Stout Gergich N.L., et al. Preoperative assessment enables the early diagnosis and successful treatment of lymphedema. *Cancer*, 2008 Jun 15; 112(12): 2809-19.

Psychometric characteristics of duruo hand index in patients with traumatic hand injuries

Erçalık Tülay, Şahin Füsün, Erçalık Cem, Doğu Beril, Yücel Serap, Kuran Banu

Istanbul Şişli Etfal Training and Research Hospital Physical Therapy and Rehabilitation

Introduction. To assess in patients with traumatic hand injuries reliability, validity, and sensitivity to change of Duruo Hand Index (DHI) which has been developed as a self-report questionnaire for the evaluation of activity limitation in rheumatoid arthritis. **Materials and methods.** Sixty-five patients older than 16 years of age who underwent surgical intervention after flexor tendon injuries were enrolled in this prospective validation study. Initial evaluations of all patients were performed after the 3rd postoperative week. For test-retest reliability, of DHI the patients were evaluated after 24 hours from the initial evaluation and also 8 weeks later, DHI was fulfilled for the evaluation of sensitivity to change, internal consistency, and test-retest reliability DHI, were assessed by Chronbach's alpha, and intraclass correlation coefficient (ICC). The Construct validity evaluated by Spearman's rank correlation coefficient between DHI and DASH and VAShd. Sensitivity to change was estimated using standardized response mean (SRM), and effect size (ES). **Results.** Mean age of the patients was 30,25±11,07 years. Totally 140 fingers of 52 male, and 13 female patients were injured. Internal consistency, and test-retest reliability of DHI were at an excellent level. Chronbach's alpha, and ICC values were found to be 0.87, and 0.99, respectively. In the assessments of validity, highly significant correlation was detected between DHI with scores of DASH, and VAS-hd scales ($r=0,86$, $p<0,0001$, $r=0,54$, $p<0,0001$ respectively). Standardized response mean values were higher than 0.80 for total and all subgroup scores of DHI, while ES estimates for total, and all subgroup scores related only to workplaces, and other subgroups were 0.66, and 0.79, respectively, however total and all other subgroup scores were above 0.80. **Conclusion.** DHI is a reliable, valid questionnaire to assess hand related activity limitation in patients with traumatic hand injuries. Also due to its high level responsiveness. DHI can be used for assessing the clinical course of the traumatic hand injured patient.

Musichotherapy and parkinson's disease

A. De Serio¹, D. Forenza², G. Megna³

¹Professor, Music Conservatory – University, Bari (Italy)

²Engineer, Landscape Bioecologist, M.A. Academy, Bari (Italy)

³Professor, Medical Faculty, Dept. of Rehabilitation Medicine, University, Bari (Italy)

Introduction. In Rehabilitative Medicine the Musicotherapy can enhance the afferent pathways for the cortical image of every kinetic project. In this experimental work the Authors carry out the Parkinson's Musicotherapy Plan (PkMtP). The Parkinson's disease attacks the extrapyramidal system and loosens the ventral system function that provides for posture and automatic movements. The nondominant (right) hemisphere fulfils a surveillance function towards these automatic movements that take part in daily motor and relations acts. The Musicotherapy is a rehabilitative reinforcement to improve the nondominant hemisphere function and automatic kinetic programs. **Materials and methods.** Ten male patients with Parkinson's disease (aged from 40 to 75) take part in the individual Musicotherapy (Mt) treatment twice a week for six months in their hospital room. Mt session length: 45 minutes. Sonorous-Musical Instruments (SMI): Rhythmic Instruments (RI) as percussions and Edible SMI (ESMI) the first Author has invented; Melodic Instruments (MI); recorded music. Several stages of PkMtP: welcome song; patient's Rhythmic/Melodic Improvisation (RMImp) by RI, voice (rhythmic speech, singing drills), MI; patient/musictherapist's Musical Dialogue (MD); song composition; recorded music listening connected with patient's Physical Activity (PhyA) of upper/lower limbs in accordance with the Musical Parameters Features (MPaFe). – Analysis of RMImp, MD, PhyA. - Evaluation of patient's Cardiac Frequency (CF) and Blood Pressure (BPr) before/ after Mt treatment. **Results.** The MPaFe-movement system promotes a patient's emotional swelling / slackening and the physical activity, mood, speech and self esteem improvement. After the Mt the patient's CF and BPr values and the neuropsychophysical balance show a normotypic trend. **Conclusion.** The PkMtP improves teleological motor sequences and social relations and then it's an important rehabilitative opportunity for Parkinson's disease.

References

De Serio A., Forenza D., Megna M., Megna G., 2007, Musichotherapy and physical activity in the ageing and chronic diseases, The 4th ISPRM World Congress, Seoul, Korea.

Pulmonary Rehabilitation: Which Cardiovascular Evaluation previous to a Pulmonary Rehabilitation Program?

S. Marques, M.M. Ribeiro, M.J. Miranda

Centro Hospitalar do Porto, Hospital Santo António, Physical Medicine Rehabilitation Department

Chronic Obstructive Pulmonary Disease (COPD) affects about 5% of adult population. It is most certain that in the near future this disease will be the third leading cause of death and the fifth leading cause of disability worldwide. Rehabilitation Pulmonary is now a well-established evidence-based therapy for patients with chronic lung disease. COPD is a systemic disease with extra-pulmonary manifestations, namely cardiovascular disease. Many epidemiological studies demonstrated that COPD is an independent risk factor for cardiovascular disease (arrhythmias, ischemic heart disease and heart failure). The fact that COPD is by itself an independent risk for cardiovascular disease stresses the need to define a very specific evaluation before initiating a pulmonary rehabilitation program. The authors propose a cardiac evaluation protocol for Chronic Disease Pulmonary patients who are candidates to a Pulmonary Rehabilitation Program.

References

Don D. Sin and Paul Man. Why are Patients With Chronic Obstructive Pulmonary Disease at Increased Risk of Cardiovascular Diseases?: The Potential Role of Systemic Inflammation in Chronic Obstructive Pulmonary Disease. *Circulation* 2003;107:1514-1519.

Don D. Sin and S. F. Paul Man. Chronic Obstructive Pulmonary Disease as a Risk Factor for Cardiovascular Morbidity and Mortality. *The Proceedings of the American Thoracic Society* 2:8-11(2005).

Joseph Finkelstein, Eunne Cha, Iland Steven M Scharf. Chronic Obstructive Pulmonary Disease as an Independent Risk Factor for Cardiovascular Morbidity. *Int J Chron Obstruct Pulmon Dis.* 2009;4:337-349.

Characterizing a Portuguese lower limb amputee population

I. Machado Vaz, V. Roque, S. Pimentel, H. Duro

Hospital S. João, E.P.E., Porto

Introduction. This study aimed to characterize sociodemographic variables, level and cause of amputation, quality of life, functional capacity and psychiatric disability of Portuguese lower limb amputees. **Materials and methods.** Participations were 27 patients with lower limb amputation with mean duration of 48 days. They were recruited as a consecutive sample of new referrals with lower limb amputation. Participants were asked to fill in a questionnaire that included a battery of questions requesting brief information about sociodemographic variables and characteristics of amputation. The quality of life was characterized by the SF-36, the functional capacity was quantified by the Amputee Mobility Predictor (AMP), and the level of depression and anxiety in each participating patient was assessed by the Hospital Anxiety and Depression Scale (HADS). **Results.** Of the 27 patients, 81,5% were man (N = 22), mean age 68,5 years old, 81,5% (N=22) were married, 11,1% (N=3) were single and 7,4% (N=2) were widowers, 96,3% (N=26) were unemployed, 88,9% (N=24) had amputations of vascular cause, 63,0% (N=17) had above the knee amputations. The mean score of the SF-36v2 for physical component summary was 32,3 and for mental component summary was 42,4. Data from AMP showed mean 8,82, ranging from 3 to 20. Based on HADS our results showed that among the 27 amputees: 44,4% (N=12) had an anxiety (level \geq 8), and 37,0% (N=10) had depression (score \geq 8). **Conclusion.** The findings of the present study reinforce the high incidence of psychiatric disability in amputees. It suggests that psychiatric evaluation and adequate rehabilitation should be part of their overall management.

References

Hawamdeh ZM, Othman YS, Ibrahim AI. Assessment of anxiety and depression after lower limb amputation in Jordanian patients. *Neuropsychiatric Diseases and Treatment* 2008. 4(3):627-633. Unwin J, Kacperek L, Clarke C. A prospective study of positive adjustment to lower limb amputation. *Clinical Rehabilitation* 2009. 23: 1044-1050

Short term effectiveness of ultrasound therapy in knee osteoarthritis

F. Tascioglu, S. Kuzgun, O. Armagan, G. Ogutluer

Osmangazi University, Faculty of Medicine, Department of Physical Therapy and Rehabilitation, Eskisehir, TURKEY

Introduction. The aim of this study was to evaluate the short term efficacy of ultrasound therapy in patients with knee osteoarthritis (OA). **Materials and methods.** The study design was randomized, placebo-controlled and double-blinded. Ninety patients with bilateral knee OA according to the American Collage of Rheumatology criteria were randomly assigned to three treatment groups: In group I continuous ultrasonic waves with 1 MHz frequency and 2 watt/cm² power were applied for 5 minutes in each session. In the second group, for the pulsed sonication, the same ultrasound was set at a frequency of 1 MHz and 2 watt/cm² power and pulsed mode duty cycle of 1:4. The patients in the third group were treated with placebo ultrasound. All treatments were applied 5 times a week, with 10 treatments in all. Therapeutic effects were evaluated by visual analog scale for pain, Western Ontario and McMaster Universities osteoarthritis index scores (WOMAC), 20 meter walking time, and knee range of motion. Assessments were done at baseline and at the end of the treatment. **Results.** Compared to baseline, significant improvements were observed in VAS (p=0.011, p=0.000, p=0.013, respectively) and WOMAC scores (p= 0.049; p=0.001; p= 0.046, respectively) in all groups. The reduction in pain and WOMAC scores were significantly higher in patients treated with pulsed ultrasound than in patients in the placebo group (p=0.012, p= 0.039). We found no significant improvement in ROM values within the groups at the end of the treatment. No significant improvements over placebo were observed with regard to ambulation speed and range of motion. **Conclusion.** We suggest that pulsed ultrasound therapy is a safe and effective treatment modality in patients with knee OA. Further research is required to investigate the long-term efficacy, other dosages and application forms of therapeutic ultrasound.

References

Huang MH, Lin YS, Lee CL, Yang RC. Use of ultrasound to increase effectiveness of isokinetic exercise for knee osteoarthritis. *Arch Phys Med Rehabil* 2005; 86: 1545-51.

Ozgonenel L, Aytekin E, Durmusoglu G. A double-blind trial of clinical effects of therapeutic ultrasound in knee osteoarthritis. *Ultrasound Med Biol* 2009; 35: 44-9.

Treatment of carpal tunnel syndrome with low level laser: Clinical, ultrasonographical and electrophysiological assessment

F. Tascioglu¹, N. Akcar Degirmenci², S. Ozkan³, O. Mehmetoglu¹

Osmangazi University, Faculty of Medicine, Departments of

¹*Physical Therapy and Rehabilitation,*

²*Radiology,*

³*Neurology, Eskisehir, Turkey*

Introduction. The aim of this study was to investigate the efficacy of low level laser therapy in patients with carpal tunnel syndrome (CTS). **Materials and methods.** The study design was randomized, placebo-controlled and double-blinded. Sixty patients with CTS were included and randomly assigned to three treatment groups: active laser with dosage of 1.2/2 minutes/per painful point, active laser with a dosage of 0.6J/2 minutes/per painful point, and placebo laser treatment groups. A total of 5 points across the median nerve trace were irradiated with the laser probe. For the source of low power laser, a Gal-Al-As diode laser device was used with a power output of 50 mW and a wavelength of 830 nm. The patients were treated 5 times weekly with 10 treatments in all. The clinical assessments included pain intensity measured by visual analogue scale (VAS), grip strength symptom severity Score (SSS), functional status score (FSS), and nerve conduction studies. In addition, the cross-sectional area of the median nerve was measured by ultrasonography. **Results.** Compared to baseline, VAS scores (group 1, $p < 0.001$; group 2, $p < 0.001$; group 3, $p < 0.01$) and grip strength ($p < 0.05$) improved significantly in all groups at the end of the study. Similarly, significant improvements were observed in both active treatment groups ($p < 0.001$) and placebo laser group ($p < 0.01$) with regard to SSS and FSS ($p < 0.05$) scores. The CSA of median nerve did not show any improvement within the groups. Only sensorial nerve velocity measurements on the palmar region showed a significant improvement in both active laser groups at the end of the therapy ($p < 0.01$). No significant differences were found among the treatment groups with regard to outcome measures chosen in this study. **Conclusion.** With the chosen laser type and dose regimen, the results that we obtained in this study, suggested that low-level laser therapy has no superiority over placebo in CTS.

References

- Evcik D, Kavuncu V, Cakir T, Subasi V, Yaman M. Laser therapy in the treatment of carpal tunnel syndrome: a randomized controlled trial. *Photomed Laser surg* 2007; 25: 34-9.
- Yagci I, Elmas O, Akcan E, Ustun I, Gunduz OH, Guven Z. Comparison of splinting and splinting plus low-level laser therapy in idiopathic carpal tunnel syndrome. *Clin Rheumatol* 2009; 28: 1059-1065.

Therapeutic Potential of Different Modes of Exercise in Type 2 Diabetes

W. Geidl, K. Pfeifer

Institute of Sport Science and Sport, Friedrich-Alexander University Erlangen-Nuremberg, Germany

Introduction. The effects of endurance, resistance and combined training on glucose control and some cardiovascular risk factors for persons with Typ 2 Diabetes are well known (Snowling 2006, Thomas 2006). A comprehensive review of the therapeutic potential of different modes of exercise is missing. **Materials and methods.** We used systematic hierarchic review methods to identify potential scientific reports, determine the eligibility, synthesize results and interpret findings in a narrative way. We conducted searches in MEDLINE, and Scopus until December 2008. In a first step guidelines, reviews and meta-analyses were evaluated. Analysis of primary studies was limited to topics where no systematic work was available. English- and German-language reports of exercise interventions for adults with Typ 2 Diabetes were eligible for inclusion. **Results.** Endurance training improves inflammation, sympathovagal balance, arterial stiffness and endothelial function, furthermore it prevents hypoglycaemia, peripheral neuropathy and microalbuminuria. Resistance training is superior to increase muscle strength, muscle mass and lean body mass. Both exercise interventions are safe. The risk of adverse events is low. One primary study with systematic efforts to seek and document adverse events reported considerable higher event rates than reviews for both interventions. Diabetic subpopulations with severe obesity, exercise intolerance, neuropathy, osteoarthritis and low motivation could be mentally and physically overcharged of requirements of endurance programs with subsequent high dropout. **Conclusion.** A comprehensive review of the

effects of different modes of exercise including adverse events, extended cardiovascular risk profile, long term complications and applicability for diabetic subpopulations contributes to appropriate exercise prescriptions for persons with Typ 2 Diabetes.

References

- Snowling NJ, Hopkins WG. Effects of different modes of exercise training on glucose control and risk factors for complications in type 2 diabetic patients: A meta-analysis. *Diabetes Care* 2006; 29(11): 2518-2527
- Thomas D, Elliott E, Naughton G. Exercise for type 2 diabetes mellitus. *Cochrane Database of Systematic Reviews* 2006

Chronic low back pain, depression and functional impairment: a correlation study

A. Montez¹, P. Figueiredo², J. Páscoa Pinheiro^{2,3}, M. Quartilho^{3,4}, J. Branco²

¹*Hospitais da Universidade de Coimbra, Portugal*

²*Serviço de Medicina Física e de Reabilitação dos Hospitais da Universidade de Coimbra, Portugal*

³*Faculdade de Medicina Universidade de Coimbra, Portugal*

⁴*Serviço de Psiquiatria dos Hospitais da Universidade de Coimbra, Portugal*

Introduction. Low back pain represents 18% of chronic pain. Chronic low back pain is a major problem of public health with enormous economic, psychological and social consequences. This pain condition is associated with increased disability, lower quality of life and poor relationship satisfaction and the psychological factors are excellent prognosis predictors. One in five chronic pain sufferers had been diagnosed with depression as a result of their pain and these two conditions are frequently associated. This study pretends to determine the relationship between low back pain, psychopathological symptoms and its influence in patients' quality of life. **Materials and methods.** This clinical study included 31 patients with chronic low back pain for more than 12 weeks, from both genders older than 40 years old and younger than 70 years old. Assessment tools included the following health questionnaires: Oswestry Disability Index – version 2, Brief Symptom Inventory e Short-Form-36, in the Portuguese validated versions. **Results.** This sample obtained an "incapacity score" of 35,80%, corresponding to moderate disability. The quality of life of the patients with low back pain is globally poor and its physical dimension is more affected than its mental dimension. It was demonstrated a higher prevalence of somatization ($r=0,000$) and depression ($r=0,039$) in this sample than in the general population. The Positive Symptoms Indice of Brief Symptom Inventory also has a higher value on this sample; which allows us to classify it as a population with a higher prevalence of emotional disturbances. There are significant correlations between these psychopathological dimensions and the total Oswestry Disability Index (incapacity) but not with the pain intensity. The pain resulting incapacity is associated with a lower quality of life. The quality of life is also lower when associated with somatization and depression, but it is essentially affected on its mental dimension. **Conclusion.** Low back pain is associated with more incapacity and its course is associated with psychological and social variables. It supports the importance of effectively managing psychological factors and emotional distress when treating low back pain.

Dynamic Elbow Supination Brace to Correct Elbow Contracture

Ki Un Jang, Ji Soo Choi, Ju Youn Lee, Jeong Hyeon Mun, Cheong Hoon Seo

Department of Rehabilitation Medicine, Burn Center, Hwangang Sacred Heart Hospital, Hallym University Medical School, Seoul, South Korea

Introduction. Patients who have limit of elbow supination from burn often contend with a severe functional limit in activity of daily living.¹⁾ Conventional splint or serial casting were invented to prevent elbow contracture, however it could not often improve elbow supination anymore.²⁾ The purpose of this article is to present a dynamic forced elbow supination orthosis to overcome this problem. **Cases.** A burn patient, who had 3rd 40% flame burn and extensive burn of upper extremities, face, neck, and chest, had a limit of left elbow supination nearly 0 degree. The hypertrophic scar and skin contracture were developed around both elbow joint, which results in moderate to severe contracture of elbow. The physical modality of infrared, laser, complex exercise and occupational

therapy were daily performed, and then the range of motion was beginning to improve but at night it was again aggravated. Repeated daily treatment with conventional elbow splint made only the flexion angle improved to 90 flexion, but supination angle showed nearly no change. In 4 weeks, the supination angle was improved to only 35 degree. In addition of treatment, the dynamic elbow supination brace was fabricated,³⁾ which has a supination power by a rubber band or spring device of the orthotic joint. The orthosis was keeping a lower grade sustained corrective force with custom made design and comfortable material.⁴⁾ Elbow supination had improved to 60 degree by this brace, however this brace also had some problems which need to be improved in order to have more effectiveness and comfortable function. **Conclusion.** The dynamic forced elbow supination orthosis with limited motion joint had improved the range of supination motion, which could not be corrected anymore by the conventional static brace and exercise.

References

1. Schneider JC, Holavanahalli R, Helm P, O'Neil C, Goldstein R, Kowalske K. Contractures in burn injury part II: investigating joints of the hand J Burn Care Res. 2008 Jul-Aug;29(4):606-13
2. Kwan MW, Ha KW Splinting programme for patients with burnt hand. Hand Surg. 2002 Dec;7(2):231-41. Review
3. Richard R, Shanesy CP 3rd, Miller SF. Dynamic versus static splints: a prospective case for sustained stress. J Burn Care Rehabil. 1995;16(3Pt1):284-7
4. Li-Tsang CW, Hung LK, Mak AF. The effect of corrective splinting on flexion contracture of rheumatoid fingers. J Hand Ther. 2002;15(2):185-91.

Evaluation of the hands function in Charcot-Marie-Tooth patients by sensory-engineered gloves

M. Monti Bragadin^{1,2}, L. Padua^{2,4}, M. Grandis¹, L. Reni¹, E. Bellone¹, S. Porohkina¹, M. Grosso¹, A. Tacchino³, G. Abbruzzese¹, G. Maggi⁶, M. Bove³, A. Schenone^{1,5}

- ¹Department of Neurosciences, Ophthalmology and Genetics.
²Institute of Bioimages and Molecular Physiology, CNR, Genoa, Italy
³Department of Experimental Medicine, Section of Human Physiology, University of Genoa, Ital
⁴Department of Neurosciences, UCSC University, Rome, Italy.
⁵Don Gnocchi Foundation, Italy
⁶Department of Rehabilitation Medicine, San Martino Hospital, Genoa, Italy.

Introduction. Charcot-Marie-Tooth disease (CMT) is an inherited sensory-motor neuropathy in which weakness and atrophy of intrinsic hand muscles may be late event, their impact on the patients life being often underestimated. **Materials and methods.** 7 CMT patients (3 males, 4 females, age 38.7 ± 12.6) entered the study. They wore sensory-engineered gloves and performed uni- and bimanual finger tapping movements, without visual feedback, at self paced mode, maximum voluntary rate and externally paced rates (1Hz, 2Hz, 3Hz). Custom-made software generated pacing signals and recorded the movement parameters.¹ In addition, the 9 hole peg test, handgrip and 3 point grip strength, Borg and VAS scales (to evaluate exertion and fatigue) and DASH Questionnaire were applied. **Results.** The touch duration/inter tapping interval ratio was significantly higher in CMT subjects than in normal subjects mainly during the execution of externally paced finger movements. Accordingly the DASH Questionnaire detected a moderate disability in CMT subjects. Both results were worse in patients more severely affected, as judged by neurophysiological tests. The 9HPT was almost unchanged before and after the finger tapping movements. Patients showed a trend to strength deterioration, except for the non-dominant 3 point grip. **Conclusion.** With this study we show that the integration of the motor and proprioceptive systems in CMT disease subjects during the execution of finger movements is affected. We will also present data regarding: 1) the ability of CMT patients to perform uni and bimanually and the differences between dominant and non-dominant hand; 2) fatigue after repeated hands exercises; 3) correlation of the sensory-engineered gloves with some other common outcome measures of hands function, to validate a new protocol for the hand assessment in CMT patients.

References

1. M Bove et al The effects of rate and sequence complexity on repetitive finger movements Brain Res 2007; 1153: 84-91.

Efficacy of Extracorporeal Shock Wave Therapy for the treatment of spasticity in Cerebral Palsy (CP): a pilot study

V. Gasparroni¹, C. D'Agostino¹, A.M. Lopez Lopez¹, C. Pisciotta¹, S. Respizzi¹, B. Bernardini¹, N.M. Portinaro²
¹Neuro Rehabilitation Dpt. Humanitas, Rozzano (Italy)
²Orthopaedic Dpt. University of Milan and Pediatric Orthopaedic Dpt Humanitas, Rozzano (Italy)

Introduction. Spasticity is an abnormality of the tonic stretch reflex, commonly found in Cerebral Palsy (CP). Spasticity interferes with the normal growth and functionality of muscle-tendons and bone, and leads to secondary musculoskeletal deformities and functional limitations and disability. The principal treatment aim in CP is to decrease and control spasticity to retard the development of secondary muscular and skeletal structural alterations, thus avoiding or delaying the need for surgery. Extracorporeal Shock Waves Therapy (ESWT) has been proved to be efficacious in the treatment of tendon and osseous diseases, and its use has recently been extended to the ulcers and tissue healing field. In recent years, evidence from the Literature suggests that ESWT can reduce muscle spasticity but more evidences are necessary. **Materials and methods.** The rationale of a pilot study is to prove safety and efficacy of ESWT for the treatment of muscle spasticity in CP. 9 children with spastic diplegic CP between the age of 6 and 10 years and Gross Motor Function Classification System (GMFCS) levels of I,II were recruited for this study. Participants were evaluated before (baseline) and after (follow-up) the intervention period (T1) and 3 months later (T2). The intervention program included 4 sessions of ESWT (once a week). Primary outcome measurements were: ankle ROM, calf spasticity by MAS and Tardieu scales, descriptive walking abilities by Function walking scale levels and quantitative gait analysis. Secondary outcome were individually defined by Goal Attainment scale (GAS). **Results.** Statistically significant improvements in ankle ROM, calf spasticity by MAS, walking abilities by Function walking scale levels and spatial temporal parameters were found at T1 maintained at T2. No significant changes were found in kinematic and kinetic gait parameters. **Conclusion.** These findings provide clinical evidence in this new field of application in term of efficacy, safety and painless treatment approach in CP tone reduction

References

1. Bohannon RW, Smith MB: Interrater reliability on a modified Ashworth scale of muscle spasticity. Phys Therapy 1987;67:206-207.
2. P.Manganotti,MD,PhD E , Amelio,MD :“Long-term effect of Shock Wave Therapy on upper limb hypertonia in patients affect by stroke”. Stroke,Sep 2005;36:1967-1971.
3. Eleopra R, Tunioli V, De Grandis D: The variability in the clinical effect induced by botulinum toxin type A: the role of muscle activity in humans. Mov Disord 1997;12:89-94.

Evaluation of long-term use of a static hand-wrist orthosis in patients after chronic stroke

J.W.G. Meijer, D. van Grinsven, J. Fassaert, G. Jordan, R. Blok, A. Andringa
 Rehabilitation Center Breda / Revant Rehabilitation Centers and OIM-Brabant Breda; Breda, the Netherlands.

Introduction. Many chronic stroke patients have a non-functional spastic upper extremity. Despite of spasticity treatment by paramedical interventions, medication, nerve or neuromuscular blocks or orthotics, flexor contractures and secondary complications occur, such as pain and problems of the skin and hygiene maintenance, sometimes even leading to clenched fist. To prevent contractures, static orthotics worn 8 hours/day are prescribed. These static orthotics seem to cause pain and discomfort, and therefore cannot be worn the required 8 hours/day. In this study we evaluate the use of a static orthosis in chronic stroke patients. **Materials and methods.** All stroke patients in our institute who received a static wrist-finger orthosis to inhibit spasticity and prevent contractures were included. They were interviewed on current use, effects on spasticity, hygiene maintenance and pain and applied co-interventions. **Results.** Thirteen patients were included (mean age 58 years, 12 months after prescribing the orthosis, 15-20 months post-stroke). 2/13 (15%) stopped using the orthosis because of the negative influence on pain and spasticity. Of the remaining 11 users, 5 (45%) complained about comfort, 2 (19%) did not resist use 8 hours/day because of discomfort. No positive effects on spasticity were reported, a slight effect on pain and in some effects on hygiene maintenance. Seven patients (64%) needed co-interventions to endure spasticity and

wearing the orthosis by medication use (oral or Botulinum toxin) or paramedical treatment (9/11, 82%). **Conclusion.** Half of the patients with static orthosis to prevent contractures complain about discomfort and need co-interventions. Fifteen % stopped wearing the orthosis and of the remaining 11 patients 2 (19%) could not stand the prescribed wearing time. The combination of a static device and fluctuating spasticity levels lead to pain and discomfort. For these patients, a dynamic orthosis according the Low Load Prolonged Stretch principle might be more adequate.

Effects of application of 0,485MHz radio-frequency through the use of a capacitive-resistive energy transfer on the muscle tissue using a double-blind crossover study

M. Tofanicchio¹, C. Tranquilli², G. Annino¹, M. Hawamdeh¹, L. Giordani¹, G. Della Bella¹, B. Contini¹, E. Fanucci¹, Bernardini¹, C. Foti¹

¹PRM University of Rome "Tor Vergata", Italy

²Istituto of Medicine and Science of Sport "A.Venerando" – CONI – Rome, Italy

Introduction. Considerable interest raises the application of capacitive-resistive systems in sports medicine and rehabilitation **Materials and methods.** Ten subjects (27±2,5aa), with a negative history of traumatic fractures, neoplastic or internal diseases, were randomly recruited into 2 groups according to treatment modalities. Case Group: applications of 0.485 MHz capacitive-resistive radio-frequency with 10 min capacitive/10 min resistive/10 min capacitive mode performed bilaterally on the quadriceps muscle using TECAR[®] device. Control Group: placebo. All subject were submitted to: CPK, myoglobin and lactate blood analysis; Bilaterally Power-Doppler evaluation of quadriceps muscle, measuring small (1 mm) medium (3mm) and large (> 3mm) spots on repere points; After 8 min of warming up, CMJ, CJ 0-15s and CJ0-5s were measured on a platform (Ergo jump, BoscoSystem). After 7 days, the Case Group was submitted to placebo and Control Group to protocol by a Cross-Over study design. **Results.** A mean increase (m.i.) of CPK (p<0,05), Myoglobin (p<0,01), Lactate (p<0,03) was observed in both groups, but less increase in subjects in Case Group. Only in case group, a m.i. of small (1 mm) medium (3mm) and large (> 3mm) spots was observed (p<0,002). It was observed a decrease of Power (W/Kg) in the control group (p<0,04). **Conclusion.** The application of 0.485 MHz capacitive-resistive radio-frequency, allows the reduction of recovery time after repeated muscle exercises.

Ultrasound findings and the efficiency of physical therapy with patients suffering from knee sprain

S. Muraj, B. Markulinčić

Special hospital for physical medicine and rehabilitation Stubičke Toplice, Croatia

The aim of this study is to present ultrasound findings and efficiency of physical therapy in treating the patients with sprained knee **Materials and methods.** in this study 60 patients were included at the average age of 32 and a recent knee sprain. The average length of treatment was 24 days. Before starting with physical therapy all of the patients underwent an ultrasound examination of knee by means of Shimatzu 2200 using a linear probe at the frequency of 8,5-10 MHz. The patients were given kinesitherapy treatment following the local kriotherapy of the knee as well as a 30 minute low-frequency electromagnetic therapy. We were observing the range of movement, swelling, quadriceps hypotrophy and WOMAC 3.0. All of the measurings were done before and after treatment. **Results.** The most common ultrasound finding established with 38 patients is lesion of medial knee structures; 20 had medial collateral ligament injury and 18 medial meniscus lesions. 8 patients had laesions of lateral knee structures; 4 lateral collateral ligament sprains and 4 lateral meniscus injuries. 14 patients had extensor apparatus injuries; 5 patients displayed patellar tendon sprain, 1 patellar tendon tear, 5 had quadriceps tendon sprain while 3 had quadriceps tendon tears. 47 patients had swellings; 37 of them were diagnosed with joint effusion and 10 had periarticular tissue edema. Statistical analysis was carried out using Excell 2003 namely PHStat with t- test. All parameters observed showed a statistically significant improvement above the level of p= 0,05. **Conclusion.** physical therapy proved to be highly efficient in treating knee sprain. The dia-

gnostic ultrasound was proved to be very useful in planning the treatment due to its availability and the possibility of soft tissue examination. Knee swelling was caused by joint effusion with majority of patients.

References

1. Pečina M. i sur. Ortopedija, Zagreb, Naklada Ljevak, 2000, 261-268.
2. Chhem R, Cardinal E. Guidelines and Gamuts in Musculoskeletal Ultrasound, New York, Wiley-Liss, 1999, 161-211.
3. Cluett J. Rehabilitation For the Knee Updated June 10, 2009

Effects of reduced lumbar load by the use of a vertical traction device on dynamic subjects

P. Balthazard¹, D. Goldman¹, E. Staderini², G. Gigante³, Sa. Gentili³, S. Mugnaini³

¹HECVS HES-SO University of Applied Sciences Western Switzerland, Lausanne

²HEIG-VD HES-SO University of Applied Sciences Western Switzerland, Yverdon les Bains

³Cattedra di Medicina Riabilitativa, Università degli Studi di Roma "Tor Vergata" Viale Oxford

Introduction. Treatment by reduced loading on the spine has been associated with manual or mechanical traction. However, to date, current evidence is considered insufficient to permit conclusion regarding the effect of vertebral traction on net health outcomes. **Materials and methods.** We've been interested by positive subjective clinical results through the application of "Vertical Ambulatory Traction Device" on LBP patients. This reduces the load on the lumbar spine while allowing the subject to remain active and functional in the upright position. The purpose of the study is to quantitatively validate the clinical effects by using an instrumentation system that will acquire multiple mechanical and bioelectrical measures to be correlated with each other and with clinical results. A multifunctional multisensor device will acquire simultaneously, muscular activity of erector spinae from electromyogram , deep abdominal muscles movement through UWB radar, mechanical forces and torques applied by the body by strain gauges and, body positions and movements by a set of accelerometers/inclinometers. At first, measurements will be performed before, during and after the application of the device on a homogeneous group of 60 healthy subjects, **Results.** We have paid great attention to the review of the literature, and therefore, at the sample selection, at the design and technical implementation of the apparatus of research, in order to have comparable data with other works and repeatable tasks. **Conclusion.** We can consider developments of new strategies of muscular recruitment through modified proprioceptive inputs induced by the apparatus in the erect position.

References

- Judy a clarke, maurits w van. Traction for low-back pain with or without sciatia issue 2, 2010 HYPERLINK "" \n initwin cochrane .Shrawankumar, nar-simhaprasad torso muscle emg profile differences between patients of back pain and control clinicalbiomechanics25(2010)103-109.
Jacekholewicki angelas.lee comparison of trunk stiffness provided by different design characteristics of lumbosacral orthoses clinicalbiomechanics25(2010)110-114

Multidisciplinary team experience regarding rehabilitation of hand traumatic pathology, based on case presentations

C.M. Brailescu¹, R.G. Scarlet¹, A. Murgu¹, A.S. Nica¹, G. Mologhianu¹, I. Lascar²

¹National Institute of Rehabilitation Medicine, Bucharest

²Floreasca Emergency Hospital Bucharest, Plastic Surgery Department "Carol Davila" University of Medicine, Bucharest, Romania

Introduction. As National Institute of Rehabilitation Medicine in Romania, we manage with all kind of pathology in PRM area (orthopedic, rheumatologic, post-surgical, neurologic cases) and we have the chance to work as a team with multi-disciplinary specialists. During the last several years, we have had the opportunity to collaborate with the best Plastic and Reconstructive Surgery Department of Romania, from Floreasca Emergency Hospital of Bucharest, headed by the professor Ioan Lascar, one of the most famous specialists in hand surgery. **Materials and methods.** This paper presents

generalities about hand traumatic pathology (causes, mechanisms, affected structures) and a management plan depending on the seriousness of the damage, in which hand rehabilitation is a major therapeutic sequence after and between sequential plastic surgery steps. We also present some interesting clinical cases with different pathologies of the hand - especially major post-traumatic events (with vascular, neurologic, bony and soft tissue traumas, amputation), but also rare conditions (such as Lewandowski-Lutz syndrome), which needed complex plastic surgery intervention, prepared and/or followed by a hand rehabilitation program in our clinic, with great results for the patients. **Results.** The rehabilitation program followed by the patients in Clinique II of National Institute is complex, consisting in: electrotherapy, thermotherapy, therapeutical massage, kinethotherapy, occupational therapy and is a team work, with inter-disciplinary cooperation: rehabilitation team, surgeons, orthetist, ergotherapist, social assistant, psychotherapist. **Conclusion.** Hand rehabilitation is a complex process, which needs promptitude, perseverance, vocation, experience, compliance and medical multi-disciplinarity. Hand rehabilitation is a necessary sequence in postsurgical traumatic pathology for improving the patient's quality of life and for increasing the functional level for ADLs and social and professional readaptation.

References

1. DeLisa J. et al. Physical Medicine and Rehabilitation. Principles and Practice. Lippincott, Williams & Wilkins, Fourth Edition, 2005.
2. The UEMS PRM Section and Board and the Academie Europeene de Medecine de Readaptation. White Book on Physical and Rehabilitation Medicine in Europe, Europa Medicophysica vol.42,no.4, dec.2006.

Evidence-based results of using Rehabilitation program for neurological sequelae after traumatic injuries of the hand

C.M. Brailescu¹, R.G. Scarlet¹, A.S. Nica¹, A. Murgu¹, G. Mologhianu¹, I. Lascar²

¹National Institute of Rehabilitation Medicine, Bucharest
²Floreasca Emergency Hospital Bucharest, Plastic Surgery Department "Carol Davila" University of Medicine, Bucharest, Romania

Introduction. The neurological sequelae after traumatic injuries of the hand represent a frequent pathology and have a major impact on the functionality of the hand (impairment) and on the reintegration of the patient in social and professional life (handicap). **Materials and methods.** We studied a group of 50 patients with neurological pathology after different hand traumas, who participated in a complex Rehabilitation program in Clinic 2 of the National Institute for Rehabilitation between may-december 2009. We used specific statistical analysis referring to epidemiological dates and to special clinical and functional score evolution, grouped for each of the type of neuropathy (median, ulnar, radial and complex). **Results.** The study demonstrates the improvement of the clinical and functional parameters after the rehabilitation therapy - prehension recovery, ability and coordination improvement, pain management and above all, familial and social reintegration. **Conclusion.** Neurological sequelae are a frequent problem after traumatic pathology of the hand and the dysfunctionality and the handicap derived could be minimized by an early and sustained rehabilitation program, especially through occupational therapy.

References

1. DeLisa J. et al. Physical Medicine and Rehabilitation. Principles and Practice. Lippincott, Williams & Wilkins, Fourth Edition, 2005.
2. The UEMS PRM Section and Board and the Academie Europeene de Medecine de Readaptation. White Book on Physical and Rehabilitation Medicine in Europe, Europa Medicophysica vol.42,no.4, dec.2006.

The importance of ergotherapy in rehabilitation of the soft-tissues sequelae after hand traumatic injuries

C.M. Brailescu¹, R.G. Scarlet¹, A. Murgu¹, G. Mologhianu¹, A.S. Nica¹, I. Lascar²

¹National Institute of Rehabilitation Medicine, Bucharest
²Floreasca Emergency Hospital Bucharest, Plastic Surgery Department "Carol Davila" University of Medicine, Bucharest, Romania

Introduction. Ergotherapy or occupational therapy is an active method used for physical and psychological reeducation, based on simple basic activities from daily living, aiming to increase the functionality and the independence of the patient, helping him to adapt to the deficit/handicap and to reintegrate into the family and society.

Materials and methods. Occupational therapy is a very useful method for soft tissues sequelae after hand traumatic injuries and is a major part of the rehabilitation program for functional reeducation of the hand. We present the data after analysing a group of 52 patients with different sequelae after hand injuries, who participated in a two-weeks Physical and Rehabilitation Medicine program in Clinique 2 of the National Institute of Rehabilitation, between July and December 2009. **Results.** The PRM program applied to the patients was strictly individualised, with periodic evaluation and consisted in electrotherapy (antialgic and neuromuscular stimulating effects), therapeutical massage, kinethotherapy and 2-3 sessions of ergotherapy per day; the results proved better pain and scar management, the improvement of articular and muscular status, better prehension with better ADL performance, meaning a better functional independence and quality of life. **Conclusion.** The study showed a major improvement of the clinical and functional status of the patient, proving the role of ergotherapy in hand injuries management and in social readaptation of the patients.

References

1. DeLisa J. et al. Physical Medicine and Rehabilitation. Principles and Practice. Lippincott, Williams & Wilkins, Fourth Edition, 2005
2. The UEMS PRM Section and Board and the Academie Europeene de Medecine de Readaptation. White Book on Physical and Rehabilitation Medicine in Europe, Europa Medicophysica vol.42,no.4, dec.2006

Rehabilitation program after brachial plexus traumatic pathology; evidence-based study

C.M. Brailescu¹, R.G. Scarlet¹, G. Mologhianu¹, A.S. Nica¹, A. Murgu¹, I. Lascar²

¹National Institute of Rehabilitation Medicine, Bucharest
²Floreasca Emergency Hospital Bucharest, Plastic Surgery Department "Carol Davila" University of Medicine, Bucharest, Romania

Introduction. The most frequent cause of brachial plexopathy is the traumatic traction mechanism by avulsion of superior limb, with plexus elongation or even rupture of C5-C8 anterior roots and T1 root (in which brachial plexus consists of). The occupational accidents with catching and avulsion of superior limb are quite often; these events represent not only a major individual trauma, but also a social problem for young working people. **Materials and methods.** The study had been conducted in Clinique 2 of the National Institute for Rehabilitation, on 60 patients with traumatic injuries of brachial plexus, on a period of 8 month evolution. **Results.** The results show improvement of parameters - the clinical and functional evaluation using specific scales (articular mobility and muscular strength measurements, FIM, Rankin, Illinois) evoking improving of the severe disfunction for self-caring and ADL performing during the treatment period. It presents, also, the importance of rehabilitation programme as an essential therapeutical sequence after plastic surgery for severe dysfunctional sequelae post-avulsional injury of brachial plexus. **Conclusion.** In brachial plexus neurotmesis with correct surgical intervention, the reinnervation process has a speed of 1-2 mm/day (so 30 months from site of rupture towards peripheral); nevertheless, the functional recovery depends upon the precocity and continuity of the rehabilitation program.

References

1. DeLisa J. et al. Physical Medicine and Rehabilitation. Principles and Practice. Lippincott, Williams & Wilkins, Fourth Edition, 2005.
2. The UEMS PRM Section and Board and the Academie Europeene de Medecine de Readaptation. White Book on Physical and Rehabilitation Medicine in Europe, Europa Medicophysica vol.42,no.4, dec.2006.

Benefits of hand rehabilitation program and ergotherapy after carpal tunnel release

C. Brailescu, R.G. Scarlet, A.S. Nica, G. Mologhianu, A. Murgu
 National Institute of Rehabilitation, Physical Medicine and Balneoclimatology Bucharest, Romania, Carol Davila University of Medicine, Bucharest, Romania

Introduction. The purpose of this study is to analyze the efficiency of the physical therapy in the functional rehabilitation of the patients with carpal tunnel syndrome after surgical intervention. **Materials and methods.** In the National Institute of Rehabilitation and Physical Medicine there is a great addressability for hand therapy, a lot of patients being guided to us by the plastician surgeons (aprox. 10 patients per week). Our study has been developed on a period of 3 months (May 2009 - August 2009), with a total of 60

patients. We evaluated the patients using classic clinical and functional scales (pain, mobility, quality of life - Daily Living Activities score), at the beginning and at the end of the hand therapy programme (10 daily treatment sessions). Most of the patients could have been followed in dynamic through several sessions of physical treatment and ergotherapy sessions. For the final evaluation and analysis we used specific functional scales such as Carpal Tunnel Syndrome Symptom Severity Scale. **Results.** After the completion of the rehabilitation programme we observed that there is an improvement in the functional status of the hand after carpal tunnel release. The effect of the treatment was better in patients with good treatment compliance. **Conclusion.** Evolution after rehabilitation treatment is better in patients who started rehabilitation program immediately after the surgical intervention and in those who followed several physical treatment and ergotherapy sessions.

References

1. DeLisa J. et al. PhysicalMedicine and Rehabilitation. Principles and Practice. Lippincott, Williams & Wilkins, Fourth Edition, 2005
2. The UEMS PRM Section and Board and the Academie Europeene de Medecine de Readaptation. White Book on Physical and Rehabilitation Medicine in Europe, Europa Medicophysica vol.42,no.4, dec.2006

Traditional and modern concepts about hand prosthesis

C.M. Brailescu¹, R.G. Scarlet¹, A.S. Nica¹, G. Mologhianu¹, A. Murgu¹, I. Lascar²

¹National Institute of Rehabilitation Medicine, Bucharest
²Floreasca Emergency Hospital Bucharest, Plastic Surgery Department "Carol Davila" University of Medicine, Bucharest, Romania

Introduction. "The hand is an extension of the human brain" (Immanuel Kant) and is the expression of our personality and integration in the environment, that's only some of the reasons for people to be in a continuous quest for finding new methods for hand rehabilitation. The hand is an amazing organ of versatility and dexterity. Not only can it be used to grasp everyday objects such as balls and pens, but it also can perform delicate maneuvers such as those performed by the skilled hands of a surgeon. **Materials and methods.** The field of prosthetics has been around for thousands of years, dating back to the early Egyptians. Hand assistive devices have evolved slowly, however, with a basic cosmetic, and only minimally functional design persisting until very recently. The need for prosthetics has been growing, with over 50,000 amputations every year in the US. Recent technological advances have sparked great interest and hope for more functional assistive devices for hand rehabilitation that can be controlled with the mind. **Conclusion** This poster wants to be a peer-review of the history of the assistive devices used for hand rehabilitation, from ancient times till now (i-hand, HandTutor, virtual reality) and also an useful classification for actual hand prosthesis used nowadays to reach the supreme aim: a functional and independent hand, with readaptation for socio-professional life.

References

1. DeLisa J. et al. PhysicalMedicine and Rehabilitation. Principles and Practice. Lippincott, Williams & Wilkins, Fourth Edition, 2005
2. The UEMS PRM Section and Board and the Academie Europeene de Medecine de Readaptation. White Book on Physical and Rehabilitation Medicine in Europe, Europa Medicophysica vol.42,no.4, dec.2006

Study regarding the use of ergotherapy in Geriatric Rehabilitation

C.M. Brailescu, R.G. Scarlet, G. Mologhianu, A. Murgu, A.S. Nica
 National Institute of Rehabilitation Medicine, Bucharest, "Carol Davila" University of Medicine, Bucharest, Romania

Introduction. The "aging" process, as an integrative life concept (which considers the age not a disease and not a disability per se) is associated with physiological progressively changes, which are the cause for the increase of the prevalence of acute and chronic diseases and for a greater incidence of disabling conditions for the elderly.

Materials and methods. We studied a lot of 50 geriatric patients (between 70 and 93 years old) which are hospitalised in the Jewish Community Hospice in Bucharest, Romania and which were screened for a 6-months period, between March and October 2009. The challenge of this study was the multiple pathologies and co-morbidities of this patients, that's why the classic daily rehabilitation program needed to be very well individualised. The ergotherapy session as ADL-derived exercises, craft or vocational oriented skills, simple

occupational therapy were also included in the daily program, 30 minutes/day, six months. We evaluate the patients before and after the study, using the traditional MIF scores and the QUALEFFO scores. **Results.** The results proved the efficacy of the ergotherapy for improvement of MIF and QUALEFFO scores, with better clinical and functional status of the patients, with greater independence for ADLs and social integration; the study showed also, a benefit as a secondary prophylaxy – lesser complications or acutizations of the chronic conditions, better effort capacity for daily activities and better psychological status. **Conclusion.** The actual trend is to give a great importance to the Geriatric Rehabilitation, which means not only recovery after special medical conditions (stroke, hip fracture), but also means preventive rehabilitation programs, dedicated to the earlier stages of the elderly most common pathologies, in order to stop their evolution or to diminish their severity and complications.

References

1. DeLisa J. et al. PhysicalMedicine and Rehabilitation. Principles and Practice. Lippincott, Williams & Wilkins, Fourth Edition, 2005
2. The UEMS PRM Section and Board and the Academie Europeene de Medecine de Readaptation. White Book on Physical and Rehabilitation Medicine in Europe, Europa Medicophysica vol.42,no.4, dec.2006

Skin microvascular blood flow during walking using lower body positive air pressure

Hiroshi Kuroki¹, Yusuke Torii¹, Koji Tsuchimoto¹, Hiroyuki Inoue¹, Mikiko Kobayashi Miura¹, Ryoshuke Kakinoki², Hiroshi Ieki³, Toshihiro Morinaga⁴, Masahiko Kobayashi⁵, Yasuaki Nakagawa⁶, Manabu Nankaku², Takashi Nakamura⁵

¹Department of Motor function Analysis, Graduate School of Medicine, Kyoto University, Japan
²Department of Rehabilitation Medicine, Kyoto University Hospital, Kyoto University Japan
³Gunze Co.Ltd., Osaka, Japan
⁴Shijo-Nawate Gakuen University, Japan
⁵Department of Orthopaedic Surgery, Graduate School of Medicine, Kyoto University, Japan
⁶Department of Orthopaedic Surgery, National Hospital Organization Kyoto Medical Center, Japan

Introduction. We developed a device for partial weight-bearing walking using lower body positive air pressure (LBPP), which consists of a treadmill and an elevating system of the treadmill in a LBPP chamber. Recently, Cutuk reported cardiovascular safety in walking using the LBPP. However, no researchers focus on skin microvascular blood flow (SMBF) of lower leg and thigh, which undergo the LBPP. Purpose of this study was to compare the SMBF in the lower leg and thigh between LBPP and no-LBPP. **Materials and methods.** Three healthy volunteers who gave informed consent were participated in the study. Systolic blood pressure, diastolic blood pressure, heart rate, number of steps and SMBF of lower leg, thigh and forehead were measured during walking at a speed of 4 km/hr with LBPP (5 and 6.7 kPa) and without LBPP (0 kPa). Result: LBPP at 5 kPa and 6.7 kPa reduced body weight to 38% and 25%, respectively, but had no harmful effect on systolic blood pressure, diastolic blood pressure, heart rate and number of steps. SMBF at 0, 5 and 6.7 kPa was 44.3, 39.9 and 34.1 ml/min in the lower leg, respectively, 60.4, 52.8 and 47.6 ml/min in the thigh, respectively, and 14.1, 13.1 and 13.2 ml/min in the forehead, respectively. **Results.** LBPP at 5 kPa and 6.7 kPa reduced body weight to 38% and 25%, respectively, but had no harmful effect on systolic blood pressure, diastolic blood pressure, heart rate and number of steps. SMBF at 0, 5 and 6.7 kPa was 44.3, 39.9 and 34.1 ml/min in the lower leg, respectively, 60.4, 52.8 and 47.6 ml/min in the thigh, respectively, and 14.1, 13.1 and 13.2 ml/min in the forehead, respectively. **Conclusion.** Although LBPP settings slightly reduced SMBF, the ratios were not so high and acceptable. Further study will reveal whether the walking using LBPP is a useful device for partial weight-bearing walking in clinical settings.

References

1. Kuroki H, et al. Development of float walking assist using air pressure. Proceedings of World Physical Therapy 2003, abstract 1073, Barcelona.
2. Cutuk A, et al. Ambulation in simulated fractional gravity using lower body positive pressure: cardiovascular safety and gait analyses. J Appl Physiol 101: 771-777, 2006.

Lung Transplantation: Bone Mass Loss at Risk?

M. Ribeiro da Cunha, L. Diamantino
Hospital de Santa Marta, Centro Hospitalar de Lisboa Central, EPE

Introduction. Osteoporosis is a recognized lung transplantation complication, which can diminish quality of life by increasing fracture's risk. This study's aim was to determine the correlated degree of bone mass loss and its main best predictors. **Materials and methods.** Prospective study, including all patients who underwent lung transplant at Santa Marta's Hospital from January to October 2009 (n=7). Demographic and clinical data collected; DEXA used to determine BMD and T score values at lumbar spine (LS) and proximal femur (PF) pre and post-transplant (average interval one year). Several risk factors were correlated, including cumulative steroid dose. Statistical analysis was performed by SPSS v.13, using exact and non-parametric tests *Spearman's rho* and *Wilcoxon*. A six months follow up is being held, with DEXA being redone. **Results.** Patients mean age 43 years old, 57% women, BMI average 23.58 kg/m², six months post-transplant average time. Prior to transplant, all patients underwent corticosteroid chronic therapy. The average cumulative steroid dose until the post-transplant DEXA was 18894 mg of prednisolone. There was no statistical significant change in densitometric values despite a LS and PF BMD reduction of 2.8 and 6.4%, respectively. No significant statistical correlation was obtained, although the results between BMD and T score changes at LS and cumulative steroid dose have been respectively $p=0.052$ and 0.058 . Post-transplant osteoporotic vertebral fractures were found in one patient. Follow-up results will be ready by April 2010. **Conclusion.** Health professionals should not overlook Osteoporosis monitoring, prevention and treatment in order to avoid complications that may worsen the well-being of these patients.

References

Spira, A. et al. Osteoporosis and Lung Transplantation. *Chest*; 2000; 117; 476-481.
 Ferrari, S.L. et al; "Osteoporosis in patients undergoing lung transplantation"; *Eur Respir J*; 1996; 9; 2378-2382.
 Aris, R.M. et al; "Severe Osteoporosis Before and After Lung Transplantation"; *Chest*; 1996; 109; 1176-1183.

Bilateral brachial plexopathy while walking in the Camino de Santiago

R. Fiorillo, C. Fernandez-Caamaño, V. Lourido-Estevéz, J. Muñoz-Mateo
Rehabilitation Service. Complejo Hospitalario de Pontevedra. Pontevedra. Spain

Introduction. Brachial plexus injuries carrying backpacks is well known in the military population. A poor development of the shoulder musculature and previous anomalies or injuries in the shoulder have been proposed as predisposing factors in compressive brachial neuropathy. **Case report.** A 15-year-old girl without remarkable familiar and personal history presented to the Emergency Department with acute weakness and numbness of upper limbs presented after an hour of walking with a backpack. The initial examination showed a girl of thin constitution with inability to raise both upper limbs, to make flexion and extension of both elbows, hypoaesthesia and bicipital and tricipital areflexia. Analytic (including cerebrospinal fluid) and radiologic assessment didn't show significant alterations. Electromyography was consistent with brachial plexopathy with predominant affection of C5-C6-C7 roots. Corticoid therapy was initiated. The patient was evaluated by the Rehabilitation Department 2 days after the hospital admission initiating a prompt rehabilitation program. **Discussion.** Most of the backpack palsies consist in injury of C5-C6 roots of the brachial plexus. Symptoms include numbness, paralysis and minor pain in the shoulder girdle, elbow flexors and wrist extensors. A prompt rehabilitation program is important for the maintenance of the range of movement and muscle trophism. Backpack palsy has been widely reported in association with load carriage in subjects without underlying medical conditions. However, "Hereditary Neuropathy with Susceptibility to Pressure Palsies" has to be ruled out especially when this condition appears in the context of carrying light loads.

References

1. Soldier load carriage: historical, physiological, biomechanical, and medical aspects. Knapik JJ, Reynolds KL, Harman E. *Mil Med*. 2004 Jan;169(1):45-56.
 2. Mäkelä JP, Ramstad R, Mattila V, Pihlajamäki H. Brachial plexus lesions after backpack carriage in young adults. *Clin Orthop Relat Res*. 2006 Nov;452:205-9.
 3. Brachial plexopathies: classification, causes, and consequences. Ferrante MA. *Muscle Nerve*. 2004 Nov;30(5):547-68.

Ulnar entrapment neuropathy treatment: sonographic and clinical evaluation

S. Popescu, D. Cinteza, D. Poenaru, M. Sidere, G. Galbeaza, V. Marcu, S. Diaconescu, A. Dima, A. Tudosie
INRMFB

Introduction. Cubital tunnel syndrome is the second most common compressive neuropathy, the elbow being the most common site of compression. **Objective.** To demonstrate the efficiency of complex rehabilitation treatment for cubital tunnel syndrome. **Design.** Prospective, randomized, controlled study. **Materials and methods.** There were selected 12 patients with cubital tunnel syndrome with moderate severity. We used DASH questionnaire for the assessment of severity of symptoms and electromyographic and sonographic exam. Sonographic examination of cubital tunnel was directed towards ulnar nerve CSA (cross-sectional area) measurement. For patients with moderate symptoms we found a CSA between 8 and 10 mm². Patients were randomly divided in two groups. All patients received NSAID and local applications of therapeutic laser and therapeutic ultrasound (three times a week for four weeks). Patients from group B received also an elbow orthosis (to be worn at night time for 4 weeks). Clinical, electromyographic and sonographic assessment was done at the beginning of the study. At the end of the treatment patients were assessed clinical and sonographic. **Results.** Complex rehabilitation treatment (laser, ultrasound and elbow orthosis) proved to be efficient in symptoms control. Comparing the results from group A and group B we found that the improvement was significant for patients from group B. **Conclusion.** Conservative treatment in cubital tunnel syndrome proved to be effective when local treatment is associated with nocturnal wearing of an elbow orthosis.

References

1. Chiou HJ, Chou YH, Cheng SP. Cubital tunnel syndrome: diagnosis by high-resolution ultrasonography. *J Ultrasound Med* 1998
 2. Park G-Y, Kim J-M, Lee S-M. The ultrasonographic and electrodiagnostic findings of ulnar neuropathy at the elbow. *Arch Phys Med Rehabil* 2004

Functional Electrical Stimulation to Enhance Walking Abilities

F. Molteni, E. Guanziroli, M. Colombo, G. Togni, C. Gramigna
Rehabilitation Centre "Villa Beretta", Valduce Hospital Como

Introduction. Foot-drop is a common gait impairment on the Upper Motor Neuron Syndrome (UMNS). Functional Electrical Stimulation (FES) of the ankle dorsi-flexors muscles during swing phase of gait can help to correct foot-drop. The FES effect is not only limited to a peripheral level but such effect is associated to a cortical reorganization [1-2]. The aim of this study is to verify the FES efficacy in comparison with standard condition of walking (with or without orthosis). **Materials and methods.** 10 UMNS patients with foot-drop and indication for FES were recruited. Kinematic assessment (3D gait analysis), 50 meters walking test (50MWT) and 6 minutes walking test (6mWT) were performed in gait standard condition (shoes or shoes and orthosis) and with FES. Spatio-temporal, kinematic and kinetic gait parameters, stride length, self-selected speed (50MWT) and endurance (6mWT) were compared in the two different conditions. **Results.** Results showed an increase of self-selected velocity, cadence, swing velocity, stride length, ankle dorsi-flexion in terminal stance and in swing phase, knee and hip flexion in heel contact phase, hip power generation, reduction of step width, hip flexion in terminal stance, better trunk control and loading response with FES. 50MWT showed an increase of stride length and self-selected speed; 6mWT showed endurance increase. **Conclusion.** FES stimulation is effective to enhance walking abilities in subjects with foot-drop due to UMNS. Further evaluation are required to evaluated long term benefits.

References

1. Stein RB, Everaert DG, Thompson AK, Chong SL, Whittaker M, Robertson J, Kuether G.; Long-term therapeutic and orthotic effects of a foot drop stimulator on walking performance in progressive and nonprogressive neurological disorders; *Neurorehabil Neural Repair*. 2010 Feb;24(2):152-67. Epub 2009 Oct 21.
 2. Everaert DG, Thompson AK, Chong SL, Stein RB.; Does functional electrical stimulation for foot drop strengthen corticospinal connections?; *Neurorehabil Neural Repair*. 2010 Feb;24(2):168-77. Epub 2009 Oct 27.

Clinical and Instrumental Seating Evaluation in Patients with Major Disabilities: a pilot study

M. Colombo, D. Biacchi, F. Molteni, E. Guanziroli, M. Pascoli
Rehabilitation Centre "Villa Beretta", Valduce Hospital Como

Introduction. Central Nervous System (CNS) pathologies, whether congenital or acquired, change the ability to control seating posture due to progressive alterations of body structure, and/or body function, producing limitations in activity and participation [1]. The aim of this pilot study is to identify, through clinical and instrumental assessments, some parameters that could be used for clinical decision making about feasible solutions that may ensure the best possible seating posture in severely disabled people. **Materials and methods.** 16 patients with major disabilities referred to Seating Clinic of Villa Beretta were evaluated in order to define their specific needs for changing their own seating system. Clinical and instrumental assessment of skin contact surface pressure, respiratory functionality, neuromuscular activity of targeted muscles and care burden were used to compare different solutions. **Results.** The decision on the seating system new support was taken depending on the improvement of contact area in seating and in backrest, the improvement of Tidal Volume, the reduction of caregiver care burden, and the change of EMG pattern in targeted muscles. **Conclusion** Data collected for this pilot study was treated through a multifunctional analysis of the seating dynamic condition in patients with major disabilities [2]. Based on changes in body structure and body functions it has been possible to identify the best solutions to improve quality of life and social participation.

References

1. Intentional Classification of Functioning, Disabilities and Health, World Health Organization, Geneva, 2002
2. Neilson AR, Bardsley GI, Rowley DL, Hogg J, Malek M, Morrison GC, Kirkwood CA. Measuring the effects of seating on people with profound and multiple disabilities-a preliminary study; *Journal Rehabil Res Dev.* 2001; 38(2):201-14.

Acceptance of SPL KAFO in patients with Post Polio Syndrome

F. Molteni, M. Rossini, E. Guanziroli, L. Magoni, D. Biacchi
Rehabilitation Centre "Villa Beretta", Valduce Hospital Como

Introduction. Post Polio Syndrome (PPS) refers to a clinical disorder affecting polio survivors with sequelae years after the initial polio attack. These patients report new musculoskeletal symptoms, loss of muscular strength or endurance [1]. Generally these patients reject the use of a rigid Knee-Ankle-Foot-Orthosis (rigid KAFO) because they do not accept a limitation of performance. The introduction of a SPL KAFO that preserve the flexion of the knee during the swing phase give a reasonable arrangement in terms of velocity, pain reduction and safety [2]. **Materials and methods.** 6 PPS patients with an indication to use a SPL KAFO were asked to perform a gait analysis in three different situations: performing gait in standard condition (shoes or shoes and personal aids), performing gait using SPL KAFO at the end of the training session and after 1 year of daily use of the device. Spatio-temporal, kinematic, kinetic gait parameters, were compared in the three conditions. **Results.** Results showed a stability or at least a little decreasing of self selected velocity and other spatio-temporal parameters and an improvement of knee kinematic and kinetic data. Sometimes the results obtained during the second session were confirmed in the long term (1 year) session. **Conclusion.** Even if the results do not show an important increase in gait performance outcomes, the tolerance of the patient after one year shows that the improvement in stability and the preservation of musculoskeletal structure along with the possibility to perform a physiological gait pattern represent a peculiar aspect that has to be taken into consideration when the acceptance of the orthosis by PPS patients is at stake.

References

1. Boyer FC, Tiffreau V, Rapin A, Laffont I, Percebois-Macadré L, Supper C, Novella JL, Yelnik AP. Post-polio syndrome: Pathophysiological hypotheses, diagnosis criteria, medication therapeutics. *Ann Phys Rehabil Med.* 2010 Feb;53(1):34-41. Epub 2009 Dec 31.
2. Moreno JC, Brunetti F, Rocon E, Pons JL. Immediate effects of a controllable knee ankle foot orthosis for functional compensation of gait in patients with proximal leg weakness. *Med Biol Eng Comput.* 2008 Jan;46(1):43-53. Epub 2007 Oct 10.

Determining Changes and Structural Malalignment in the Spine of Trans-Femoral Amputees Using Prosthesis

Authors
Hossein Assiabi, Shahin Goharpey, Karimloo, Navid Taheri
Rehabilitation School of Isfahan University of Medical Sciences, Esfahan, Iran

Introduction. Restoring the function of lower limb by using proper prosthesis is the first aim of rehabilitation in transfemoral amputation. Due to loss of knee, ankle, and footin amputee, the gait of the subject is not smooth. A patient walking on prosthesis is completely dependent on compensating mechanisms to adapt himself with the environment and prosthesis. Although, the otcome of this adaptation is capability to move again, due to compensation mechanisms which human physical structure is not made for it, there might be some unwanted consequences¹. The aim of this study was to determine these consequences in the spinal column. **Materials and methods.** A cross sectional descriptive study carried out on 23 men aged between 30 to 45 years,with unilateral trans-femoral amputation who had used prosthesis for at least 10 years were studied. Their anteroposterior and lateral viwes of lumbar and thoraco-lumbar regions were analyzed and the strength of hip muscles were assessed and recorded using dynamometer. **Results.** The shortness of prosthesis for 1 cm or more, caused pelvic and spinal deviation. These malformations had direct relationship with the amputated limb being left or right², but there was no relationship between lateral spinal deviation and hip muscles strength. The lordotic and sacral angles increased in all cases. **Conclusion.** The aim of prescribing prosthesis is to restore patient's movement and independence. In the production and prescription of lower limb prosthesis, normal gait and movement is not the only factor to be considered but the impact of prosthesis on other areas of the patient's body should be also taken into account.

References

1. Gailey R, Allen K, Castles J, Kucharik J, Roeder M. Review of secondary physical conditions associated with lower-limb amputation and long-term prosthesis use. *J Rehabil Res Dev.* 2008;45(1):15-29.
2. Lee RY, Turner-Smith A. The influence of the length of lower-limb prosthesis on spinal kinematics. *Arch Phys Med Rehabil.* 2003 Sep;84(9):1357-62.

Is the treatment of muscle-skeletal support swallowing structures useful to facilitate rehabilitation of neurogenic dysphagia?

L. Crescini, L. Medici, F. Noro, A. Testa, S. Galeri
"E. Spalenza" Rehabilitation Centre, Fondazione Don Gnocchi, Rovato (Brescia)

Introduction. This study aims to identify multidisciplinary strategies that can help dysphagia logopedic treatment by improvement of ROM, muscle tone, perception of swallowing support structure, mainly cervical spine. **Materials and methods.** 10 patients, studied in rehabilitation centre "E. Spalenza" Fondazione Don Gnocchi. Patient were affected by neurogenic dysphagia after cerebrovascular disease. **Inclusion criteria:** recent stroke (within 30 days). GCS >12; MMSE >24. Trunk Control Test > 48. No ventilation support

Exclusion criteria: neurodegenerative dysphagia; severe cervical or temporo-mandibular disease; gavage or feeding tube. Treatment group: active and passive mobilization of cervical spine, daily, for 30 minutes, lasting four weeks; the physiotherapeutic treatment was provided just before the logopedic treatment for dysphagia. Control group: logopedic treatment for dysphagia, daily, without previous physiotherapeutic treatment. **Results.** Active and passive cervical ROM: improved in treatment group. Cervical muscle strength: no differences in treatment and control group. Diet level: Improved in treatment group. **Conclusion.** Multidisciplinary treatment of dysphagia seems to improve rehabilitation outcome in dysphagia after cerebrovascular disease.

References

- Shindler O, Ruoppolo G, Shindler A. *Deglutologia*, Edizioni Omega, Torino, 2001.
- Ursino F, Fattori B., Matteucci F., Ghilardi P.L., "Approccio multidisciplinare ai disturbi della deglutizione", Atti del convegno di Pisa 30 Aprile 2005, Ed. Plus-Pisa University Press, 2005.

Effectiveness of exercise therapy in hip osteoarthritis: a pragmatic randomized controlled trial

Riikka Juhakoski¹, Seppo Tenhonen¹, Antti Malmivaara², Vesa Kiviniemi³, Tapio Anttonen⁴, Jari PA Arokoski⁵

¹Department of Physical and Rehabilitation Medicine, Mikkeli Central Hospital, Mikkeli, Finland, Department of Physical and Rehabilitation Medicine, Mikkeli Central Hospital, Mikkeli, Finland

²Centre for Health and Social Economics, Institute for Health and Wellbeing, Helsinki, Finland

³IT Centre, University of Kuopio, Kuopio, Finland

⁴Mikkeli Health Center, Mikkeli, Finland

⁵Department of Physical and Rehabilitation Medicine Kuopio University Hospital, Kuopio Finland and Institute of Clinical Medicine, University of Eastern Finland, Kuopio, Finland

Introduction. There is a lack of data to support the putative benefits of exercise programs associated with hip osteoarthritis (OA)¹. The objectives of this study were to evaluate the short-term and long-term effectiveness of exercise training in relation to pain, function and some cost to health care providers attributable to hip OA over the two year follow up period. **Materials and methods.** 120 men and women aged from 55 to 80, with radiologically diagnosed hip OA with associated clinical symptoms were randomized between combined exercise plus general practitioner (GP) care or GP care only. Primary outcomes were change in hip pain and function (WOMAC OA Index) and Physical Component Summary (PCS) score of RAND-36 (SF-36). The use and health care providers costs of doctor visits and physiotherapy associated with hip OA and need for total hip replacement surgery were analyzed and the use of analgesic and non-steroidal anti-inflammatory drugs (NSAID) were calculated. Secondary outcomes included performance based outcome scores and body mass index (BMI). **Results.** There were no differences between the groups with respect to WOMAC hip pain, PCS score, performance based outcome scores or BMI. The effect of the exercise intervention on WOMAC function was statistically significant at 6 (mean=-7.5;95%CI=-13.9- -1.0;p=0.02) and 18 (mean=-7.9;95%CI =-15.3- -0.4;p=0.04) months time points. There were no statistically significant differences in the total health care providers costs between the groups. The use of NSAIDs at the 12 and 18 months time points favoured the combined exercise and GP care group. **Conclusion.** The mostly home based exercise training program did not result significant effect on disease-specific pain or generic physical health. However, this program may confer slight long-term beneficial effects in hip-related physical function.

References

1. Fransen M et al. Exercise for osteoarthritis of the hip. Cochrane Database of Systematic Reviews 2009.

Relevance of presurgical and early rehabilitation education to improve the outcome in hip replacement

J. Sanchez Raya, E. Pagés, A.M. Leon Espitia

Institution: Hospital Universitario Vall d'Hebron, Barcelona, Spain

Introduction. In 2008 we implemented a presurgical multidisciplinary rehabilitation program destined to patients undergoing hip replacement, with the objective to evaluate a positive influence to drop down the length of stay and to increase the obtained benefits of physiotherapy and to take them to a faster adjustment to their normal life activities. **Materials and methods.** We evaluated all patients who underwent a hip replacement between March and December 2008. The presurgical multidisciplinary rehabilitation program included: an informative conference for the patient and his family given by a multidisciplinary team constituted by Traumatology and Orthopedic surgeons, Physiatrists, Physiotherapists, Occupational Therapists, Nurses and Social workers, who familiarized the patient with the procedure, the rehabilitation program and the hospital social resources; and a second intervention 24 hours prior to the surgery to teach them the exercises to be made from recovery until hospital discharge. We analyzed length of stay, time of inpatient and outpatient rehabilitation, need of domiciliary rehabilitation, discharge destination and Hip Harris Score. **Results.** 201 patients with an average age of 65 years were evaluated. 87% of patients had hip arthrosis, 55.2% received presurgical information, and 60% presurgical physiotherapy. Average length of stay was 9.4 days with 5.6 days of inpatient rehabilitation. 88% went home and 14% had domiciliary rehabilitation. Patients who received informative conference went in a higher percentage to presurgical physiotherapy ($p \leq 0.01$) and those who didn't were more

discharged to a convalescent rehabilitation unit ($p < 0.001$). There were no other significant differences between both groups.

Conclusion. The presurgical multidisciplinary rehabilitation program doesn't decrease the length of stay but can modify discharge destination of patients by giving them more confidence about the rehabilitation program and their return at home. The program also offers a better quality of hospital services.

Age structure of children in south serbia region included in motoric development follow-up

J. Ljubic¹, I. Petronic², D. Nikolic², Z. Jelic³, L. Ilic-Jovic¹, L. Spasic¹

¹Leskovac General Hospital, Leskovac, Serbia

²Physical Medicine and Rehabilitation Department, University children's Hospital, Belgrade, Serbia

³Institute for Psychophysiological disorders, Belgrade, Serbia

Introduction: Timely diagnosis and prompt treatment are important factors in infants and children with developmental delay. Aim of our study was to evaluate age structure of children in south Serbia region that were included in motor development follow-up survey.

Material and methods: In our study we included 679 children with motoric delay that were treated at Physiatric department of General hospital in Leskovac over the period of 2 years. All participants were classified into 3 groups due to age: first group included those younger than one month of life, second group included those between 1 and 3 months of life and third group was composed of those that were older than 3 months of life.

Results: In the first group we had 163 (24%) children or every fourth child, in the second group 365 (53.76%) children, while in the third group there were 151 (22.24%) children. Children from second group were significantly frequent while there wasn't significant difference between frequencies in first and third age groups.

Conclusion: Our results stress out that there is great need of educating the parents regarding necessity of regular health check-ups of their offspring in order to diagnose timely motoric delay. Early treatment is essential in order to obtain optimal results of motoric facilitation.

The Comparison of the effects of local corticosteroid injections applied with physical therapy and only physical therapy modalities on hemiplegic shoulder pain.

Tuba Baykal¹, Dursun Kaya², Kazim Şenel¹

¹Ataturk University, Faculty of Medicine, Department of Physical Therapy and Rehabilitation, Erzurum, Turkey

²Ataturk University, Vocational College of Erzurum, Turkey

Introduction. Hemiplegic shoulder pain after stroke can occur 16-85 % of the patients. Nevertheless the treatment strategies of hemiplegic shoulder pain still hosting some disagreement. This study was performed to compare the effects of local corticosteroid injections applied with physical therapy and only physical therapy modalities on hemiplegic shoulder pain. **Materials and methods.** Thirty hemiplegic stroke patients with shoulder pain caused by adhesive capsulitis and impingement syndrome were randomized into two groups. One of the groups received local corticosteroid injection and physical therapy modalities, whereas the other group received only physical therapy. Physical and exercise therapy were applied 3 weeks (5 days of week) to both of the groups. Clinical outcome measurements were pain, shoulder range of motion, motor development, spasticity and functional development. We used visual analogue scale for pain, goniometric measurement for range of motion, Brunnstrom staging for motor development, modified Ashworth scale for spasticity and functional independence measurements for functional assessment. Measurements were made at baseline, first week of the treatment and 4 weeks after the treatment for all patients in the two groups. **Results.** We acquired significant improvement for pain, range of motion, motor development, spasticity and functional independence in both groups by time. However there were no statistically significant difference between two groups. **Conclusion.** This study suggests that, local corticosteroid injection and physical therapy combination do not present any superiority to only physical therapy modalities on hemiplegic shoulder pain.

References

- Tuba Baykal, Dursun Kaya, Kazim Şenel. The Comparison of effects of local corticosteroid injections applied with physical therapy and only physical therapy modalities on hemiplegic shoulder pain.

Accuracy of diagnosis of vegetative state in long-term survivors of acquired brain injury

G.F. Lamberti¹, V. Carle¹, N. Aimonino Riccauda², E. Antoniono¹, R. Carlucci³, A. Mastromattei⁴, N. Nicoletti³, M.F. Stasi¹, V. Tibaldi¹

¹S.C. *Neuroriabilitazione ASL CN1 - Cuneo*

²S.C.D.U. *Geriatria Ospedale Molinette - Torino*

³S.C. *Geriatria ASL TO2 - Torino*

⁴U.O. *Tutela Anziani Agenzia di Sanità Pubblica del Lazio*

Introduction. Numerous series have been published dealing with the prognosis of patients with vegetative state and with its misdiagnosis. Highlight early prognostic factors for the recovery of consciousness after vegetative state permit us to locate the correct rehabilitation and residential settings. **Materials and methods.** The medical records of all patients admitted to a Rehabilitation Unit for Vegetative State after traumatic and non traumatic injury over a 2 years period. 49 patients with a referral diagnosis of vegetative state due to acute onset brain damage were included, after a period in an intensive rehabilitation care coma facility with a history of 90 days or more of unconsciousness of nontraumatic cause and 180 days or more of traumatic cause. **Results.** Five patients (10%) recovered consciousness within 20 months of admission to a Rehabilitation Unit for Vegetative State. By 6 months after admission 4 patients (8%) were dead, the other 82% remained permanently unconscious. All 5 patients in this series who recovered consciousness remained with major disability: one has been diagnosed as incomplete Locked-in syndrome, one as complete Locked-in syndrome and three remained Minimal Conscious State. Among those who regained consciousness, young age, male sex and the presence of epileptic seizures have been identified as favorable predictors for awakening beyond vegetative state. **Conclusion.** Identification of awareness in the presence of profound and complex neurological disabilities requires the skills of a multidisciplinary team experienced in long term management of disability due to brain damage.

References

Schnakers C, Vanhaudenhuyse A, Giacino J, Ventura M, Boly M, Majerus S, Moonen G, Laureys S. Diagnostic accuracy of the vegetative and minimally conscious state: clinical consensus versus standardized neurobehavioral assessment. *BMC Neurol.* 2009;21:9-35.

Muscle activation pattern in patients with spinal cord injury AIS A and AIS B during robotic assisted walking

T. Ribeira, A. Lopes, S. Santos

Spinal Cord Rehabilitation Unit, Centro de Medicina de Reabilitação da Região Centro, Tocha, Cantanhede, Portugal.

Introduction. Spinal cord has the potential to generate rhythmic motor activity in a flexible, task-dependent manner. Pattern sensory inputs play a key role in facilitating and modulation the spinal rhythmic output. The aims of this study are to determine if there exists differences on lower limb muscle activation between subjects with clinically complete spinal cord injury and incomplete AIS B lesions, and to describe the pattern of muscle activation when compared to subject AIS D and healthy subject, during stepping on a robotic gait orthosis (RGO). **Materials and methods.** We recorded electromyography as 9 subjects (4 AIS A and 5 AIS B) walked on the robotic gait orthosis (Lokomat®) for 10 minutes with 70% unloading of their body weight, as well as 1 subject AIS D and a healthy subject for comparison. **Results.** AIS A and AIS B subjects revealed activation of lower limb muscles with different pattern from that of AIS D subject and healthy subject, and also diverse from those described by other authors. There was synchronous activation of Gastrocnemius and Tibialis Anterior on both lower limbs during right stance phase, and bilateral stance phase, but not during left stance phase. **Conclusion.** During stepping on RGO there is muscle activation though it is different from muscle activation generated in normal subjects. We didn't find significant differences between activation patterns in patients AIS A and B. In these patients, activation is especially done during right stance phase and bilateral stance phase. This aspect hasn't been described so far and cannot be explained, which makes it an interesting target for future studies.

References

V Dietz, R Müller, G Colombo. Locomotor activity in spinal man: significance of afferent input from joint and load receptors. *Brain* 2002;125:2626-2634.

A case of stroke in a patient with essential thrombocytemia and undifferentiated spondyloarthritis: an example of clinical complexity in physical medicine and rehabilitation

G.A. Checchia, A. Amato, A. Barbano, N. Camuzzini, G. Corvaglia, C. Lentino

Physical Medicine and Rehabilitation Unit, Santa Corona Hospital, ASL 2 Savonese, Pietra Ligure (SV) (Italia)

Anamnestic synthesis. Female 36 years old with history of particularly intense hips and knees pain, never evaluated, with daily assumption of 450 mgr of indometacine for 10 years. **Clinical course.** On 02/11/2006, cerebral left hemispheric ischemic stroke occurred with right hemiplegia and aphasia. Sheltered before in the neurologic unit, patient had been charged in our institution for rehabilitative cares on 17.11.2006. The hematologist, on the basis of clinical and laboratory (platelets > 1,300 X 10⁹/L) findings, has developed a diagnosis of essential thrombocytemia and recommended biopsy for dosing the Jak2 title. Biopsy has been refused by the patient. Rehabilitative treatment has been slowed by an intense right hip pain, by prolonged metrorrhagia (coexistence of uterine fibromas and LMW heparin therapy for thrombocytemia) and for the little collaboration of the patient. Having regard to the notable increase of the inflammatory indexes it has been performed various checks to evaluate a septic or inflammatory pathology and it was set the clinical suspect of seronegative undifferentiated spondyloarthritis confirmed by the RMN and started therapy with Methotrexate. Ever since has assisted to a clean improvement with reduction of the right hip pain and improvement of motor performances. Having regard to the persistence of thrombocytosis the hematologist recommended increasing Oncocarbid, checking weekly indexes of inflammation and hemochrome. **Follow-Up.** The patient has continued the rehabilitative treatment in our institution in DH regimen. Currently the patient shows still a notable degree of dependence in the ADL, but pain and musculoskeletal impairment is significantly reduced. It has been persisted an expressive aphasia, even with improvement of the comprehension, above all of contextual type.

References

Schafer AJ. Current concepts: thrombocytosis. *N Engl J Med* 2004;350: 1212-1219.
Sieper J; Braun J; Rudwaleit M; Boonen A; Zink A. Ankylosing spondylitis: an overview - *Ann Rheum Dis* 2002;61(Suppl 3):1108-1118

Deambulation following total hip arthroplasty: role of the rehabilitative taking in charge in the early hours

G.A. Checchia, A. Barbano, R. Carioti, A. Maggioni, N. Camuzzini, A. Amato

Physical Medicine and Rehabilitation Unit, Santa Corona Hospital, ASL 2 Savonese, Pietra Ligure (SV) (Italia)

Introduction. The development of new surgical techniques in THA leading a reduction of the surgical times and improvement in functional outcomes requires the maximal effort from the anesthesiologic team in order to guarantee the better post-operating pain control and from the rehabilitative team that must operate to assure an early walking improvement (1). **Materials and methods.** In the period between September 2006 and July 2009 they have today been evaluated and treated 79 patient aged 22 to 81 years within 6 hours from primary THA surgical intervention. The surgical team regarding patients clinical condition and pre operating planning, puts into practice the more opportune surgical technique (traditional or minimally-invasive). The rehabilitative evaluation was performed after six hours from the surgical intervention and in the cases when were possible (absence of important side effects of pain control, instability of the cardiovascular conditions) patients began an early rehabilitative program in order to get the more quickly possible standing and walking rehabilitation. **Results.** Early deambulation with 6 hours after THA was achieved in 59 patients, while standing alone was reached in 7 patients and only sitting in other 7 patients. Failure in early functional recovery was observed in 6 patients. **Conclusion.** In this 3 years experience it has noticed: a diminished embolisms incidence; patients face better the hospitalization and have been mostly stimulated to a more rapid functional recovery; normally in 2^o-3^o day all patients have been able to walk autonomously or with minimal assistance. This demonstrates that an early rehabilitation program is useful for better results in patients following THA.

References

1. Vincent KR et al Outcomes After Inpatient Rehabilitation of Primary and Revision Total Hip Arthroplasty. *Archives of Physical Medicine and Rehabilitation.* 2006;87:1026-1032.

Functional electrical stimulation improves upper limb recovery from hemiparetic stroke in subacute rehabilitation

G.A. Checchia¹, S. Fugazzaro², G. Morone³, D. Lenzi⁴, E. Urbano⁴, N. Betti⁵, G. Gualandri⁶

¹Physical Medicine and Rehabilitation Unit, Santa Corona Hospital, ASL 2 Savonese, Pietra Ligure (SV) (Italia)

²Physical Medicine and Rehabilitation Unit, Santa Maria Nuova Hospital, Reggio Emilia (Italia)

³Neurorehabilitation Unit, Santa Lucia Hospital IRCCS, Roma (Italia)

⁴LUCE Medical srl, Bologna (Italia); ⁵Fisioterapist; ⁶PM&R Specialist

Introduction. Few studies support functional electrical stimulation (FES) in acute stroke patients (1). Our purpose was to evaluate FES impact on upper limb's recovery in acute stroke rehabilitation. **Materials and methods.** 18 hemiparetic patients were randomised into 2 groups (9 cases and 9 controls) 2 weeks after stroke. At admission we assessed: upper limb motor impairment (Motricity Index), the active range of movements (ROM) of wrist, metacarpophalangeal and proximal interphalangeal joints, overall disability (Functional Independence Measure) and dexterity (Jebsen Test). Case patients underwent 30 minutes FES session per day for 3 weeks. Control patients underwent 30 minutes rehabilitation session per day with a physiotherapist for 3 weeks. All patients received 3 hour rehabilitation treatment everyday. The subjects were assessed for motor impairment and disability after treatment and 2 months later. Collected data were analysed by ANOVA. **Results.** After 15 FES sessions, case patients showed a better score in global active ROM for wrist and hand, in FIM and Jebsen Test. The statistical difference ($p < 0.05$) was still present at follow-up visit. No statistical difference was found in Motricity Index score. **Conclusion.** All parameters improved but hand's active ROM, FIM and Jebsen Test score increased significantly in patients who received FES. We concluded, therefore, that in subacute stroke patients, FES is useful to enhance motor recovery and to reduce disability.

References

1. Chae J. Neuromuscular stimulation for upper extremity motor and functional recovery in acute hemiplegia. *Stroke*. 1998;29:975-979.

The outcomes of rehabilitation in traumatic hand flexor tendon injuries

Ercalılık Tülay, Şahin Füsün, Erçalık Cem, Yücel Serap, Şirzai Hülya, Kuran Banu

Istanbul Şişli Etfal Training and Research Hospital Physical Therapy and Rehabilitation

Introduction. To evaluate outcomes of rehabilitation instituted after traumatic hand flexor injuries. **Materials and methods.** The study enrolled 65 patients who had undergone surgical management after hand flexor tendon injuries. Demographic characteristics, dominant hands, number of fingers affected, accompanying neurovascular injuries, and traumatized zones were recorded. Fourteen sessions of conventional physical therapy and application of splints whenever required were performed. At the baseline and at 8 weeks, ROMs were measured, and evaluated according to Buck-Gramcko scoring system. For the evaluation of functional hand disability Duruöz Hand Index (DHI) and Disabilities of Arm, Shoulder and Hand Questionnaire (DASH), and for the assessment of levels of psychological vulnerability The Impact of Event Scale (IES) were used. **Results.** Hundred and forty fingers of 52 male, and 13 female patients were evaluated. Mean age of our patients was 30.25 ± 11 years, and average time passed since the operation was 4.92 ± 1.3 weeks. Median nerve injuries in 13, ulnar nerve injuries in 9, and combined median and ulnar injuries in 7 patients were detected. In our patients, zone 1 (n= 8) , 2 (n= 14) 3 (n= 9) , 4 (n= 1), and 5 (n= 33) injuries were found Results of Buck-Gramcko assessment system were detected to be excellent for 58 %, and fair-moderate for 30 % of the fingers. Mean baseline DHI, DASH values were found to be statistically significantly higher than those of the control values ($p=0,0001$). Mean baseline values for DHI and DASH were 31.18 ± 14.95 and 40.35 ± 17.71 , while corresponding scores at 8 weeks 8.91 ± 11.5 and 12.04 ± 12.35 points, respectively. Psychological vulnerability state was evaluated as severe in 25, and moderate in 26 % of our patients. **Conclusion.** Rehabilitation program applied after flexor tendon repair is very important for the recovery of hand functions. The patients are also affected psychologically because of traumatic events.

Correlation between muscular vertebral pain in adult patients and acute dorsal kyphosis: Clinical aspects and therapeutic options

S. La Maestra¹, C. La Maestra², G. Vermiglio³, A. Terranova¹, M. Vermiglio¹

¹Università Messina Policlinico "G. Martino"

²IOMI "F. Scalabrino" Messina

³Solarium S.r.l. Trapani

⁴Fisiosanisport S.r.l. Messina

Introduction. Acute dorsal kyphosis is defined as the accentuation of a physiological curve of the sagittal plane which exceeds 48 degrees Cobb. This is found in children and adolescents and if not treated correctly before the end of the growth phase can frequently lead to adulthood dorsal and lumbar pain. **Materials and methods.** 600 patients affected by acute dorsal kyphosis were observed between January 2008 and January 2009. Subsequently 20 patients were selected. All selected patients shared the following characteristics: a mean age of 25, vertebral pain and x-rays which did not demonstrate signs of arthrosis and/or intervertebral disk pathology. All patients were evaluated and treated with postural re-education and anti-gravity resin corsets. **Results.** The results of the study demonstrated that 80% of patients experienced a reduction in pain and an improvement in posture following treatment. **Conclusion.** A combined treatment of postural re-education and corset is demonstrated to be an excellent form of prevention against adulthood vertebral pain.

References

1. Negrini S. L'ipercifosi e le patologie del rachide dorsale 2003;10:25.
2. Boachie-adjie C., Lonner B. Spinal deformity Pediatric Clinics of North America. 1996;43.
3. Bunnel WP. Outcome of spinal screening. *Spine* 1993;18 (12):1572-80.
4. Calza A, Tognolo M. Il trattamento chinesiológico del dorso curvo. Villaverla (VI): PPS Ed., 1999.
5. Negrini S, Sibilla P. Le deformità vertebrali: stato dell'arte, 2001, 129-48 .
6. Rainero G. Trattamento ortesico secondo la scuola della Fondazione Don Carlo Gnocchi di Milano. In: Negrini S, Sibilla P, eds. Le deformità vertebrali: stato dell'arte. Vigevano: Gruppo di Studio della Scoliosi, 2002;2:150-5.

Effects of Nd YAG laser therapy and eccentric exercises in the treatment conducted on housewives with chronic lateral epicondylitis

G. Vermiglio², A. Terranova¹, S. La Maestra³, M. Vermiglio¹

¹Università Messina Policlinico G. Martino

²Solarium Trapani

³Fisiosanisport S.r.l. Messina

Introduction. Lateral epicondylitis is a pathology generated by an overuse of the extensor tendons of the forearm. It is called "tennis elbow", although it can be related to various activities. We observed housewives with chronic lateral epicondylitis. Eccentric exercises are recommended for the treatment of lateral epicondylitis, but the clinical effect from eccentric exercise show late returns. Objective of this work is to see if the addition of Nd:YAG laser therapy to eccentric exercise turns into a rapid clinical improvement. **Materials and methods.** 42 housewives were observed in the period February-December 2009. Patients were randomized into groups receiving either eccentric exercise Nd:YAG laser therapy and eccentric exercise over a period of 8 weeks. **Results.** The best results over the first 4 weeks were obtained by patients receiving Nd:YAG laser therapy combined with eccentric exercise. **Conclusion.** Both therapies did reach the same outcome, over a period of 12 weeks of treatment.

References

1. Johnson GW, Cadwallader K, Scheffel SB, Epperly TD. Treatment of lateral epicondylitis. *Am Fam Physician*. 2007 Sep 15;76(6):843-8. Review.
2. Verhaar, B.J.: Tennis Elbow. Anatomical, epidemiological, and therapeutic aspects. *Int Orthop* 1994; 18: 263-7.
3. Van Rijn RM, Huisstede BM, Koes BW, Burdorf A. Associations between work-related factors and specific disorders at the elbow: a systematic literature review. *Rheumatology (Oxford)*. 2009 May;48(5):528-36. Epub 2009 Feb 17.
4. Parra, P.F., Pacini, F., Klein, S., Baioli, C., Arispici, M., Di Iorio, C.: Laser ad alta energia tipo ND-YAG defocalizzato: valutazione sperimentale del potere di penetrazione tissutale. *Laser & Tecnologia* 1993; 3 (1-2): 31-34
5. Escibano A., Berran, F.J., Delgado, C., Gallardo, A., Berral, C.J. and Lancho, J.L. Treatment of tennis elbow. *Med. du sport* 1996 ; 70(1): 9-16

The ESWL in the treatment of acute and chronic patellar tendinopathy in people that play sport regularly

A. Terranova¹, B. Pitrone², G. Vermiglio³, M. Vermiglio¹

¹Università Messina Policlinico G. Martino

²IOMI Messina

³Centro Medico Solarium S.r.l. Trapani

Introduction. Out of the different pathologies which cause instability of the knee the patellar tendinopathy is often present in those athletes which perform jumping activity. **Materials and methods.** Our study was done on 38 patients. All patients were evaluated with clinic as well as diagnostic exams such as XRay and ecography. The treatment was performed with the Storz Minilith SL1 machine. Patients affected by acute patellar tendinopathy were treated every 3 days as opposed to patients affected by chronic patellar tendinopathy who were treated every 7 days. **Results.** Results obtained by ESWL methods were satisfactory and led to a clinical recovery of athletes affected by patellar tendinopathy both chronic and acute. **Conclusion.** ESWT seems to be an effective conservative treatment for patellar tendinopathy.

References

- Costa ML, She L, Donei L.T.L. Thornas pstone, Shock Wave Therapy for Chronic Achilles Tendon Pain Clin. Ort. and Rel. Res. 440 2005
- Chung B. Wiley R Effectiveness of extracorporeal shock wave therapy. In the treatment of previously untreated lateral epicondylitis: a randomized controlled trial. Am. J.Sports Med. 2004,32
- Stasinopoulos D. Johnson M.Effectiveness of extracorporeal shock wave therapy For tennis elbow (lateral epicondylitis). Br. J. Sports Med. 2005,39
- Magra M, Maffiulli N. Molecular events in tendinopathy: a role for metallo-proteases Foot Ankle Clin. 2005, 10
- Ferretti A, Conteduca F, Camerucci E, Morelli F. Patellar tendinosis: a follow-up study of surgical treatment. J Bone Joint Surg Am 2002;84-A-12:2179-85.
- Taunton KM, Taunton JE, Khan KM. Treatment of patellar tendinopathy with extracorporeal shock wave therapy. BC Medical Journal 2003;45-10:500-7.
- Maganaris CN; Narici NV; Almekinders LC; Maffulli n. Biomechanics and pathophysiology of overuse tendon injuries:ideas of insertional tendinopathy Sports.Med.2004,34

Low Urinary Tract Dysfunction (LUTD) after stroke: incidence and evolution in patients recovered in intensive neurorehabilitation unit

G. Panariello¹, F. Sirico¹, R. Gimigliano¹, C. Setola¹, C. Passarielli¹, C.N. D'Onofrio¹, V. Scarano¹, M.D. Grasso¹., G. Del Popolo²

¹Neurorehabilitation Hospital "Santa Maria del Pozzo" Somma Vesuviana, Naples, Italy

²SOD Neurourology, Careggi University Hospital, Florence, Italy

Introduction. Aim of the study is to evaluate the incidence and evolution of the LUTD and their correlation with brain sides lesion in stroke patients. **Materials and methods.** Inclusion criteria: stroke, absence of LUTD before stroke, stable clinical conditions. Exclusion criteria: previous cerebrovascular diseases, severe neurocognitive impairment, global aphasia, previous uro-gynecological organic/functional diseases and pelvic surgery. 31out of 232 stroke patients were enrolled, 25 affected by ischemic stroke, 6 hemorrhagic stroke. 18 patients had right hemispheric lesions, 13 of the left. Patients were divided into 2 groups: 15 pathological patients (patients with LUTD) and 16 healthy patients. Indwelling Urethral Catheter (IUC) was early removed. After 15 days from removal of IUC and every 15 days until discharge, each patient was administered 2 questionnaires: one created by us and the ICI-q. **Results.** Healthy group did not present LUTD. 6 pathological patients presented voiding dysfunction, 6 urgency and 3 urge incontinence. After a mean time of 21,76 days (range 7-45) from the administration of the first questionnaires and after 80 days (range 33-169) from the stroke, the pathological group questionnaires did not show LUTD. Frontal lobe is involved in 10 patients of pathological group and in 1 patient among healthy. The parietal lobe was involved in 10 patients in healthy group and in 7 patients in pathological but, in these, there was always a simultaneous involvement of frontal lobe too. **Conclusion.** LUTD are transient in stroke patients. The frontal lobe seems to be responsible of the presence of LUTD, although there are patients with LUTD without its involvement. There are not LUTD when only parietal lobe is interested.

References

- Prevalence of lower urinary tract symptoms in stroke patients: a cross-sectional, clinical survey. Tibaek S, et al. NeuroUrol Urodyn. 2008;27(8):763-71.
- Lower urinary tract dysfunction and stroke. Ruffian A, et al. Urol. 2007 May;17(3):399-402.

The long and winding road of patients affected by acquired brain lesion to reach home

B. Lanzillo, C. Calabrese, V. Provitera, R. Nucciotti, C.V. Russo, M. Guariglia, A. Estraneo, V. Loreto,

Fondazione "S. Maugeri", Centro di Telesse Terme IRCCS

Introduction. Brain lesion are becoming more and more frequent and period of staying into the rehabilitation unit are increasing due to several clinical complication. We analyze all the modality of discharge and clinical complication observed during the period of rehabilitation. We verify the different outcomes in traumatic, vascular and anoxic patients **Materials and methods.** 167 patients (48 F and 120 M) were enrolled. 66 were affected by brain trauma, 79 by vascular (emorrhagic or ischemic), 18 by anoxic and 4 had complication for cerebral tumor. All underwent to different clinical scale (FIM, LCF, DRS, GOS-E). **Results.** 23 (13.7%) patients died ; according to GOS-E scale 33 (19.8%) patients were classified as VS; 56 pts (33.5%) 3 or 4; 27 pts 5 or 6 (16.6%); the remaining 30 pts (18%) 7 or 8. Between the died patients the majority were vascular and mean age was 66 years, (compared to 47 of the survived). The mean of duration of hospitalization was similar in TBI and Vascular patients and longer in anoxic. The most frequent complication was heterotopic ossification (25.7%), bedsores (29.17).Tracheal stenosis was present in 3 pts. 41 pts (24.4%) were momentarily discharged and the readmitted. **Conclusion.** Better outcomes for post traumatic patients; death of the patients is directly correlated with age; we observed long period of staying in rehabilitation unit for the difficulty of organize protected discharge and for the clinical complication. Heterotopic ossification and bedsores were the most frequent complication; . Much more effort must be done to treat and eventually prevent HO.

References

- Safaz I, Alaca R, Yasar E, Tok F, Yilmaz B. Medical complications, physical function and communication skills in patients with traumatic brain injury: a single centre 5-year experience. Brain Inj. 2008 Sep;22(10):733-9
 Rehabilitation following acquired brain injury: National clinical guidelines 2003
 British Society of Rehabilitation Medicine and Royal College of Physicians

Effects of a 10-week aerobic training in high level disability multiple sclerosis patients

S. Diaconescu, D. Cinteza, S. Popescu, G. Galbeaza, V. Marcu, A. Dima, D. Poenaru

National Institute Of Rehabilitation, Bucharest, Romania

Introduction. Overall, there is fairly strong and consistent evidence that individuals with MS are largely inactive compared with non-diseased populations. Current studies demonstrate that physical activity in patients with MS counteracts fatigue and may improve quality of life. No study explores physical activity in severely disabled MS patients. This study proposes to assess a supervised aerobic training program in a population of non ambulatory MS patients (EDSS 6,5 to 7,5). **Materials and methods.** The aerobic exercises program uses a therapeutic exercises: 10 weeks, 3 times a week. The protocol begins with 15 minutes of active work of the upper limbs, followed by 20 minutes of passive work of the lower limbs. The quality of life (SEP-59), level of activity (NAP), spasticity (Ashworth), functional capacity (Functional Independence Measurement) and fatigue (Fatigue Severity Scale) were assessed at baseline, 10 weeks, 3 and 6 months after the end of the program. **Results.** 50 MS patients are included.42 completed the study: 18 men, 25 women mean age 50.5 years, mean EDSS:6,74. Compared with baseline, the patients demonstrated significant (p<0.05) increases in energy score of QOL (SEP-59) and level of physical activity. Spasticity (Ashworth) and fatigue (FSS) decrease significantly (p<0.05). No significant effects were found in functional measurements (MIF) and EDSS. These positive effects persist during 3 months. No adverse events were observed. **Conclusion.** The practice of adapted and supervised physical activity remains possible for patients with severe disability. Fatigue does not increase, spasticity of the lower limbs decreases and quality of life and independence remains stable.

Cardiovascular disease at patients with SCI

G. Galbeaza, D. Cinteza, D. Poenaru, C. Teleianu, V. Marcu, S. Popescu, S. Diaconescu, A. Dima

Introduction. Because of the changes in the activity of the autonomic nervous system, decrease of daily energetic consumption, the

raised prevalence of risk factors for CHD cardiovascular diseases are frequent at these patients. **Objectives.** The main aim of this study is to determine the frequency and type of cardiovascular diseases at patients with SCI admitted in our clinic. **Materials and methods.** The study is a retrospective one and includes 19 patients with SCI admitted in our setting between January and August 2009. 17 of them were men. The age was 37 years on the average. Out of SCI ten were thoracic, one lumbar and eight cervical. Cervical SCI at first admittance for rehabilitation developed orthostatic hypotension at the beginning of the program but without needing of medical treatment. 9 patients had signs of CHD, 5 of them being with cervical lesion. In this group age was 42,5 on the average. Between the patients with modified ECG none had angina. The average time from the acute event was in the entire group 24 months. In the group with modified ECG was 25,3 months. 5 patients had dyslipidaemia, 2 of them having also modified ECG. 1 patient had deep venous thrombosis, 1 patient had obesity and 1 had autonomic dysreflexia. None had hypertension or diabetes. **Results.** Incidence of cardiovascular diseases rises with age and time from acute event.

Conclusions: The screening, recognition treatment and also the prophylaxis of cardiovascular disease should be an important component in the management of the patient with SCI.

References

- Myers J, Lee M, Kiratli J; Cardiovascular disease in spinal cord injury: an overview of prevalence, risk, evaluation, and management; *Am J Phys Med Rehabil*
 Svircev JN; Cardiovascular disease in persons with spinal cord dysfunction-an update on select topics; *Phys Med Rehabil Clin N Am*.

Rehabilitation of pediatric patient with spinal cord injury. Case report

F. Armakola, S. Sivetidou, K. Mihout, I. Gekas, J. Saramantos, T. Pyrgeli, E. Bakas

Department of Physical Medicine and Rehabilitation KAT Hospital Athens

Introduction. The general principles of paediatric and adolescent rehabilitation of spinal cord disorders differ significantly from adult rehabilitation, but the basic principles of recovery remain the same. Children and adolescents with spinal cord disorders and their families should be informed throughout the development and to be prepared for any complications or transitions that will occur as the kid grows up and passes to the adulthood and develops sexually. **Case report.** A 9-years old child after a fall of 3m on 11/08/09 was admitted to the local health centre and then immediately transferred to the paediatric orthopaedic department (where he received i.v. bolus 250mg solucortef) and was diagnosed complete paraplegia level TH10. From the imaging control (MRI and CT thoracic and lumbar spine was observed pathological intensity signal and wedge-shaped deformity of T12 vertebral body and anterior slippage of TH11 vertebra. At TH11-T12 level it was observed a curved spine. The spinal cord showed pathological signal intensity in height TH11-T12 that it was pressing medulla. Rupture or injury of the intraspinal TH11-TH12 was observed. In orthopaedic clinic received a three-day treatment with dexamethasone 64 mg / die, cefuroxime and analgesic therapy with tramadole 45mg and paracetamol. On 12/08/09 he was transferred to the department of orthopaedic spine clinic and underwent an open reduction spine surgery TH10-L2 and laminectomy TH11-T12. On 26/08/09 he was transferred to the clinic of Physical Medicine and Rehabilitation with a diagnosis of TH10 level paraplegia (ASIA A). On 06/10/09 he was informed about the use and the need on intermittent catheterization, and was given the instructions for the total of the liquids permitted per day (800-1000 ml fluid intake, and urinary output around 400 ml per catheterization). But until now the patient urinates in a reflex reaction, without residual urine volume. We inform also the patient for the need of the urodynamic control after six months of the injury. As the patient presenting urinary losses a urine sample and urine culture were collected and was found *Enterococcus faecalis* and susceptibility was treated with amikacin iv in consultation with the paediatricians. The patient was discharged in a wheelchair and with the prescription of the walk-about system. **Therapeutic interventions.** *Physical therapy:* recline bed, exercises of maintaining the range of motion, exercises of strengthening the upper limb, exercises of technical enforcement of the pathological reflexes, neuromuscular facilitation techniques, hydrotherapy (pool), and education of standing and walk with a walk-about. *Occupational therapy:* exercises of balance (sitting and standing position), exercises of transport, training of personal hygiene, and exercises of dressing. *Psychotherapy:* The clinical

Psychologist recommended treatment and follow up with a specialized psychologist *Social reintegration:* With the collaboration of the social workers the patient assisted the school lessons every week with a teacher appointed by the ministry of education. **Discussion.** This case report is presented because paediatric and adolescent rehabilitation of spinal cord disorders differ significantly from adult rehabilitation, but the basic principles of recovery remain the same. Children and adolescents with spinal cord disorders and their families should be informed throughout the development and to be prepared for any complications or transitions that will occur as the kid grows up and passes to the adulthood and develops sexually.

A protocol for the assessment of sensory re-weighting in the development of coordination during reach-to-grasp in children

M. Cazzagon¹, F. Zecchini¹, G.P. Tornatore¹, D. Restuccia¹, A. Merlo²
¹IRCCS "E.Medea" Polo Friuli, Associazione La Nostra Famiglia
²LAM, Laboratorio Analisi Movimento, SOC di Neuroriab., AUSL di Reggio Emilia, Osp di Correggio

Introduction. We designed a protocol suited to assess the relative contribution to the motor output of both the visual and the proprioceptive systems during a reach-to-grasp task and tested its feasibility and sensitivity on a sample of healthy children with age 10-12. **Materials and methods.** Ten healthy children (age 11±0.8) were asked to repetitively reach and grasp an object placed on a table in front of them, for 20 seconds, at natural self-paced speed. All environmental factors were standardized as in [1]. Each task was performed in four conditions: lighted room (L), dark room with only the object visible (D), lighted room with a weight (500 grams) on the forearm (LW), and dark room with the weight on the forearm (DW). Tasks were administered in random order, for three times, after a trial session. Kinematic data were obtained from reflective markers by means of a 3D motion analysis system (SmartD, BTS, Italy), as in [1]. The effect of the environmental condition on the index of curvature of the finger trajectory (IC), the number of peaks in the index trajectory (NP) and the arm-trunk displacement delay (ATDD) was investigated by the non-parametric Wilcoxon test, with significance set at 5%. **Results.** The protocol was completed by all children. The environmental condition did not affect IC. The trajectory was straight in all conditions (IC = 1.1), due to the distance of the target. NP increased significantly from 1 to 2 or 3 in the DW condition, as expected. ATDD was sensitive to the lack of visual information created by the dark environment. **Conclusion.** Results suggest that the designed protocol, with minor improvements, can be used to follow the development of the visual and the proprioceptive systems and their relative contributions to motor control in reaching tasks during childhood.

References

1. Schneiberg et al, *Exp Brain Res* (2002) 146:142-154.

Comparison of functional outcome in Traumatic vs non-traumatic spinal cord lesions

L. Salvi, R. Avesani

Spinal Unit, Rehabilitation Department, Sacro Cuore – Don Calabria Hospital, Negrar (VR)

Introduction. We made a retrospective comparative study of 2 years duration on a population of acute spinal cord-injured patients with the aim to compare functional outcome of persons with traumatic vs non-traumatic spinal cord lesion (SCL). **Materials and methods.** Seventy patients with acute SCL admitted for in-patient neurorehabilitation in the last 2 years: traumatic (34 patients, M/F=32:2; age 45,75±16,62) and non-traumatic (36 patients, M/F=21:15; age 55,97±18,99). ASIA impairment scale, duration of stay (DOS) and admission and discharge-FIM scores in both groups were recorded, compared and analyzed. **Results.** ASIA impairment scale scores were not significantly different in the two groups (P>0.05). DOS for rehabilitation was higher for traumatic group as compared to non-traumatic group (87,44±54,31 days vs 67,11±49,15), although statistically not significant (P=0,1). FIM scores were 60,67 ± 17,82 vs 70±23,39 at admission and 102,85±23,35 vs 98,72±26,33 at discharge in traumatic and non-traumatic group, respectively. All patients (n=70) showed significant improvement in FIM score (P=0,000) but, in spite of the initial difference of 10 points less in traumatic group, no statistically significant difference (P>0.05) was recorded between two groups at discharge (P>0,05). **Conclusion.** Starting with initial similar ASIA

impairment scores, the study showed no statistically significant difference in the length of stay and the functional outcome between persons with traumatic and non-traumatic SCL.

References

- Gupta A, Taly B et al. Traumatic vs non-traumatic spinal cord lesions : comparison of neurological and functional outcome after in-patient rehabilitation. *Spinal Cord* 2008; 46, 482-487.
- McKinley WO, Seel RT, Gadi RK, Tewksbury MA. Non traumatic vs traumatic spinal cord lesions: a rehabilitation outcome comparison. *Am J Phys Med Rehabil* 2001; 80:693-699.

Psychological resources of patients with motor impairment to realize their rehabilitation potential during early rehabilitation

A. Angelova, E. Ilieva

Medical University Hospital, Plovdiv, Bulgaria

The study is inspired by the conception of individual style and characteristics, which results in optimal psychobehavioral activity based on the specific type of psychodynamic individuality. The proposition is that the temperaments are principally equal and do not predict the achievements of the person. The aim is to study the effect of the individual temperament and anxiety level on the outcome of rehabilitation in patients with motor impairments. Three groups of patients: 19 stroke patients; 12 - after an attack of multiple sclerosis; 9 - after fracture of the lower limbs. The patients received standart rehabilitation programmes with special attention to the psychoemotional status, stimulating their motivation. Methods of assessment: temperament-behavioral questionnaire; anxiety scale; interview; standart methods for evaluation of the outcome of rehabilitation concerning functional recovery. A low level of anxiety was registered in all the patients without any significant differences between them. The temperament-behavioral questionnaire revealed prevalence of flegmatic, choleric and sanguine temperaments in stroke and MS patients; melancholic, sanguine and depressive - in patients with fractures. There were not any statistically significant differences in the stage of functional recovery as a result of the rehabilitation between the patients with different temperament components. This pilot study proved the proposition that there is not an inferior temperament, but it is important to apply a holistic approach considering the biopsychological characteristics of the patients. The empathic attitude and the qualified health care is a prerequisite for a low anxiety level in the patients.

References

- _____ , _____ , 1980, _1, 58-71
- Compton MT, Nemeroff CB. Depression and bipolar disorder. In DC Dale, DD Freedmaneds, ACP Medicine, New York, 2008
- Nutt D, Argyropoulos S. Generalized anxiety disorder: a comorbid disease. *European Neuropsychopharmacology*, 2006, 16, 109-118

Short term effects of ultrasound therapy in knee osteoarthritis

R. Ungur, I. Onac, T. Mocan, L. Irsay, I.M. Borda, S. Suciuc

"I.Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania

Introduction. Therapeutic ultrasound may be beneficial in knee osteoarthritis (OA)¹, in terms of safety and efficacy in pain relief and function improvement². The aim of this study was to evaluate the efficacy of therapeutic ultrasound in knee OA, 14 day after the end of treatment. **Materials and methods.** 12 patients, diagnosed with knee OA according to American College of Rheumatology, stage 1 or 2 on frontal knee radiography, were treated with ultrasound therapy 850±5% KHz, 0,5W/cm², continuously, on OA knee for 5 minutes, 10 sessions. WOMAC score (WS) and Lequesne index (LI) were evaluated prior to, in the end of and 14 day after therapy. SPSS software version 17 was used for statistical analysis. **Results.** In the end of therapy a statistical significant decrease of the WS (p=0,03) and LI (p=0,03) was observed. This improvement persisted 14 days after the end of treatment (p=0,03) for both parameters. **Conclusion.** Ultrasound therapy is safe and efficient for knee OA treatment.

References

- Rutjes AW, Nuesch E, Sterchi R, Jüni P. Therapeutic ultrasound for osteoarthritis of the knee or hip. *Cochrane Database Syst Rev*. 2010 Jan 20;(1): CD003132.
- Ozgonenel L, Aytekin E, Durmuoglu GA double-blind trial of clinical effects of therapeutic ultrasound in knee osteoarthritis. *Ultrasound Med Biol*. 2009 Jan;35(1):44-9. Epub 2008 Oct 2

Effect of PTH 1-84 on the increase in BMD and pain reduction in a retrospective study of patients with osteoporotic vertebral fractures

M.C. García-Ameijeiras¹, A. Gómez-Garrido¹, M. Tovar-Felice¹, A.M. Leon-Espitia¹, S. Caño²

¹Servicio de Rehabilitación. Hospital Universitario Vall d'Hebron, Barcelona, Spain

²Medical Department Nycomed, Madrid, Spain

Introduction. Women with postmenopausal osteoporosis (OP) and a high fracture risk may benefit from PTH treatment increasing their bone mineral density (BMD), reducing new vertebral fractures (VFs), and improving vertebral pain. The present study analyzes the increase in spinal and femoral BMD, and the evolution of vertebral pain with treatment. **Material and methods.** A retrospective study was made of 41 women with OP VFs attended in the Rehabilitation Service and who have been treated with PTH 1-84. All the cases were diagnosed by X-rays or CAT. Bone mineral density evaluations of the spine and femur were available in 41 patents at baseline and in 37 patients after treatment. An evaluation was made of the changes in BMD and of the course of pain assessed by the visual analog scale (VAS). 95% confidence intervals (CIs) were determined. **Results.** The mean patient age was 72.1 years (range 54-86). Eighteen patients had thoracic fractures and 29 lumbar fractures. Ten patients had two VFs and 8 patients had 3 VFs. The median duration of PTH treatment was 18 months. The median reduction in VAS pain score at the end of treatment was 2 points (n=38). Bone mineral densitometry showed a mean percentage variation of +5.30% (CI 3.64-6.97) in the spine and -1.04% (CI -2.41-0.31) in the femur with respect to the baseline values (p<0.001 and p=0.07), in patients under treatment for ≥ 12 months (n=37). In the case of the women treated for ≥ 16 months (n=30) and ≥ 18 months (n=24), the increases in spinal BMD were significant (p<0.001). No new fractures were recorded among the patients during treatment. **Conclusion.** Treatment with PTH 1-84 shows significant evidence of an increase in spinal BMD in our series. Improvement in pain, as assessed by the VAS, was also observed. No new fractures were recorded among the 41 patients during the PTH 1-84 treatment period.

Combination of low level laser therapy and needle acupuncture in treatment of subacute low back pain in geriatric patients

L.M. Konstantinovic, S.J. Jović, A.S. Dragin

Clinic for rehabilitation dr Miroslav Zotovic, Medical School, University of Belgrade, Serbia.

Introduction. Low back pain (LBP) is one of the most frequently medical problems in geriatric population. Aim of this study was to investigate clinical effects of combination of low level laser therapy and needle acupuncture in treatment of subacute lumbar pain in geriatric patients, proposed as adjunct therapy. **Materials and methods.** The prospective study concluded 78 patients aged 65 and older suffering from subacute low back pain caused by degenerative disease of spine. A randomized single-blind controlled trial was performed on 78 patients. Group A (26 patients) was treated with Low Level Laser Therapy (LLT); Group B (26 patients) was treated with acupuncture; Group C (26 patients) was treated with combination of LLT and acupuncture. LLT was applied behind the involved spine segment using stationary skin contact method. Patients were treated for a total of 10 treatments with the following parameters: wavelength 904 nm, frequency 5000 Hz, 100 mW average diode power, power density of 20 mW/cm², and dose of 3J/cm², treatment time 150 s, at whole doses of 12 J/cm². Acupuncture points were selected according to traditional theory. All patients were treated with NSAL drugs and instructed for allowed activities. The outcomes were pain intensity measured with visual analogue scale (VAS), lumbar movement with modified Schober test, pain disability with Oswestry disability score and quality of life with a 12-item short-form health survey questionnaire (SF-12). Subjects were evaluated before and after the treatment. Statistical analyses were done with SPSS.11. **Results.** Statistically significant differences were found in all outcomes measured (p<0.001), but better in group C than B (p<0.0005, with high effects size d -0,89) and A (p<0.0005, with moderate effects size d-0,56). **Conclusion.** Results of this study show better improvement in geriatric patients with subacute LBP treated with combination of LLT and acupuncture proposed as adjunct therapy.

References

- Hartvigsen J, Christensen K, Frederiksen H. Back pain remains a common symptom in old age A population-based study of 4486 Danish twins aged 70–102. *Eur Spine J* 2003;12:528–34.
- Weiner DK, Haggerty CL, Kritchevsky SB, et al. How does low back pain impact physical function in independent, well-functioning older adults? Evidence from the health ABC cohort and implications for the future. *Pain Med* 2003;4:311–20.
- Rudy TE, Lieber SJ. Functional assessment of older adults with chronic pain. In: Gibson S, Weiner D, editors. *Pain in older adults: Progress in pain research and management* 2005; vol. 35. Seattle (WA): IASP Press; 2005. p. 52–73.
- Ernst E, White AR. Acupuncture for back pain: a meta-analysis of randomized controlled trials. *Arch Intern Med* 1998;158:2235–2241.
- Bjordal JM, Jonhson MI, Iversen V, Aimbir, F, and Lopes-Martins RA. (2006). Low-level laser therapy in acute pain: a systematic review of possible mechanisms of action and clinical effects in randomized placebo-controlled trials. *Photomed. Laser Surg.* 2006; 24:158-168.

A case of paralysis caused by a disorder of the spinal cord in acute meningococcal meningitis

D. Uliano, R. Mazzocco, T. Scellini

Department of Rehabilitation Medicine, ASREM, Campobasso

Introduction. The spinal injury is a rare complication of the bacterial meningitis. The case we have examined concerns the dorsal part of the cord with injury at the D6 level. **Materials and methods.** Aim of the work is to show how important is to start a rehabilitative treatment since the acute phase of the disease. We have used assessment scales (ASIA Impairment Scale, FIM scale, The Rivermead Mobility Index) during the rehabilitative course. We have evaluated the spinal cord injury by encephalon and cord RM examination, EMG examination and urodynamic examination. The re-education of the control of the sphincters has occurred through the intermittent catheterism and the biofeedback, many techniques of neuromotor rehabilitation ; we have used a pharmacologic therapy, to increase the detrusorial compliance and to reduce its highest pressure. **Results.** The patient has reached a good level of autonomy, with a good control of the trunk in seated or erected position, a good recruitment of the proximal and distal musculature of the right lower limb and with a partial recruitment of the partial musculature of the right lower limb and with a partial recruitment of the partial musculature of the opposite lower limb. The patient succeeded to carry out independently the movements and to walk with two canadian sticks for short distances. **Conclusion.** It is important to start the rehabilitative treatment since the acute phase of the illness and to establish since the beginning the functional goals, based on the extension of the cord injury, the muscular strenght of the musculature situated below the injury, and on the period of resumption of the cord function.

References

- Kastenbauer S, Winkler F, Fesl G, Schiel X, Ostermann H, Yousry Ta, Pfister HW. Acute severe eponal cord dysfunction in bacterial meningitis in adults: M.R.I. findings suggest extensive myelitis. *Arch. Neurol.* 2001;58(5): 717-8

A contribution for the data about Surf injuries in Portugal

J. Almeida; J. Laíns

CMRRC, Rovisco Pais

Introduction. Surf practice has been growing exponentially in Portugal. However, there are no published studies about this issue. The few existent papers (international) show that the most common injuries are lacerations and contusions to the head, neck and lower extremity. Most of them result from direct collision with their own board. **Objectives.** The purpose of the study was to know the Portuguese reality about surfing-related injuries, understand their pattern and risk factors and define injury prevention strategies. **Materials and methods.** Cross-sectional study that included 151 surfers (convenience sample), both genders, aged 18 years or more, and that have been active surfers during 2009. The questionnaire was developed by the author. It was used SPSS program 16.0. **Results.** There were a total of 306 injuries, 246 were acute: lacerations (46.4%), contusions (10.1%), sprains/strains (8.2%) and fractures (8.2%). They were to the head (31.3%) and lower limb (31.3%). 53.3% resulted from the collision with their own board, 20.2% occurred during entering/exiting water, 65.9% in sand bottom, with small

waves (42.7%) and with shortboards (81%). 60 chronic injuries were described; 5.9% tendinopathies (shoulder – 83.33%) and 5.2% lower back pain. Surfers that practice in large waves have a higher risk for significant injuries. The calculated risk injury was 2.4/1000 episodes. **Conclusion.** It is quite possible that most of the injuries can be prevented by the use of protective equipment, changes in the equipment and self-protection strategies. It is important that these data are published and known to promote a culture (and even a “fashion”) of prevention. More studies, with larger samples, are needed for a better evaluation of surfing injuries.

Evaluating inpatient rehabilitation for subjects with traumatic brain injury: use of early variables to predict functional outcomes and direct clinical practice

R. Avesani¹, M. Fedeli¹, C. Ferraro², M. Khansefid¹

¹*Rehabilitation Department Sacro Cuore-Don Calabria, Negrar, Italy.*

²*Rehabilitation Department, University of Padova, Padova, Italy.*

Introduction. The growing complexity of services for subjects with traumatic brain injury (TBI) requires an early delineation of therapeutic and nursing needs. Both knowledge of patients’ characteristics and recovery patterns and identification of prognostic factors are of great value to plan rehabilitation and assistential programmes. Aims of our study are to delineate function related groups on the basis of one or more indicators and to identify predictive factors for outcome. **Materials and methods.** *Research design:* retrospective database analysis. *Setting:* an Intensive Rehabilitation Unit for severe acquired brain injury. *Subjects:* 225 patients with TBI admitted between 2004 and 2008. All subjects came from acute care wards and were at their first rehabilitative admission. *Main outcome measures:* admission and discharge Functional Independence Measure (FIM), Disability Rating Scale (DRS) and its subdivision into 9 categories, Levels of Cognitive Functioning (LCF) and Glasgow Outcome Scale (GOS). Data collected also included demographic characteristics, Glasgow Coma Scale (GCS) and length of acute and rehabilitative stay. Logistic regression and ordered logistic regression models were run to investigate determinants of change in DRS category and of final DRS score, respectively. **Results.** When patients were subdivided on the basis of admission DRS categories a linear correlation among variables could be observed: the most disabled patients showed the longest acute and rehabilitation stays and the worst outcomes. Functional gains improved with younger age ($p=0,007$), shorter acute and rehabilitative stay ($p=0,009$ and $p=0,012$) and decreasing initial DRS score ($p=0,000$). Final outcome was influenced by age ($p=0,000$), time from injury to admission ($p<0,000$), length of rehabilitation stay ($p=0,005$) and initial functional status ($p<0,000$). **Conclusion.** Systematic data collection in intensive rehabilitation is of great importance to monitor recovery and plan appropriate programmes on the basis of admission functional status.

Painful Accessory Soleus Muscle in the Athletes: 3 first Cases treated by Botulinum Toxin A.

J. Lecocq, M.E. Isner-Horobeti

Service de Médecine Physique et de Réadaptation, Hôpitaux universitaires de Strasbourg, France et Société Française de Médecine du Sport, Paris, France

Introduction. The supernumerary muscles, in particular the accessory soleus (AS), can become painful without clearly known etiology. Currently the only treatment is the muscle excision. The aim is to test the hypothesis that botulinum toxin A (BTA) is an effective treatment to avoid surgery. **Materials and methods.** It’s a preliminary trial in 3 cases, (a female and 2 males). Pain was present on exertion at the level of a small mass in the postero-medial aspect of the ankle. The diagnosis was confirmed by MRI. Additional examinations looked into the cause of the pain. The BTA injection (70 units of Botox® for the woman, 500 units of Dysport® for the men) in 2 sites of the AS was guided by palpation and electrostimulation. **Results.** The intramuscular pressures were normal, excluding an exertional compartment syndrome. Doppler was normal. The EMG found an entrapment syndrome of the tibial nerve at the level of the AS mass only in one patient. The exertional pain disappeared in the 3 patients: the first patient examined systematically in 2 months and 1 year had no pain; the second patient was relieved during 10 months but the pain recurred. A new BTA injection was performed with again a good result with a follow-up of 7 months. The last

patient is painless but the follow-up is only 4 months. **Conclusion.** Our 3 cases of painful AS muscle are, to our knowledge, the first to be treated by BTA injection. This preliminary trial is not finished but the first results are interesting and must be confirmed on a higher number of patients and in a long-term. The hypothesis of the effectiveness is that BTA decreases the volume and/or the tonus of the AS and removes a nerve entrapment. This treatment of supernumerary muscle could be an alternative to muscle excision when the pain is serious.

Neuro-rehabilitation in Algarve. The CMR Sul experience (Poster). Evidence – Efficacy – Effectiveness of a Comprehensive Rehabilitation Program

M. Sizenando¹, C. Castelo-Grande², L. Malaia², R. Diaz², J. Pimenta³

¹Physical Medicine and Rehabilitation Specialist and Medical Director

²Physical Medicine and Rehabilitation Specialist

³Executive Director

Centro de Medicina de Reabilitação do Sul – Algarve - Portugal

Introduction. CMRSul was created in 2007 (CARF Accreditation - October 2008) as a top level Rehabilitation Hospital focused in neuro-rehabilitation, providing a comprehensive, interdisciplinary inpatient rehabilitation program to Algarve and South Alentejo population (500.000); the rehabilitation program is designed as an intensive 6 h/day 6 days/ week training. The Rehabilitation Comprehensive Program is described. **Materials and methods.** 792 patients were studied from April 2007 to December 2009, divided in four groups: SCI, TBI, Stroke, "Other Neurological Condition". The length of stay (LOS), FIM and FAM scores and Functional Modifiers at admission and discharge are described and parameters of efficacy and effectiveness analysed. In addition we analyse the functional outcomes with two different types of internal functional organization: 1. Therapist "rotation": the therapists "rotate" every other week; 2. Conventional "fixed" therapist: the same therapist for the entire LOS. **Results.** Efficacy - Effectiveness: functional goals achieved in 2007, 2008 and 2009: % >=95%; FIM improvement decreased after switching to a conventional fixed therapist system in 2009 (in all groups) global: 32 (2007); 19,1 (2008); 15,4 (2009) Global LOS was not significantly different: 42, 2 (2007); 48 (2008) and 45, 9 (2009) FIM improvement/LOS decreased in all groups: 0, 76 (2007); 0, 40 (2008); 0, 34 (2009). No significant difference found in the characteristics of patients: age, gender, admission FIM scores, co morbidities. No other changes were made in the rehabilitation program. (Detailed table is presented). **Conclusion.** The only different factor was the type of organization: rotational versus "fix" therapist. We found that the therapists rotation, while maintaining a single responsible therapist to ensure continuum of care and several checkpoint briefings and team meetings, may contribute for a more effective rehabilitation program with better outcomes and lower length of stay; however further studies are needed. We challenge other Rehabilitation Centres to try this different approach and compare the results.

Implementing Business Intelligence in Rehabilitation assessment and performance improvement - A case study

M. Sizenando¹, J. Pimenta²

¹Physical Medicine and Rehabilitation Specialist and Medical Director

²Executive Director

Centro de Medicina de Reabilitação do Sul – Algarve - Portugal

Introduction. CMRSul is a rehabilitation hospital with 54 beds managed as a Public Private Partnership. The Management Contract stipulates the need for a global Hospital Information System that covers all areas of management and describes over 342 performance indicators that need to be calculated "online" every month. This presentation will focus on the drivers described but mostly the capabilities that we have developed that allow for an online access to all the information needed for performance measure and performance improvement (clinical and non-clinical). **Materials and methods.** This is an oral presentation. Using internet access we will directly access the Hospital system to go through an example of information entering process (to show how we have structured the data) and then we will access the Business Intelligence system to show the richness of information that can be obtained by these kinds of

projects. **Results.** The result achieved is the complete coverage of all reporting needs and, through systematic analysis of the data, the continuous quality improvement that derives from setting goals and monitoring activity. This presentation will be practical, showing our live system and live examples with real patient data. It will not focus on the technology providers or the applications and is intended on providing good, practical advice to those thinking about implementing business intelligence software in rehab. **Conclusion.** We propose a hands-on presentation that will describe our approach on the implementation of Healthcare information systems in our Rehab hospital and demonstrate the benefits that we get from it, specifically on the business intelligence software. The main point will be to recommend adequate planning of the implementation of the supporting information system in terms of the information that you expect to get in the end.

Do shared genetic factors account for the association between neck pain and other self-reported physical and psychological symptoms? A twin study among 11-year-olds

M. Ståhl¹, M. Mikkelsen², A. El-Metwally³, J.J. Salminen¹, L. Pulkkinen⁴, R.J. Rose⁵, J. Kaprio⁶

¹Department of Physical and Rehabilitation Medicine, University Hospital of Turku, P.O.Box 52, 20520 Turku, Finland

²Rehabilitation Centre, Päijät-Häme Central Hospital, Päijät-Häme Social and Health Care Group, Keskuksairaank.7, 15850 Finland

³Department of Public Health, University of Aberdeen, Aberdeen, AB25 2ZD, U.K.

⁴Department of Psychology, University of Jyväskylä, P.O. Box 35, 40014 Jyväskylä, Finland

⁵Department of Psychological and Brain Sciences, Indiana University, Bloomington, Indiana, USA

⁶Department of Public Health, University of Helsinki, 00014 Helsinki, Finland and Department of Mental Health and Alcohol Research, National Public Health Institute

Introduction. The aim of this study was to investigate the strength of the association between neck pain (NP) and other physical and psychological symptoms, and the role of genetic and environmental factors to this association. **Materials and methods.** A nation-wide sample of 11-year-old Finnish twins: 295 female and 309 male monozygotic (MZ) pairs, 268 female and 320 male dizygotic (DZ) pairs and 576 opposite sex DZ pairs. Frequency of NP and nine other symptoms (headache, stomach ache, depressiveness, irritation and aggressiveness, dizziness, tension and nervousness, walking up during nights, day tiredness and difficulties falling asleep) during the preceding three months were asked in a mailed questionnaire. Sex-specific bivariate structural equation modeling was used to explore genetic and environmental correlations of NP and sum score (0-9) of other symptoms in a frequency of at least once a week. **Results.** Significant associations between NP all nine symptoms were found. Risk for more frequent NP increased 1.5 times per additional weekly symptom. Pairwise polychoric correlations in liability to NP were 0.67 in MZ and 0.38 in DZ pairs. Corresponding correlations in liability to symptom score were 0.54 and 0.33. Cross-twin cross-trait correlations were greater in MZ than in DZ pairs. Biometric fitting suggested that of the covariance between NP and symptom score, 15% in girls (32% in boys) could be attributed to genetic factors, 66% (38%) to shared environmental factors and 19% (30%) to unique environmental factors. **Conclusion.** Although genetic factors seem to play an important role in liability to neck pain and also to the symptom score, the association between the two is to only a minor extent mediated by common genetic factors.

Correlative relation between arterial hypertension and parameters of recovery of the hemiplegics

S.D. Draganac

Institute of Rehabilitation "Selters", Belgrade, Serbia

Introduction. Ischemic brain illness with its occurrence, mortality rate and invalidity of the survived represent a significant medical, social and economical problem of the modern society. Arterial hypertension is the most common risk factor and it influences the functional recovery of the patients with hemiplegia. **Materials and methods.** To establish the correlative relation between prognostic

sis and recovery parameters of the hemiplegics with arterial hypertension. Methodology: retrospective study was done at the Institute for Rehabilitation at "Selters", Mladenovac. 100 patients with hemiplegia were included. They were treated with magnetotherapy, kinesis treatment and work therapy. The prognosis scale of spontaneous recovery was done before PT. The parameters of functional recovery which were used are: Brunstroms classification, FIM scale, MMSE and DMAS scale which were established at the admission and after 30,60,90 days and 6 months. **Results.** Arterial hypertension was diagnosed at 89 patients with hemiplegia. The prognosis scale of spontaneous recovery was worse with hypertensive patients 21.627, the normotensive had 21.455. FIM score and MMSE score was significantly lower at the hypertensive patients (FIM score 38.133, 47.618, 56.499, 64.011; MMSE score 21.506, 23.449, 24.708, 25.023) **Conclusion.** Patients with hypertension have prognostic low grade recovery. It is proved by FIM and MMSE score at the admission and after the rehabilitation

References

1. Parfenov VA, Gurak SV. Secondary stroke and its prevention in patients with arterial hypertension; *Jurnal neurologii i psihiatrii imeni S.S. Korsakova*; 2005, no14, pp. 3-7
2. Droste DW, Rifler MA, Dittrich R, Heidenreich S, Wichter T, Freund M, Ringelstein EB. Arterial hypertension and ischaemic stroke; *Acta neurologica scandinavica*; 2003, vol. 107, no4, pp. 241-251
3. Opeolu Adeoye, Edward C. Jauch; Management of Arterial Hypertension in Patients with Acute Stroke; *Current Treatment Options in Neurology* 2006, 8:477-485
4. Fisher M, Miselman JH. Hemorheological factors in cerebral ischemia, *Stroke*, 1991.; 1164-1169
5. Poole LJ. Rehabilitation Occupational Therapy for Stroke, *Cerebrovascular Diseses*, Academic Press, San Diego, 1997.; 744-746

Rehabilitation Program in female child with Klippel-Trenaunay syndrome: a case study

G. Della Bella^{1,2}, O. Lai¹, S. Fabriani¹, C. Foti², E. Castelli¹

¹Rehabilitation Unit, Neuroscience and Neurorehabilitation Department Children's Hospital Bambino Gesù, Passoscuro, Rome ²Pb.D In "Advanced Technology In Rehabilitation Medicine" Tor Vergata University, Rome, Italy

Introduction. Klippel-Trenaunay syndrome (KTS) is a rare congenital vascular disease of bone characterized by malformations by the following triad of clinical signs of the vessels of a limb, particularly of arterio-venous type, which causes overgrowth of the limb; pain may also be a feature of KTS. The etiologies of KTS is unknown. A defect in an angiogenic factor, VG5Q, has been proposed. Males and females are equally affected, and no racial or geographic predominance is noted. The majority of patients with KTS are managed conservatively. Epiphysiodesis is recommended in cases where leg length discrepancy of more than 2 cm is present in a growing child. The intraosseous AVM should be treated by direct puncture and the occlusion, or, with the embolization catheter, but this surgery should be avoided because the risk of bleeding is high. Materials and methods. This case study describes the clinical history of a female child 7 years old from Ecuador suffering from this rare syndrome and admitted to our Rehabilitation Unit, in October 2009 for motor rehabilitation. During The last 2 years, she was treated with the embolization for the intraosseous AVM; in June 2009 she was undergone surgery to the left Achilles tendon lengthening without following an Rehabilitation program. In October 2009 the female child began the rehabilitation program: three times weekly; she was able to walk only with two elbow crutches and the left leg was hypertrophic, flexed for severe pain and also leg length discrepancy. The aim was to reduce pain and lymphedema, to improve the gait performance then prevent or postpone another surgery. Programs: orthoses; Lymphedema treatment, stretching, proprioceptive exercise and gait training. Outcome measures: FLACC, LEFS, video gait at the first session, at two and at four months. **Results.** At December 2009 the child was able to walk for short distances; the pain was reduced. The child is continuing rehabilitative training. **Conclusion.** Patients with KTS are best served by a multidisciplinary approach, and this case study shows the effectiveness of Rehabilitation.

References

Meier S. Klippel-Trenaunay syndrome: a case study. *Adv Neonatal Care*. 2009 Jun;9(3):120-4. Review. PubMed PMID: 19542774
 Rasheed R, Durr-e-Sabih, Rahim MK, Uddin N. Klippel-Trenaunay syndrome. *J CollPhysicians Surg Pak*. 2009 Nov;19(11):729-31. PubMed PMID: 19889273.

Recovery of upper limb in patients with recent ischemic stroke after application of repetitive magnetic transcranial stimulation

A.M. Bumbea, R. Traistaru, R. Popescu, D. Matei, A. Dinu
 University of Medicine and Pharmacy, Department of Rehabilitation, Neuropsychiatry Hospital, Craiova, Romania

Introduction. Repetitive Transcranial magnetic stimulation (rTMS) is a new method applicable in patient rehabilitation after stroke, there are numerous publications in this area. We propose to evaluate the prehension recovery, decrease of spasticity in patients with ischemic stroke 6 weeks recent. **Materials and methods.** We took into study 24 patients that were divided into two equal groups. The criteria for inclusion in the study: ischemic stroke of maximum 6 weeks, patient with hemodynamical and cardiovascular balance, stable neurologically and cooperating, the group A included 12 patients who were applied rTMS at the ischemic focus level for 5 minutes, for 10 consecutive days. In group B of 12 patients was applied electrotherapy with rectangular currents to paretic forearm extensors for 20 minutes, for 10 consecutive days, the patients being taught to actively participate in achieving movement. Were used for evaluation the spasticity Ashworth modified Scale, Baciu Scale for prehension assessment, evidence of paresis. Both groups received appropriate medicamentary treatment and individual kinetic program. **Results.** Group A obtained better values of prehension, with reduced spasticity to allowed kinetic limits. In group A spasticity was reduced from 3.8 to 2.8, while in group B was reduced by 0.5. The prehension improved in group A by 40% compared with group B in which improvement was of 25%. **Conclusion.** The application of rTMS in patients with recent stroke is an easy method to apply with results far superior to traditional methods of stimulation, through which are eliminated the risks of fake movement.

Peripheral repetitive magnetic stimulation (prms) in patients with traumatic paraplegia

A.M. Bumbea, R. Traistaru, A. Bighea, D. Matei, A. Dinu
 University of Medicine and Pharmacy, Department of Rehabilitation, Neuropsychiatry Hospital, Craiova, Romania

Introduction. PrMS is used in the peripheral neurological sufferings by local application at troncular level. We intend to emphasize the role of RPMS applied to the affected root and highlight the improvement of neuromotor performances in patients with paraplegia. **Materials and methods.** Were taken into study 7 patients (study group) with post-traumatic paraplegia in a period of 6 months from trauma, three patients required stabilization metal osteosynthesis of thoracic spine T6-T7. We used to patients the application of repetitive magnetic stimulation for 5 minutes for 10 consecutive days at lumbar level, bilateral right and left. Patients were examined for 3 months, at the initiation of treatment, at the end and at 3 months. Monitoring consisted in testing muscle (scale of 0 to 5), evaluating sensitivity, functional status-quality of life using the FIM (Functional Independence Measure) scale. To correctly evaluate we compared the data obtained with a control group of 5 patients with paraparesis to whom we applied electrotherapy with exponential currents on denervated muscles. Both groups received appropriate medicamentary and kinetic treatment. **Results.** We obtained an increase of muscle force from 2.3 to 3.5, in patients who underwent magnetic stimulation compared with control group where the increase was of 0.5. Superficial and deep sensitivity presented a significant improvement only in the group that followed the PrMS. Functional status improved in both groups, and statistically significant in study group. These results were maintained at 3 months of assessment at the beginning of the stimulation program, to both groups, maintaining the difference in favor of the group of study. **Conclusion.** We can conclude that methode is an effective one to rehabilitate the patient with paraplegia, having provided good results during the first time and maintained at three months after the application program.

Efficiency of topically applied therapy in reducing disease symptoms and signs in patients with CVI

J. Nikolić-Pucar, S. Markez, D. Gajić, V. Keković, D. Živanić
 Institute for physical medicine and rehabilitation "Dr Miroslav Zotović"

Introduction. Chronic venous insufficiency (CVI) is a set of pathological conditions that, through elevated venous pressure, leads

to progressive stasis and sequent inflammatory changes of the skin and subcutaneous tissue. Terminal condition of CVI is a phenomenon of venous ulcers. The present CVI classification is based on following: clinical signs (C), etiology (E), anatomic (A) distribution and pathologic (P) dysfunction (Porter and others 1995)- **CEAP** classification. **Materials and methods.** Prospective research included 42 outpatients (8 men, 34 women) with CVI who were followed for three weeks. Among these 42 patients, there were 2 patients who haven't finished the therapy protocol. All patients applied heparin gel and 25 patients were treated with elastic-compressive stockings as well. **Results.** The effects of applied therapy is reflected in the reduction of the symptom severity (heaviness in the limb, pain, cramps, fatigue), as well as objective signs. **Conclusion.** After applied therapy, objective decrease of oedema and improvement of skin and subcutaneous tissue nourishment were obvious: 15 % of patients moved from grade C3 to grade C2, classified by CEAP classification.

References

- Hendro S. Yuwono, Diagnosis and treatment in the management of chronic venous insufficiency, *Clinical Hemorheology and Microcirculation* 23 (2000) 233-237: IOS Press
- Cesare Vecchio and Anna Frisinghelli, Topically Applied Heparins for the Treatment of Vascular Disorders: A Comprehensive Review: REVIEW ARTICLE *Clin Drug Invest* 2008; 28 (10): 603-614
- Rosaria Cesarone M; Belcaro G; Errichi S and others. Microcirculatory effects of Viatromb spray gel heparin in chronic venous insufficiency: evaluation of TePO2 and PCO2-a product evaluation study, *Angiology [Angiology]* 2007 Apr-May; Vol.58 Suppl 1, pp.21S-26S.

Bone quality in treatment of experimental osteoporosis with magnetotherapy

T. Lukač¹, G. Stefanovski², R. Škrbić³, S. Marković⁴

^{1,2,4}Department of Rheumatology, Institute for Physical Medicine Rehabilitation and Balneoclimatology, Kozarska Dubica, Bosnia and Herzegovina

³Department of Pharmacology, Faculty of Medicine, Banja Luka, Bosnia and Herzegovina

Introduction. Magnetotherapy is used in treatment of bone diseases and fractures. Quality of bone is changed in osteoporosis caused by ovarian (estrogen)hormone deficiency. The aim of study was to evaluate the effects of magnetotherapy on osteoporosis caused by ovarian hormone deficiency. **Materials and methods.** 14-weeks-old female Wistar rats (n=21) were randomized in three groups: OVX+PEMF (n=7), OVX (ovariectomized) (n=7) and INT (intact control) (n=7). The accommodation conditions and feeding were the same for all groups temperature 22-24°C. After six weeks the OVX+PEMF group was exposed to pulsed electromagnetic field frequencies of 40 Hz, intensity of 10mT, 45 min per day during five days in a week, for five weeks. At the end of five weeks period the experimental animals (rats) were sacrificed. The biochemical analyses: osteocalcin (OC), alkaline phosphatase (AP), calcium (Ca) and phosphorus (P) were evaluated. The histological analyses of left tibia stained with hematoxylin-eosin (HZ) were studied by routine microscopy. Biochemical properties were tested on TOMI-2001. **Results.** Statistically significant decrease of OC (p<0, 01), AP (p<0, 05) and PHOS (p<0, 01) was obtained in experimental OVX+PEMF group compared to OVX group. Histological analysis showed new bone with regular trabeculae and this bone in the same as the bone in intact control group. Biomechanical properties of femur from treated bone showed same fragility as intact bone **Conclusion.** The applied pulsed electromagnetic fields of 40 Hz, 10mT in 45 min exposure, statistically speaking significantly improves the quality of bone. The results obtained show that the magnetotherapy had a significant role in treatment of estrogen-deficient osteoporosis.

References

- Kalu DN. The ovariectomized rat model of postmenopausal bone loss. *Bone Miner* 1991;15:175-191.
- Chang K, Chang WH. Pulsed electromagnetic field prevent osteoporosis in an ovariectomized female rat model: A prostaglandin E2-associated process. *Bioelectromagnetics* 2003; 24:189-198.

Efficacy of vertebral traction in subacute sciatica of discal origin: a clinical controlled double-blind study

ME Isner-Horobet¹, A Dupeyron², J Lecocq¹

¹Service de Médecine Physique et de Réadaptation, CHU Hautepierre, Strasbourg, France

²Service de Médecine Physique et de Réadaptation, CHU Caremeau, Nîmes, France

Introduction. Vertebral tractions are commonly used in the management of sciatica. However, literature doesn't show significant effectiveness of these techniques. The objective of this study was to investigate the efficacy of spinal traction in subacute sciatica of discal origin. **Materials and methods.** Seventeen patients were included in a prospective, randomized controlled double-blind study. Two groups were compared: a traction group (TRAC) involving patients receiving a tensile force corresponding to 50% of body weight and a control group (CTRL) receiving a tensile force of 10% of body weight. Patients underwent 5 sessions of tractions per week during 4 weeks. Following parameters were assessed: pain on visual analogic scale (VAS), the fingers-to-toes distance (FTTD), the straight-raise leg test (SRLT), Schöber's test, the french validation of disability scale for low back pain (Eifel score), drug intake and patient satisfaction. **Results.** Pain VAS decreased by 62% (60.5±26.4 mm to 23±25.2 mm) in TRAC and 69% (65.2±8.2A 20±14.3) in CTRL. FTTD decreased by 41.1% (34.6±15.2cm to 20.3±9.7 cm) in TRAC versus 45% (38.8±14.7 cm to 21.2±13.2 cm) in CTRL. SRLT increased by 76% (41.8±14.8° to 73.7±20.4°) in TRAC versus 88.8% (40.5±16.8° to 76.5±20.4°) in CTRL. The Schöber's test improved by 48% in TRAC versus 2% in CTRL. The Eifel score decreased from 57% in TRAC versus 61% in CTRL and the drug intake and satisfaction score improved in both groups. These differences were significant in each group (p <0.001) but not significant between them. **Conclusion.** Our study show similar results whatever the type of traction used. Indeed, parameters were identical after traction of 50% or 10% of body weight. One can speculate that there is an effect related to traction, which seems unrelated to the load.

tDCS Combined with Peripheral Agonist/Antagonist Repetitive Stimulation Improves Stroke Outcomes

F. Palermo

University of Nevada, Reno

Introduction. Transcranial direct current stimulation (tDCS) has been shown to improve motor recovery, cognitive function and swallowing in stroke patients. The failure to be embraced by rehabilitation physicians is not clear but may be due to the lack of carry-over effect. Combining peripheral stimulation with tDCS demonstrates both stronger and longer lasting effects. Danger/side effects are minimal. **Materials and methods.** Case report series. A series of 10 sequential patients with chronic stroke rehabilitation following cortical CVA were treated with a combination of affected hemisphere anodal (+) tDCS. The cathode (-) was placed on the opposite shoulder. 12 sq cm electrodes attached to a 1.6 mA current generator. Brain stimulation was maintained for 25 min (40mA-min). EMG patterned stimulation to the affected agonist/antagonist muscles began after the first 10 min. of tDCS. Intensity to motor twitch repeated at 1.5 sec. for 20 min. Treatments were 2 X per week for 10 sessions for upper extremities, 6 for LES. **Outcome Measures.** Pre and post Fugl-Meyer, FIM scores and gait speed were tested. **Results.** All patients improved Fugl-Meyer scoring, average 22 (range 12-31). FIM score improvements 2-6. Gait speed for the 3 treated patients increased from 0.69 to 1.16 m/sec. (age matched nl. 1.77). All patients tolerated treatments well. **Conclusion.** tDCS is safe and easy to apply for rehabilitation physicians. Combining it with peripheral stimulation, increased motor improvement and carry over may be obtained in stroke patients.

References

- Schlaug G, Transcranial direct current stimulation in stroke recovery, *Arch Neurology* 2008.
- Been G, The use of tDCS and CVS as methods of non-invasive brain stimulation. *Brain Res Rev.* 2007.
- Poreisz C, Safety aspects of tDCS concerning healthy subjects and patients. *Brain Res Bull.* 2007.
- Ardolino G, Non-synaptic mechanisms underlie after-effects of tDCS of the human brain, *J Physiol* 2005.

Application of trigger point dry needling in Arnold Chiari I patients, Basic trigger points and effectiveness in 16 patients

Y. Ivánovic-Barbeito, A. Baños, S. Martínez

Centro de referencia estatal de atención a personas con enfermedades raras y sus familias. IMSERSO (State reference center for people with rare diseases and their families. IMSERSO), Burgos, Spain

Introduction. The problem of cervical myofascial pain in Arnold Chiari Type I is a very common problem. In the analyzed series all patients have in common specific trigger points. The aim of the study

is reduction of pain using dry needling. **Materials and methods.** The inclusion criteria was the diagnose of Arnold Chiari malformation type I, the myofascial pain in cervical area was common sign in the 16 patients. Evaluation is applied: before and after study including a VAS, antalgic drugs before and after treatment, classified into three categories (conventional analgesics, opioids and NSAIDs). The period of treatment was 6 sessions over two weeks with dry needling according to protocol and muscles involved in cervical pain, treated with acupuncture needles of 0.25 x25mm for 20 minutes. **Results.** 16 patients: 13 achieved a reduction of more than 4 points on the VAS (4,2), and the antalgic drugs were reduced in at least 2 of the 3 groups determined. **Conclusion.** The rare diseases such as Type I Arnold Chiari Malformation have the difficulty to get larger samples, but even so, the result is encouraging and we will enlarge sample over time.

References

Simple whiplash?. CE. Uzoigwe; F. Shabani; G. Chami, Journal of Bone and Joint Surgery - British Volume, Vol 91-B, Issue 8, 1103-1104
 Calandre L. Headache due to an increase in abdominal pressure. Rev Soc Esp Dolor 1998; 5: 306-309.
 Chiari Type I Malformation Revisited: Diagnosis and Treatment. Cheng, Joseph S. MD; Nash, John BS; Meyer, Glenn A. MD. The Neurologist: November 2002 - Volume 8 - Issue 6 - pp 357-362

The effect of weighted kypho-orthosis on fall risk in women with osteoporosis

Ahmad Raeissadat, Safura Pornajaf, Reza Vahab Kashani
Shabid Beheshti University of medical sciences. department of PM&R -modarres hospital- and Iranian Red Crescent comprehensive rehab. Center,University of social welfare and rehab, Tebran, Iran

Introduction. Osteoporosis as the most common metabolic bone disorder is one of the most important causes of hyper kyphosis and falling in the elderly. There is no consensus about effectiveness of spinal orthosis in improvement of balance and decrease of falling risk in patients with osteoporosis. The aim of this study was To determine effect of Weighted kypho-orthosis(WKO) on fall risk in patients with kypho-osteoporosis. **Materials and methods.** In a clinical trial 31 women with primary osteoporosis via accessible sampling method, were divided in two groups: control (Exercise therapy = 20) and orthosis (Exercise therapy with WKO= 11). Patients were assessed before and after 4 weeks of intervention, using clinical balance tests: (Timed up and go test (TUG), Functional reach test (FRT)and unilateral stance test (UST). After primary assessing with balance measures, patients in control group were included in 4 week home-based daily exercise program. Exercise therapy included Weight bearing, balance and back extensor strengthening exercise .patients in orthosis group applied WKO twice a day, each time one hour. **Results.** At the beginning of the study, there was no difference between two groups in demographic parameters and clinical tests (p ≥ 0. 05). Our data's showed that parameters of TUG and Functional reach test in both groups were improved but Improvement in orthosis group was more (p< 0. 05). Result of UST didn't show statistically significant difference between groups (p ≥ 0. 05). **Conclusion.** Using WKO can improve scores of TUG and Functional reach balance tests and consequently fall risk in kyphotic women with osteoporosis.

The Health Education Impact Questionnaire (heiQ) for evaluation of patient education - intermediate results of the adaption and validation of the German version

M. Schwarze¹, R. Kirchhof¹, G. Musekamp², M. Schuler², I. Ehlebracht-König^{1,3}, S. Nolte⁴, R. Osborne⁵, H. Faller², C. Gutenbrunner¹
¹Coordination Centre for Applied Rehabilitation Research, Department of Rehabilitation Medicine, Hannover Medical School, Germany
²Institute for Psychotherapy and Medical Psychology, Division of Rehabilitation Sciences, University of Würzburg, Germany
³Rehabilitation Centre Bad Eilsen of the German Pension Insurance Braunschweig-Hannover, Germany
⁴Association of Dermatological Prevention, Center of Dermatology Buxtehude, Germany
⁵School of Health and Social Development, Deakin University, Australia

Introduction. Recent findings suggest that an appropriate evaluation of patient education programs should be based upon proximal factors like empowerment and self-management skills. In Germany however evaluation of such programs has so far been conducted

mainly through long-term, distal target criteria. The translation of the generic "Health Education Impact Questionnaire" (heiQ) into German aims to improve this lack of a German instrument capable of evaluating these criteria. **Materials and methods.** The translation was accomplished according to international guidelines. Next step will be the analysis of the psychometric quality of the questionnaire leading to a sample of nearly 1200 rehabilitation patients. In order to identify possible more fitting translated item variants floor and ceiling effects, one-dimensionality of the scales and internal consistency an interim analysis based on data from 229 patients was conducted. **Results.** The German translation of the heiQ turns out as an understandable and content-valid version of the original. Moreover the interim analysis states the German heiQ to have well to excellent psychometric properties, and hardly any floor and ceiling effects. Six of the eight scales can be mapped in a one-dimensional model (RMSEA < .05) and Cronbachs Alphas were between .72 and .89. Four alternative item formulations were developed in anticipation of better results. **Conclusion.** It is anticipated that the German heiQ will provide good psychometric characteristics. Complete data analysis will show, whether the new items result in better model fit. It is intended using the German heiQ version for quality assurance in the German patient education system.

References

Faller H, Reusch A, Vogel H, Ehlebracht-König I, Petermann F. Patientenschulung. Rehabilitation, 2005;44. 277-286.
 Osborne, RH, Elsworth, GR, Whitfield, K. The Health Education Impact Questionnaire (heiQ): an outcomes and evaluation measure for patient education and self-management interventions for people with chronic conditions. Patient Education and Counseling, 2007;66.192-201.

Use of chemical neurolysis with phenol in reducing serious spasticity and work load for individuals in vegetative state. A randomized clinical trial.

A. Giattini; A. Bonamartini; K. Cerquetti, E. Calderisi, L. Dionisi, M. Vallasciani
Istituto di Riabilitazione S. Stefano, Porto Potenza Picena (MC) Italy

Introduction. Individuals in vegetative state are often affected by spasticity which is an important obstacle in caring, in particular in nursing operations. Phenol is one of the most used substance in treating local spasticity, also if its use is limited to the principal nerves of the limbs¹. The aim of this study is to verify if the treatment of spasticity with phenol is useful reducing work load and time in nursing operations. **Materials and methods.** We enrolled 11 patients admitted in two centers, affected by spasticity of upper and lower limbs. Patients of group A (6) were treated with injections of 5 ml of aqueous phenol solution at 6%, in tributary nerves^{2,3} of muscles of the limbs interested of the spasticity. In group B, patients (5) were enrolled, evaluated and treated with phenol 6 months later. Then we reversed the treatment (cross-over) for 6 months. Before the injection, patients were evaluated in their Range of Motion of elbow and hip (adduction) and in calculating nursing time (washing, wound dressing, etc.). **Results.** Immediately after the injections almost all the patients had a significant increasing of ROM (C.I. 95%, P<0.001) not observed in non-treatment period. The statistical correlation of other parameters gave a significant reduction (C.I. 95%, P<0.036) in nursing time and in increasing ROM. The NNT was 2. **Conclusion.** Using of phenol in reducing spasticity can be useful in improving quality of caring in patients in vegetative state.

References

1. AANEM Workshop Kishner S. Chemical Neurolysis with Phenol 45th Annual Scientific Meeting. 1998.
 2. Kenna M. et al (1990) Percutaneous phenol block of the musculocutaneous to control elbow flexor spasticity J Hand Surgery;2:340-6.
 3. Trainer N. et al. (1986) Obturator nerve block for painful hip in adult cerebral palsy Arch Phys Med Rehabil ;67:829-30.

Comparative study of pressure distribution with different anti-sore cushion between chronic paraplegia and body mass index

Leire Ortiz Fernández, Nora Civicos Sanchez, M^a Luisa Jauregui Abrisqueta, Montserrat Cuadrado Rebollares, Jon Uriarte Urizar, M^a Paz Abaitua Ezquerria, Amaia Madariaga Zabala
Hospital de Cruces, Barakaldo, Spain

Introduction. To determine and compare pressure distribution (PD) in sitting position between 3 anti-sore cushions and paraplegic

patients according to body mass index (BMI). **Materials and methods.** Comparative study of PD among chronic paraplegic individuals who use manual wheelchair propulsion. The sample was divided in 2 groups according to BMI: group I ≤ 25 ; group II > 25 . Demographic variables, type and level of injury, mean pressure (MP), peak pressure (PP), contact area (CA), PD were measured with a high resolution mapping system. Variables were registered during 1 minute on the own wheelchair after staying 5 minutes on static seated posture. Measurement was made on 3 different high quality anti-sore cushions: foam (C1), gel (C2) and air (C3). **Results.** 20 patients, (Male:Female=17:3). Mean age: 41.2 years. Mean time from injury onset: 119,9 months. Mean BMI: group I 21.81; group II 30.43. There was statistically significant difference among 3 cushions in terms of MP ($p < 0.0001$) and PP ($p < 0.0001$). C3 showed better PD followed by C1 in all individuals. With regard to BMI, there was statistically significant difference between groups for C1 ($p = 0.016$) and for C3 ($p = 0.007$) as for MP. Group II showed higher CA among 3 cushions with statistically significant difference. No statistically significant difference was found regarding PP between 2 groups. **Conclusion.** According to our experience, individuals with BMI ≤ 25 had better PD with each cushion, moreover, air cushion showed the best behaviour. Pressure mapping systems seem to be appropriate for identifying areas at risk for pressure ulceration. Consequently, it can be helpful to choose the most suitable anti-sore cushion.

References

Elser JJ, Gefen A. Is Obesity a Risk Factor for Deep Tissue Injury in Patients with Spinal Cord Injury? *J Biomech.* 2008;41(16):3322-31.

Physical therapy after anterior arthroscopic bankart repair

Desanka Mitrovic, I. Diklic, D. Bogdanovic, I. Miljkovic
Institute for Orthopaedic Surgery "Banjica", Belgrade, Serbia,

Introduction. Until now it was considered that the arthroscopic Bankart repair of the anterior shoulder instability was less reliable method of reconstruction than of the open one, causing a longer period of postoperative immobilization to heal repair tissue and delay rehabilitation. **Materials and methods.** The aim of this research was to show clinical results of postoperative immobilization and rehabilitation after Bankart repair anterior to shoulder instability. From March 2005 to January 2006 there were 29 arthroscopic reparations anterior Bankart lesion using bioresorption Anchor. The average clinical monitoring of patients was amounted to 34 months. There were 21 men and 8 women with a mean age of 19.5 year. In this study there were no active athletes. Accelerated post-operative rehabilitation have started the second postoperative day and consisted of exercises to increase mobility and strength of shoulders divided into phase. The external rotation is greater than 30 degrees and is not allowed until the sixth postoperative week. The protocol was used by the kinesiotherapy "Banjica". Analysis health outcomes related to pain, range of motion, return to activities, recurrent instability and opinions patient. For this purpose a questionnaire was used by the society of American Shoulder and Elbow Surgeons (ASES). **Results.** In this investigation there was no recurrent instability. Three cases were positive provocation test instability. In one patient until the 14th postoperative day the pain was present with less intensity. All patients achieve the full scope of mobility and all the activities before injury were returned. **Conclusion.** Short-controlled immobilization and early rehabilitation after arthroscopic Bankart repair are a safe method of renewal postoperative shoulder function at the group of patients.

References

Wilk KE, Reinold MM, Andrews JR: Postoperative treatment principles in the throwing athlete. *Sports Medicine and Arthroscopic Review*; 2001;9:69-95.
enters, T. R., A. K. Franta, et al. (2007). "Arthroscopic compared with open repairs for recurrent anterior shoulder instability. A systematic review and meta-analysis of the literature." *J Bone Joint Surg Am* 89(2): 244-54.

Physical therapy after liposuction surgery

Desanka Mitrovic, Velisa Arsic, Snezana Filipovic
Institute for Orthopaedic Surgery "Banjica", Belgrade, Serbia,
Analife 4D Clinic for Aesthetic Surgery, Belgrade, Serbia
Institute for pulmonary diseases, Belgrade, Serbia

Introduction. Classical or laser liposuction is the operative method that selectively removes fat from those parts of the body where the excessive is accumulated. Classical liposuction is performed

under general anesthesia, and this method mechanically destroy fat cells that are absorptive special cannulas. This study was performed with smartlipo pulsed 1064-nm Nd:YAG laser. Patients were under analgosedation with them in the treated region embedded solution containing adrenaline and anesthetic. Liposuction is the removal of excess fat bulges from areas of the body using suction tubes that are inserted into the body through small incisions. A vacuum pump is then attached to the hoses to remove the fatty cells. **Materials and methods.** After both surgical techniques that inevitably arise edema and hematomas in the treated region, which disappear for eight to ten weeks. In the period from January 2008 to December 2009 at the Clinic for Aesthetic Surgery performed surgery in 50 patients with laser liposuction. There were 40 women and 4 men, average age 37 years. All patients treated with the abdominal, gluteal and femoral regions. **Results.** After surgery, all patients wore an elastic garment for a period of two weeks. Then they examined and treated for implementation of physical therapy. Physical treatment for all patients consisted of lymph drainage, manual massage and ultrasound to rapid withdrawal edema. Laserotherapy anti-inflammatory frequencies is used to remove the hematoma due. Exercises for abdominal, pelvic and femoral muscles were, with a gradual increase in intensity. The program is carried on the first day. In 35 patients after three weeks there was a total withdrawal swelling and hematoma, for four weeks in 12 patients, while only in 3 patients treatment lasted six weeks. **Conclusion.**

Based on the results achieved can be concluded that physical therapy accelerates recovery after liposuction and finds its place in aesthetic surgery.

References

Grab and Smith's plastic surgery sixth edition by Charles H. Thorne Smart lipo Downtime. Copyright 2007.

Program of patient's rehabilitation after covering of soft tissue defects of achilles region with distal based fascial and fasciocutaneous lobe

R. Djokic, Z. Curcic
Institute for Orthopaedic Surgery "Banjica", Belgrade, Serbia,

Introduction. Introducing procedures of distal based fascial and fasciocutaneous calf lobe in surgery, significantly change view on treatment of soft tissue defects of Achilles region. **Materials and methods.** Method of distal based fascial and fasciocutaneous calf lobe is simple and is done in one act. Postoperative treatment is based on plaster immobilization with foot in equinus for six weeks period. After immobilization removed walk with crutches and partial or full rest upon leg is allowed, also exercises for full range of movement of ankle and strengthening of leg and foot muscles are introduced. Rehabilitation period lasts four to six weeks. **Results.** Shortages of this procedure are lateral foot anesthesia due to cutting of n.suralis and its incorporation in lobe, and morbidity of graft region if secondary defect is covered with free skin transplant. In last four years 29 patients with soft tissue defect of Achillar region caused by trauma or operation have been treated at IOHB "Banjica". All lobes stayed vital, lobe vein path is developed in 8 cases, partial necrosis of edges in 5 cases. Active motion of ankle after rehabilitation was without restrain in all patients. **Conclusion.** Reconstruction of the lower leg and foot with the reverse-pedicled anterior tibial flap: preliminary report of a new fasciocutaneous flap

References

British Journal of Plastic Surgery, Volume 39, Issue 3, Pages 327-337J. Wee
Reconstruction of open contaminated achilles tendon injuries with soft tissue loss. *J Trauma.* 2009 Mar;66(3):774-9.
Single-stage reconstruction of Achilles tendon injuries and distal lower extremity soft tissue defects with the reverse sural fasciocutaneous flap. *J Plast Reconstr Aesthet Surg.* 2008;61(5):566-72. Epub 2007 Mar 26.

Physical therapy after liposuction surgery

Desanka Mitrovic, Velisa Arsic, Snezana Filipovic
Institute for Orthopaedic Surgery "Banjica", Belgrade, Serbia,
Analife 4D Clinic for Aesthetic Surgery, Belgrade, Serbia
Institute for pulmonary diseases, Belgrade, Serbia

Introduction. Classical or laser liposuction is the operative method that selectively removes fat from those parts of the body where the excessive is accumulated. Classical liposuction is performed under general anesthesia, and this method mechanically destroy fat cells that are absorptive special cannulas. This study was

performed with smartlipo pulsed 1064-nm Nd:YAG laser. Patients were under analgesodation with them in the treated region embedded solution containing adrenaline and anesthetic. Liposuction is the removal of excess fat bulges from areas of the body using suction tubes that are inserted into the body through small incisions. A vacuum pump is then attached to the hoses to remove the fatty cells. **Materials and methods.** After both surgical techniques that inevitably arise edema and hematomas in the treated region, which disappear for eight to ten weeks. In the period from January 2008 to December 2009 at the Clinic for Aesthetic Surgery performed surgery in 50 patients with laser liposuction. There were 40 women and 4 men, average age 37 years. All patients treated with the abdominal, gluteal and femoral regions. **Results.** After surgery, all patients wore an elastic garment for a period of two weeks. Then they examined and treated for implementation of physical therapy. Physical treatment for all patients consisted of lymph drainage, manual massage and ultrasound to rapid withdrawal edema. Laserotherapy anti-inflammatory frequencies is used to remove the hematoma due. Exercises for abdominal, pelvic and femoral muscles were, with a gradual increase in intensity. The program is carried on the first day. In 35 patients after three weeks there was a total withdrawal swelling and hematoma, for four weeks in 12 patients, while only in 3 patients treatment lasted six weeks. **Conclusion.** Based on the results achieved can be concluded that physical therapy accelerates recovery after liposuction and finds its place in aesthetic surgery.

References

Grabb and Smith's plastic surgery sixth edition by Charles H.Thorne Smart lipo Downtime. Copyright 2007

Using the International Classification of Functioning, Disability and Health (ICF) Core Sets for Spinal Cord Injury (SCI) in epidemiological studies: The Swiss Spinal Cord Injury Study (SwiSCI) as an example

Christine Boldt^{1,2}, Inge Eriks-Hoogland¹, Erik von Elm^{1,3,4}, on behalf of the SwiSCI core team:

¹Swiss Paraplegic Research (SPF), Nottwil, Switzerland

²ICF Research Branch of the WHO FIC Collaborating Center (DIMDI) at Swiss Paraplegic Research (SPF), Nottwil, Switzerland

³Department Health Sciences and Health Policy, University of Lucerne and at SPF, Nottwil, Switzerland

⁴German Cochran Centre, University Medical Center Freiburg, Freiburg, Germany

Introduction. A SCI is accompanied by a variety of impairments, activities limitations and participation restrictions. To understand the full impact on functioning, research should be of comprehensive and multidisciplinary nature. The (ICF) provides a framework and universal language to describe human functioning and the experience of health and disability. Objective: Present how the ICF core sets for SCI can be used in for epidemiological studies in order to select "what" and "how" to measure, using SwiSCI as an example. **Materials and methods.** First, the categories of the ICF core sets for SCI were clustered in meaningful groups. Second, systematic searches of PubMed from 1993-2008, using the terminology of the ICF and expert selected terms, were performed. For participation and environmental factors meaningful concepts of focus groups (persons with SCI) were linked to the ICF. Third, of all studies retrieved, dependent and independent variables were linked to the ICF using standardized rules and listed in a matrix. Last, all measurements included in the studies were linked and added to the matrix. Based on multidisciplinary expert opinion (relevance for SwiSCI, burden for the participant, robustness of the measurement, costs) final selection of variables and measurements for SwiSCI was performed. **Results and conclusion.** 30 systematic searches were performed. The ICF provides a valuable reference to classify the variables used in relevant studies in SCI. It shows that there are both commonalities and differences regarding the assessed variables and the instruments used to address those variables. This emphasizes the need for a standardization regarding both what to measure and how to measure. Regarding what to measure, it reflects that the ICF Core Sets for SCI can be used as a reference for comparisons and as basis to decide what should be taken into account to comprehensively address functioning in SCI.

Using the ICF Core Sets for Spinal Cord Injury (SCI) as a reference: a comparison with established SCI data sets

I. Eriks-Hoogland¹, A.Cieza^{1,2}, R. Hilfiker¹, M.Post³, H. van Hedel⁴, R. Cripps⁵, Y. Chen^{6,7}, C. Boldt^{1,8}, G.Stucki^{1,8,9}

¹Swiss Paraplegic Research (SPF), Nottwil, Switzerland

²ICF Research Branch of the WHO FIC CC (DIMDI)– Department of Physical Medicine and Rehabilitation, Ludwig-Maximilian University, Munich, Germany

³Rehabilitation Center de Hoogstraat and Rudolf Magnus Institute for Neuroscience, Utrecht, the Netherlands

⁴SCI Research, Spinal Cord Injury Center, University of Zurich, Balgrist University Hospital, Zurich, Switzerland

⁵Flinders University, School of Medicine, Prevention, Promotion and Primary Health Care, Australia

⁶Department of Physical Medicine and Rehabilitation, School of Medicine, University of Alabama at Birmingham, Birmingham, Alabama, USA

⁷National Spinal Cord Injury Statistical Center, Alabama, USA

⁸ICF Research Branch of the WHO FIC Collaborating Center (DIMDI) at Swiss Paraplegic Research (SPF), Nottwil, Switzerland

⁹Department Health Sciences and Health Policy, University of Lucerne and at SPF, Nottwil, Switzerland

Introduction. The Spinal cord injury (SCI) literature is very heterogeneous regarding outcomes. The absence of a uniform framework and language makes it difficult to compare data among different studies. The objective of this study is to identify outcome parameters of established data sets in SCI, using the ICF Core Sets for SCI as reference. **Materials and methods.** An systematic search of PubMed from 1998-2008 was performed to identify longitudinal studies in SCI. Of the selected studies, all variables were linked to categories of the ICF using standardized rules and a matrix was developed including all the ICF categories identified and documenting which of them were addressed by which of the data sets. In addition to the ICF Core Sets for SCI and the ISCoS data sets, seven currently published data sets were included in the matrix and the comparison. **Result and conclusion.** 1583 publications were identified based on the applied systematic literature search. Four longitudinal studies were selected; The American Model Systems Database^{*}, The Australian ASCIR Register, the European Multi center study about Spinal Cord Injury (EMSCI) and the Dutch research program "Physical strain, work capacity, and mechanisms of restoration of mobility in the rehabilitation of persons with spinal cord injuries". The ICF provides a valuable reference to classify the variables used in relevant studies in SCI and the ISCoS data sets. It shows that there are both commonalities and differences regarding the assessed variables and the instruments used to address those variables. This emphasizes the need for a standardization regarding both what to measure and how to measure. Regarding what to measure, it reflects that the ICF Core Sets for SCI can be used as a reference for comparisons and as basis to decide what should be taken into account to comprehensively address functioning in SCI.

Influence of passive shoulder Range of Motion limitations on Activities and Participation in persons with Spinal Cord Injury

I.E. Eriks-Hoogland¹, S. de Groot^{2,4}, M.W.M. Post³, L.H.V. van der Woude⁴

¹Swiss Paraplegic Research, Nottwil, Switzerland

²Rehabilitation Center Amsterdam, Amsterdam, the Netherlands

³Rehabilitation Center de Hoogstraat and Rudolf Magnus Institute for Neuroscience, Utrecht, the Netherlands

⁴Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen, The Netherlands

Introduction. Upper extremity function is for persons with spinal cord injury (SCI) of uppermost importance. Unfortunately, whilst dependent on their upper extremities for many task, they are also at risk to develop shoulder joint range of motion (ROM) limitations. A limited shoulder ROM might be clinically relevant because of the hypothesised relation with limitations in the performance of activities and participation. This study investigates the effect of shoulder ROM limitations in newly injured persons with paraplegia and tetraplegia at discharge from first rehabilitation (t1) and the performance on activities (functional independence measure (FIM), wheelchair performance (WC), making a transfer) and participation (Physical Activity Scale for Individuals with Physical Disabilities (PASIPD)) one year after discharge (t2). **Materials and methods.** Of 146 persons shoul-

der ROM was measured at t1. FIM score, PASIPD score, performance time on items of the WC and ability to make a transfer was assessed at t2. **Results and conclusion.** 70% of the participants was male, 64% paraplegic, 48% AIS A, 16% AIS B, 19% AIS C and 14% AIS D). 30% Of the subjects (n=44) had a limited shoulder ROM. 29% of the subjects had a limited shoulder flexion (n=42), 18% (n=26) a limited shoulder external rotation and 0.4% a limited shoulder abduction (n=6). Persons with a SCI with a limited shoulder ROM at discharge from first rehabilitation showed to be more limited in their activities one year after discharge, as measured with the FIM motor score and ability to make a transfer without assistance of a person. For the total group the study showed that subjects with a shoulder ROM need more time to fulfil the WC items. The latter was not found in subjects with a tetraplegia. No significant relation was found between limited shoulder ROM and the sum score of the PASIPD in either group.

A “New” system of muscular strain and the role of stretch reflex in strength measure

M. Migliorini^{1,2}, A. Ravaschio¹, P. Lippi³

¹Reparto di Riabilitazione e Rieducazione Funzionale “Prof. Luigi Grimaldi”, Barga

²Master in Riabilitazione dei Disordini Muscoloscheletrici - Università di Genova

³Ausl3 Pistoia

Introduction. Aim of the work is to detect changes in speed of stretch reflex threshold and its clinical implications in chronic stroke patients, assessed before and after administration of therapeutic exercise “Sudden Passive Muscle Shortening” (SPMS – Grimaldi’s Method), in wrist and fingers flexor muscles. **Materials and methods.** Were selected 30 subjects (20 chronic stroke patients and 10 normal subject) divided equally into 3 groups (A, B, C). The spasticity assessment was performed using Modified Ashworth Scale (MAS) and the measurement of speed limit (speed of onset of EMG signal of the wrist and fingers flexor muscle) before and after administration of SPMS. The duration of the exercise was 15 minutes and each group was treated at different angular velocities: V = threshold (group A), V = 180° / s (group B) and V = 286° / s (group C). **Results.** A variation of the V-Threshold was found only for Group A (Ha: mean (diff) > 0, Pr (I T | > I t |) = 0.0615), together with a variation on the MAS, while in the group B, there is no statistical variation superimposed (Ha: mean (diff) = 0 Pr (I T | > I t |) = 0.2839). In group C, as already known in literature, was not detected at a occurrence’s threshold of SR within 286 ° / s. **Conclusion.** From the clinical point of view, the most obvious changes were noted in Group A with appreciable correlations between administration of SPMS in V threshold, the threshold shift and reduction of spasticity. The treatment at threshold results suggest that, in agreement with literature, this treatment may lead to a reorganization of the CNS and to ‘learning’ new motor patterns.

References

M. Levin, A. Feldman. (1994) Brain Research 657(1-2).
A. Calota, A. Feldman, M. Levin. Clinical Neurophysiology 2008;119:2329-2337.

Facial nerve palsy in children – the importance of etiology

M.J. Azevedo, F. Ramada, L. Sá, A. Castro

Centro Hospitalar do Alto Ave, Guimarães, Portugal

Introduction. Facial nerve palsy is a common malady in children, and may be acquired or congenital¹. The most common causes of acquired facial palsy are infectious, traumatic, neoplastic and idiopathic. Congenital facial paralysis is classified as traumatic or developmental¹. History, physical examination and often imaging and electrophysiological studies help to determine the etiology. This is important because prognosis and treatment depends on the underlying pathophysiology². While congenital causes have poor prognosis for recovery of function, traumatic and Bell palsy generally have good prognosis with minimal, if any, disfunction¹. Besides treating the specific cause, management should include eye care, drugs, physical therapy and surgery². **Clinical cases.** The authors describe 4 clinical cases of children aged 0 to 5 years old, observed and treated in our unit, with different types of facial nerve palsy (traumatic, infectious, congenital and idiopathic), highlighting the differences and difficulties in diagnosis and treatment according to etiology. The outcome in traumatic and infectious cases was outstanding, even with short-term physical treatment, whereas in congenital and idiopathic cases, results were disappointing. **Conclusion** Defining the etiology

of facial nerve palsy is an essential part in outlining treatment regimen and establishing a prognosis. In acquired cases, the rate of recovery is inversely related with the degree of neuronal damage and paralysis. Physical treatment acts in maintaining muscular tone until the return of the nervous input. However, in congenital paralysis, the goal is to minimize asymmetries and to improve global function. Botulinic toxin and surgical exploration can also be helpful.

References

1. Chapman K. et al, Facial nerve palsy in children, Uptodate 17.1, last literature review January 2009, accessed on February 2010.
2. Holland NJ, Weiner GM. Recent development in Bell’s palsy – clinical review, BMJ 2004;329:553-7.

Wrist pain due to scaphoid fracture

M.Ad. Farago, M.S. Pop, F. Cioara

University of Oradea, Faculty of Medicine, Romania

Introduction. A fracture of the scaphoid usually happens from falling on an outstretched hand, with the weight landing on the palm. Pain and swelling in the wrist are the main symptoms. The aim of this study was to assess the impact of clinical changes on hand function in relation with repetitive wrist trauma during sport activity. **Materials and methods.** Over a period of ten months, a number of 21 male out patients involved in amateur sport practice – break dance, were referred to the rehabilitation department for persistent wrist pain and dysfunction. In order to sustain differential diagnosis between sprained wrist and local fracture, clinical, functional, X-ray and imaging (MRI at 3 patients) evaluation were performed. After fracture healing, patients underwent an intensive ten-session rehabilitation program. **Results.** Scaphoid fracture was diagnosed at 7 patients (33,33%) and was interpreted as stress fracture. With cast protection, fracture healed spontaneously at five patients (71,42%). Two patients (28,58%) with fracture in the middle and the proximal pole of the scaphoid needed surgery to be treated. Rehabilitation results: no rest pain and normal range of movement at all patients; pain in the base of the thumb by hand grips at four patients (57,14%); the force and the fine precision of the grip pinch remained altered at two patients (28,57%). Four patients (19,04%) from twenty one, three of them with scaphoid fracture, considered to give up break dancing. **Conclusion.** Amateur sport practising would require special attention, measures of precaution including protective devices in preventing injuries. To avoid injuries, and to keep people exercising, it would be necessary to expand the specialized controlled training to amateur sporters including dancers.

Osteoporosis overdiagnosed in elderly with backpain

S.M. Pop, M.Ad. Farago

Romania, University of Oradea, Faculty of Medicine

Introduction. A great percent of back pain in elderly is related to traumatic or stress osteoporotic fractures. Osteoporosis is over diagnosed, sometimes covering other diseases. We present the case of three elderly female patients with persistent back pain, treated for osteoporosis which turned to be multiple myeloma. **Materials and methods.** We followed up three in patients, mean age 68,2 yr, with long term history of permanent back pain with un-systematized irradiation in the lower limb. Previous investigations as in and out patients in different medical departments relived osteoporosis, degenerative joint diseases and anxiety. They underwent non-steroidal anti-inflammatory drugs, antiresorptive treatment, vitamin-D and calcium supplementation and regular exercise. For persistent pain patients were referred to rehabilitation department for specific treatment. **Results.** Clinical, functional, biological and imagistic evaluation were performed on the patients. The clinical evaluation relived tenderness at the percussion of the spinous processes of the dorsal and lumbar vertebrae, limited spine range of motion with no neurological signs. Laboratory evaluation showed: positive tests for inflammation (ESR, C reacting protein) and the new radiographic features, lytic lesions in column and the pelvis. Further investigations needed to be performed. Bone marrow investigation showed high percentage of plasma cells which confirmed the multiple myeloma. In this situation patients were counter indicated to physiotherapy and were referred to haemathology. **Conclusion.** In the presence of chronic back pain, patients with osteoporosis need to be further investigated for diagnostic purposes. The limits of X-Ray evaluation and the lack of biological evaluation delayed the diagnosis and the proper treatment. Finally, we concluded that, sometimes osteoporosis is over-diagnosed, patients with back pain needing to be reevaluated.

The Effects of Plyometric Exercises on Functional Tests in Athletic and Non-Athletic Women

Navid Taheri, Abasali Purmomeni

Faculty of Rehabilitation, Isfahan University of Medical Sciences, Isfahan, Iran

Introduction. Designing a complete rehabilitation program for musculoskeletal disorders require special attention toward clinical factors and functional abilities. Neuromuscular control of lower limbs will prevent recurrent injuries. Playometric exercises are neuro-muscular and closed kinematic chain training, which improve joint proprioception and stability (1). **Materials and methods.** The design of this study is clinical trial, which was done in 60 women (30 athletic and 30 non-athletic, ages 20-30). Both groups divided into two equal subgroups (case and control). Evaluations of both groups were done before and six weeks after, but during this time, only the case groups had Plyometric Exercises. The measurement tests included: Vertical Jump test(VJ), Single Leg Hop for Distance (SLHD), Single Leg Hop for Time (SLHT), Modified Rhomberg on BAPS (MRB), Hop Stress Test (HST). All data were analyzed by SPSS software. **Results.** In cases of non-athletic group HST, VJ, SLHT significantly improved. In cases of athletic group SLHD and MRB improved significantly. **Conclusion.** Plyometric exercises are useful approach to improve functional ability and neuromuscular control and recommend for advance therapeutic programs.

References

1. Prentice W. Rehabilitation Techniques for Sports Medicine and Athletic Training. 4th edition, McGraw-Hill, 2004.

Rehabilitation of acute vascular, nerve, and tendon injuries. Case report.

S. González Burgos, L. Platas Gabriel, L. García Delgado, A. Mas Mas Hospital Clínico San Carlos. Madrid. Spain.

Introduction. A 25-year-old male without medical history importance. Our patient suffers a glass cutting in ulnar-sided right wrist resulting in section of ulnar artery, ulnar nerve and superficial and deep flexors of the 3rd, 4th and 5th fingers. He has been treated in the emergency department of our hospital the same day of his injury. He has been done a superficial and deep tendon suture, an ulnar artery and nerve suture, and finally a dorsal splint during 47 days. **Materials and methods.** Physical examination : keloid and hypertrophic scar opened at 2 points, swelling and edema on hands and fingers. Evaluation of wrist joint: 0° dorsal flexion (DF), 20° palmar flexion (PF), 3/5 overall muscular balance, fist: 10 cm missing. End and lateral terminal clamps: not achieved. Thumb opposition: 10°. Stiffness of the metacarpophalangeal joint (MCP) and proximal interphalangeal (PIP) from 2 to 5 fingers with less than 10° overall flexion. 0° MCP, -40° PIP, IFD is not achieved. Immediate treatment with passive and active kinesitherapy begins, making a total of 110 sessions from June 2009 until January 2010. **Results.** At the end of the treatment his physical examination was: 55° DF, 80° PF, 90° pronation, 90° supination, 35° radial deviation and 20° ulnar deviation. Digital Tweezers: ET full maximum resistance. Definite discharge on January 2010. **Conclusion.** The rehabilitation treatment in an early and continued way assists the evolution of complex vascular, nerve and tendon injuries. An early correction of these injuries makes that the rehabilitation treatment started before and that complications due to the injury were minor. A prolonged immobilization aggravates the evolution and prospects for improvement in this type of injuries.

References

- Rehabilitation after surgery for flexor tendon injuries in the hand. The un B Thien, Jeroen H Becker, Jean-Claude Theis. Issue 1, 2009.

The effect of Monochromatic Infrared Energy in pain and wound healing

M.J. Azevedo, F. Ramada, L. Sá, A. Castro, I. Ruvina

Centro Hospitalar do Alto Ave, Guimarães, Portugal

Introduction. Venous and arterial ulcers are difficult to manage and often do not heal, even with aggressive medical treatment.^{1,2} Monochromatic Infrared Energy (MIRE) increases nitric oxid, which has effect in wound repair, skeletal muscle injury and pain². The purpose of this study is to determine the effect of 890 nanometer MIRE on pain and wound healing in patients with venous and arte-

rial ulcers that failed to repair with conservative treatment. **Materials and methods.** Patients maintained previous conventional treatment and underwent once or twice daily MIRE therapy, 5 times a week for 1 month. Patients were observed before, during and 1 month after treatment. Pain (Visual Analog Scale - VAS), and multiple wound characteristics were assessed, with pictures being taken at each session. **Results.** Seven patients entered the study (5 females), with an age average of 71 years. Four patients had venous ulcers, and 3 of them had arterial ulcers, with a mean evolution of 2 years. There was a general improvement in wound characteristics. The greatest effect was noted in a patient whose ulcer reduced from 17x7cm to 13,5x4,5cm. Mean size reduction is 0,94x0,73cm. There was an average wound depth reduction of 0,2cm. One month after treatment one patient still improved his wound while others maintained the results. An average of 2 point reduction in VAS was noted. **Conclusion.** MIRE therapy is a noninvasive, drug-free method for potentially healing chronic wounds resistant to conventional modalities. Use of MIRE on the subjects described contributed to decreased pain and enhanced healing of their ulcers. Additional research is needed with wider populations and longer periods of treatment.

References

1. Nather A. et al. Anodyne therapy for recalcitrant diabetic foot ulcers: a report of four cases, Journal of Orthopedic Surgery 2007; 15(3):361-4.
2. Ortwitz LR. et al. Augmentation of wound healing using monochromatic infrared energy, Advances in wound care 1999; 12(1):35-40.

Influence of second phase of rehabilitation on quality of life and functional capacity after coronary artery bypass graft surgery

Una Nedeljkovic, Nevena Krstic, Slavica Varagic Markovic, Emilija Dubljanin Raspopovic, Nela Ilic, Vladislava Vesovic Potic Clinical Center of Serbia, Physical medicine and Rehabilitation Clinic, Belgrade, Serbia

Introduction. While cardiac rehabilitation programs tend to vary, they all include interventions designed to optimize patient's physical, psychological and social functioning. Our objective was to determine patient's quality of life (QoF) and functional status one year after coronary artery bypass graft surgery (CABG) and whether second phase of rehabilitation influence them. **Materials and methods.** Sixty six patients admitted to the hospital in one month period for CABG, fulfill Short form questionnaire (SF-12) and Duke Activity Status Index questionnaire (DASI) prior to operation and then one year after. They were also asked about participation in rehabilitation programs postoperatively. Descriptive statistics, paired sample and independent sample test were done in data analyze. **Results.** Fifty three patients completed questionnaire postoperatively. There was statistically significant improvement in SF-12 physical status and DASI (p<0.05). Analyze of groups regarding participations in second phase rehabilitations programs didn't reveal statistically significant difference in outcome measures. Groups didn't differ in age, educational status and other diseases. **Conclusion.** This research points out the necessity for better organization of third phase of rehabilitation program in our country as the benefits of second phase are not long lasting.

References

1. Eagle KA, Gytton RA ,Davidoff R, Edwards FH, Ewy GA, Gardner TJ et al. ACE/AHA guideline update for coronary artery bypass graft surgery. Circulation 2004; 110(14):340-437
2. Koch CG, Khandwala F, Cywinski JB. Health related quality of life after coronary artery bypass grafting: A gender analysis using the Duke Activity Status Index. J Thorac Cardiovasc Surg 2004; 128: 284-295

Constant shoulder score (CSS): there is no difference in strength, pain and total score between measures in abduction and elevation.

C. Burrus^{1,3}, O. Deriaz³, A. Almeida², G. Fanti², C. Favre², F. Gerber², B. Wijnants², M. Konzelmann¹

¹Service de réadaptation de l'appareil locomoteur, Clinique romande de réadaptation suvaCare, Sion, Switzerland

²Service de physiothérapie, Clinique romande de réadaptation suvaCare, Sion, Switzerland

³Institut de recherche en réadaptation-réinsertion, Sion, Switzerland

Introduction. The CSS has been used for 25 years to assess shoulder function. Abduction appeared to us to be limited by pain, particularly in case of rotator cuff problems and was thought to be less functional and more painful than anterior elevation. The purpo-

se of this study was to compare the assessment of isometric strength in elevation and abduction and its effect on pain and total CSS. **Materials and methods.** The study ran between August 2008 and November 2009. The CSS was measured the day following admission, strength being assessed both in elevation and in abduction in the scapular plane with an Isobex® dynamometer, the first position tested being randomized. Pain was assessed with a 100mm Visual Analog Scale (VAS) and total CSS following recommendations. Correlations and paired T-test were used. **Results.** 52 patients were included, 50% of them having rotator cuff injury. Mean strength on the affected side was 3.4kg±2.39 in elevation and 3.2kg±2.33 in abduction (7.71±2.9 and 7.39±2.8 on the healthy side). We found no difference between the 2 positions. Pain was found to be slightly lower after elevation (4.78±2.83 vs 5.01±2.94 on the affected side; 0.67±1.65 vs 0.72±1.73 on the healthy side), but not statistically different. The total score was similar in elevation and in abduction on the affected side (45.72±15.02 vs 45.32±14.98), and on the healthy side (88.16±8.60 vs 87.50±8.94) with no difference found. **Conclusion.** No difference in strength, pain and total score was found when measuring strength in elevation compared with abduction. Either position could be used for strength assessment in the CSS. And we think that the measure in elevation is more functional than in abduction.

References

Constant. Clin Orthop Relat Res 1987.

Motor aphasia after acute surgery for ruptured proximal middle cerebral artery aneurysm: case report

M.J. Leite, A. Camelo Pinto

Service of Neurosurgery and PRM (Unit of brain lesions), Centro Hospitalar do Porto, Hospital Santo António, Porto, Portugal

Introduction. Aneurysm is an abnormal dilatation in the wall of blood vessels, due to a defect, disease, or injury. The true incidence of intracranial aneurysm is estimated at 1-6 % of the population, typically becoming symptomatic in people aged 40-60 years. Sacular aneurysms are rounded outpouching that arise from arterial bifurcation, most commonly in the circle of Willis. Aneurysms of the middle cerebral artery (MCA) account for 18-22 % of all aneurysms. **Materials and methods.** The authors describe a case of a 40 years old woman, without cardiovascular risk factors, smoking or alcohol habits, with history of headaches with 2 weeks of evolution that suddenly begins an acute confusional state. At admission she was lethargic, without verbal response, not localizing pain and with Babinski sign at right; GCS score of 9 and Hunt and Hess grade of 3. **Results.** Cerebral CT revealed insular hematoma in apparent continuity with subarachnoid hemorrhage filling the sylvian fissure. Cerebral CT angiography showed 2 aneurysms in the M1 (projected inferiorly) and M2 (projected superiorly) bifurcation. The patient was treated surgically to prevent the risk of repeated hemorrhage and vasospasm on the day after admission. The proximal aneurysm was clipped and the distal was wrapped. Postoperative cranial CT revealed sylvian hematoma without apparent rebleeding and basal ganglia infarction. Six months after surgery and rehabilitation she had no motor deficits and Broca aphasia. **Conclusion.** As reported in the literature this case suggests that critical care should be taken in the management of M1 artery aneurysms; thus, preventing surgical complications, such as vasospasm injury, which may result in neurologic deficits.

References

1. Jonathan L Brisman et al; Cerebral Aneurysm; www.emedicine.com; May 22, 2009.
2. Dong-Hyuk Park et al, Angiographic features, surgical management and outcomes of proximal middle cerebral artery aneurysms; Clinical Neurology and Neurosurgery; 2008; 110:544-551

Old and complete brachial plexus paralysis: what can we do?

M.J. Leite, P. Cantista

Service of PRM, Centro Hospitalar do Porto, Hospital Santo António, Porto, Portugal

Introduction. One of the most devastating injuries that a young man can sustain is an injury of the brachial plexus (BP) affecting the dominant arm. If the lesion is proximal to the ganglion, the roots will have been torn from the cord and the prognosis is hopeless for

nerve regeneration. The optimal timing for exploration and microsurgical reconstructive techniques remains controversial. Palliative surgery may be indicated in cases seen late or after failed attempts at nerve repair. **Materials and methods.** We present a case of a 42 years old male, victim of motorcycle accident in April of 2002 followed by immediate injury of the BP and installation of paralysis of the right upper extremity. **Results.** Nerve conduction studies and needle electromyography was compatible with complete injury of spinal nerve roots. Pseudomeningocele and spinal cord injury were excluded by CT scan with myelography. Exploration of the BP revealed avulsion of the roots from the cord and irreversibility of the lesions was documented. Seven years later the patient arrives to our follow-up survey with a flail limb, without pain, requesting an amputation. **Conclusion.** This request motivated us to perform a literature review on the current state of art for the management of flail limb following a complete posttraumatic brachial plexus injury.

References

1. A.O. Ransford et al; Complete brachial plexus lesions: a ten-year follow-up of twenty cases; J Bone Joint Surg Br;1977; 59-B:417-420.
2. M. Chammass et al; Glenohumeral arthrodesis in upper and total brachial plexus palsy; J Bone Joint Surg Br;2004; 86-B:692-5.
3. De Jager LT et al; The functional benefits of reconstructive surgery for complete lesions of the brachial plexus in adults; J Hand Surg Br;2002;27(4):342-4.
4. Gousheh J et al; Upper limb functional restoration in old and complete brachial plexus paralysis; J Hand Surg Eur;2010; 35(1):16-22.

Clinical Dysphagia Examination with Cervical Auscultation in a Rehabilitation Medicine Unit

S. Faletti¹, G. Santus¹, F. Pirali²

¹U.O. Medicina Riabilitativa, Ospedale S. Orsola Fondazione Poliambulanza Brescia

²Servizio Epidemiologico, Ospedale di Cremona

Introduction. The clinical evaluation of dysphagia is usually carried out by a Bedside Swallowing Examination (BSE). But a significant proportion of dysphagic patients may aspirate silently. The controversial method of cervical auscultation (CA) can be useful to evaluate the aspiration risk¹. Our goal was to determine the clinical impact of the CA used together with BSE in order to distinguish between subjects who aspirate and those who don't in comparison to the gold standard videofluoroscopy (VFSS). **Materials and methods.** The study involved 200 patients (59% female, average age 74 years), affected by post-acute or chronic neurologic pathologies. We submitted patients to a BSE, including the examination of cranial nerves, oral motility, laryngeal elevation, voluntary cough and swallowing tests with different consistencies. Simultaneously we adopted the CA: a stethoscope put on the cervical lateral region to listen to swallowing and respiratory sounds. In 20 cases we applied also a VFSS. **Results.** Using BSE and CA we found 95 dysphagic patients (47,5 %), classified in compliance with Prosiegl scale: 32% at the 1st or 2nd score, 52% at 3rd, and 1,2% from 4th to 6th. We could compare statistically the clinical signs with the evidence of aspiration or penetration of different boluses in 20 VFSS. Post-swallowing dump sounds detected by CA were found significantly related to the aspiration of a liquid bolus (p=0,02), of a semi-liquid bolus (p=0,02) and to the penetration of a semi-liquid bolus (p=0,02). It was assessed an important correlation between laryngeal elevation deficits and oral post-swallowing residuals detected by BSE and the aspiration. The auscultation of multiple swallowings per bolus aren't significantly related with aspiration. **Conclusion.** The clinical evaluation of swallowing sounds with CA gives useful judgements beyond BSE to better define aspiration risks. CA can be useful in patients without a valid cough-reflex and in those who do not cooperate. It can be repeated easily during the clinical course.

References

1. Borr C. Reliability and validity of cervical auscultation. Dysphagia, 2007; 22:225-234

Post-stroke depression a further study on motor and functional recovery

B. Lombardi, G. Briganti, M.Paci, L. Nannetti, P. D'Ippolito, V. Santoro
Rehabilitation Ward Misericordia & Dolce Hospital Prato

Introduction. Depression is common after stroke and there are several studies on the relationship between mood disorders and stroke. Correlation between post-stroke depression (PSD) and func-

tional outcome has been shown, but the impact on functional and motor recovery hasn't been often investigated. In our previous observation we underlined that PSD patients were unable to bring acquired motor abilities into functional activity (1). This study follows the previous and evaluates the influence of PSD on motor and functional outcome. **Materials and methods.** 194 consecutive patients, were selected and admitted for stroke in our intensive rehabilitation ward between January 2003 and December 2007. According to exclusion criteria were enrolled 119 subjects, 8 patients dropped out. 111 subjects with ischemic stroke were divided into two groups according to the presence of PSD (PSD+ 81 and PSD-30). Screening measures were DSM-IV criteria, the Geriatric Depression Scale. Outcomes were evaluated on the basis of Barthel Index (BI) and Fugl-Meyer Assessment Scale (FMA). Measurements were performed at admission to the ward (T1), discharge (T2) and follow-up (T3) 3 months from stroke. **Results.** Both groups showed a significant improvement in all outcome measures. Improvement differences were not significant on FMA scores in either group at each assessment; the PSD group had a significant higher improvement on BI score at follow-up. According to the logistic model, from T2 to T3 PSD is the only significant factor related to functional recovery. **Conclusion.** PSD is not an influencing factor for motor recovery. Results show a negative impact of PSD on the functional recovery process after discharge and not during hospitalisation. Discharge is a critical step for management of PSD. In this study we confirm the results obtained in our previous observation on 117 patient evaluated from 1999 to 2002

References

L. Nannetti, M. Paci, J. Pasquini, B.Lombardi, P.G. Taiti Motor and functional recovery in patients with post -stroke depression Disability and Rehabilitation 2005;27(4):170

Chronic low back pain in the elderly: gender differences

A. Vukomanovic, J. Arsic, V. Pejovic, G. Lukovic, S. Anicic, P. Pisev
Clinic for PRM, Military Medical Academy, Belgrade, Serbia

Introduction. Chronic low back pain (CLBP) is one of the most common causes for utilizing medical rehabilitation services. Little is known about gender differences in some physical and psychological characteristics of the elderly patients with CLBP. The aim of this study was to analyze pain, mobility, functional disability, satisfaction of life and depression mood of the patients of both sexes with CLBP older than 60 and to compare results between men and women. **Materials and methods.** This study included 71 patients older than 60 who underwent physical therapy and medical rehabilitation in the authors' institution because of CLBP. Measurements and tests: reported pain in rest and pain while moving (Visual Analog Scale), mobility (Timed Up and Go Test), activities of daily living (The Oswestry Low Back Disability Questionnaire), mood (The Life Satisfaction Index and The Zung Self Rating Depression Scale). Data analysis: Student's T test. **Results.** 33 women and 38 men, no differences in age distribution and duration of the symptoms. Women reported more severe pain in rest (36±24;32(0-75)vs22±20;18(0-75),p<0.05) and while moving (55±18;52(9-100)vs33±25;33(0-100),p<0.001) than men. Also, women moved more slowly while performing mobility test (17±4;17(11-22)vs13±4;12(9-22),p<0.001) and reported more severe functional disability than men (34±12;33(11-51)vs21±13;21(0-51),p<0.001). There is no difference in life satisfaction between men and women, but women were in more depressive mood than men (42±7;42(31-51)vs37±8;35.5(23-51),p<0.001). **Conclusion.** These results suggest that there are some physical and psychological differences between elderly women and men with CLBP who underwent physical therapy.

References

Wijnhoven HAH, de Vet HCW, Picavet HSJ. Sex differences in consequences of musculoskeletal pain. Spine 2007;32:1360-7.
Leveille SG, Zhang Y, McMullen W, Kelly-Hayes M, Felson DT. Sex differences in musculoskeletal pain in older adults. Pain 2005;116:332-8.

The 6-min walking test after cardiac bypass surgery and early rehabilitation

V. Pejovic, Z. Brdareski, A. Vukomanovic, A. Djurovic, P. Pisev, S. Anicic
Clinic for PRM, Military Medical Academy, Belgrade, Serbia

Introduction. 6-min walking test (6MWT) is a simple test which can be used to assess functional condition of patients after cardiac by pass surgery rehabilitation. Aim of our study was to compare

functional recovery of patients after coronary artery bypass with and without history of myocardial infarction before surgery. **Materials and methods.** Prospective nonrandom clinical study included 32 patients (31 men, 1 woman) after cardiac bypass surgery. 12 patients had heart attack (7 less, 5 more than a year before bypass surgery). All patients had cardiac rehabilitation level load of 3 MET, during 6,4±1,14 days and before discharge were tested by 6MWT. We matched the walked distance by patients with infarction and without infarction and walked distance in attitude of the time between infarction and bypass surgery (less or more than a year before bypass surgery). Data was statistically processed with Fisher Exact Test, Mann Whitney Exact Test, average value ±SD;p<0,05. **Results.** The distance walked by patients with infarction was 277±59,56m, without infarction 286±74,43m. The distance in patients with infarction less than a year was 279,4±76,96m and more than a year was 274,6±29,25m. There was not statistically significant different of the walked distance in both group. Average left ventricular ejection fraction: group with infarction 52,64±5,16% and group without infarction 53,42±4,95%. **Conclusion.** These results could be explained by a low level of exercise load and relative good left ventricular ejection fraction of all patients. Myocardial infarction before surgery and time between infarction and bypass surgery, in our group of patients, did not influence the functional recovery. Our data suggest that 6MWT is well tolerated but not sensitive for these patients.

References

Gayda M, Temfemo A, Choquet D, Ahmadi S. Cardiorespiratory requirements and reproducibility of the six-minute walk test in elderly patients with coronary artery disease. Arch Phys Med Rehabil 2004; 85:1538-43.

The early rehabilitation of patients after transplantation of liver

P. Pisev, V. Pejović, A. Vukomanović, A. Durović, Z. Brdareski
Clinic for PRM Military Medical Academy, Belgrade, Serbia

Introduction. Transplantation of the liver provides patients with hard liver's insufficiency not only longer life, but also better conditions for improvement of its quality, and quality of life is achieved through the process of rehabilitation. Our aim was to present our experience and achieved results of early rehabilitation at patients after transplantation of the liver. **Materials and methods.** 5 patients (3 women, 2 men) with different pre-operative etiology. They had identical exercise treatment twice a day, lasting from 15-30 minutes (exercises, gradual mobilizations from sitting till the level of walk on the flat floor, walk-up and downstairs and bicycle-ergometer). Measurement: functional test for daily activities (FIM) and manual muscular test (MMT). Data presentation: average value ±SD; min-max. **Results.** Average age 40,4±15,56;20-59 years. Rehabilitation began 2,8±1,3;1-4 of the post- operative day; and it lasted 43±7,84;34-50 days. FIM at the beginning of treatment amounted to 33,6±15,64;18-54, and at the end of rehabilitation 120,2±8,32;108-126. The rough muscular strength estimated by MMT increased at the end of rehabilitation by 1-1,5 evaluation (beginning 2/3, end 4/5). At the end of the early rehabilitation the patients were totally capable for daily life activities. During the rehabilitation significant complications was effusion of pleura at all patients, effusion of peritoneum and encephalopathy at 3 patients and vein thrombosis at one patient. **Conclusion.** It was noticed that the course of rehabilitation and result of rehabilitation depended to a great extent from disease's etiology and pre-operative functional state of the patient. Early rehabilitation after the liver's transplantation provided early mobilization of the patients and achievement of satisfactory quality of life. Complications during the rehabilitation did not disturb its course to a great extent.

References

Epstein SK, Freeman RB, Khayat A, Unterborn JN, Pratt DS, Kaplan MM. Aerobic capacity is associated with 100-day outcome after hepatic transplantation. Liver Transplantation 2004;10:418-24.

Nutritional status (NS) in neurologic disorders.

I. Avdyunina, V. Alferova, L. Chernikova, V. Ionova, A. Shabalina, M. Kostureva
Scientific Center of Neurology, Moscow, RU.

Introduction. Analysis of prevalence and nature of NS changes and its influence on the course of different neurologic diseases was the object of our investigation. **Materials and methods.** 363 patients

with different neurologic diseases (at the age 14-89 years) were investigated. 6.9% patients scored 3-8; 7.4% - 9-10; 85.7% - 11-15 in Glasgow coma scale. 117 patients were operated. We used clinical and neurological investigation, anthropometry, laboratory parameters monitoring. **Results.** In 1/3 of patient's overweight/obesity was registered. Protein-energy malnutrition (PEM: 7.9% severe, 29.3% moderate, 62.8% mild) was found in 59.2% cases. PEM was diagnosed more often: in old patients; in stroke, in neuromuscular diseases; in severe state; in endocrine and renal diseases and pathology of gastrointestinal tract. Kwashiorkor-like malnutrition was revealed in 69.3% cases; marasmic wasting – in 14.9%, and in 15.8% we saw combination of both. The disturbance of water-electrolyte balance was detected in 67.2% of patients: dehydration; potassium, iron and zinc deficit prevailed. Among patients with 11-15 score PEM was noticed in 54% and dehydration – in 53.7%, after neurosurgery – in 47% and in 65% cases, accordingly. In PEM cases pulmonary complications were noticed in 2.3 times more frequently, while respiratory insufficiency – in 5.4 times; sepsis, bedsores and festers were only with PEM. Correlation index between PEM and outcome of neurologic disease was 0.43 (P=0.0000). Dysphagia is the most significant of all neurologic features influencing on NS (unconsciousness, immobility, hyper motility, dysphasia, vision disturbance, etc.). **Conclusion.** NS disturbance is widely spread among patients with neurologic disorders and is one of the basic pathogenic factors of critical state. Neurologic features influencing on NS should be kept in mind during nutritional therapy.

A Survey of patients with lower limb amputation referred to IRCS comprehensive rehabilitation center (March 2008 to December 2009)

A. Raeissadat, S. Alavi, P. Mozhgani, A. Eshraghi
 ?????

Introduction. Amputation is considered to be one of the most important grounds of teamwork in rehabilitation teams. Comprehensive rehabilitation center of IRCS established an amputee clinic in order to give comprehensive services to amputees. The purpose of this study was to analyze data of patients with lower limb amputation referred to IRCS comprehensive rehabilitation center from March 2008 to December 2009. **Materials and methods.** This descriptive, cross-sectional study was conducted on all of the patients with lower limb amputation, who were referred to the center' amputee clinic for first prosthesis fabrication. Information about functional status, referral date, stump status, general health, etiology, etc. was collected by an examination team (physiatrist, prosthetist, occupational and physical therapist and social worker) using a researcher-made questionnaire. **Results.** In total, 380 patients were studied, with average age of 47.67 ± 25.65. Male to female ratio was 4 to 1 and average time period between amputation surgery and referral for the first prosthesis was 13.5 ± 2.53 months. Amputation side in 45.2% of patients was right, in 47.4% left and the rest were bilateral amputees. Level of amputation frequencies were as follows: 3.5% syme, 66.9% below-knee, 5.5% knee disarticulation, 22% above-knee, 2.1% hip disarticulation. Amputation causes included: 50.2% vascular problems, 33.2% trauma, 8.1% tumor, 3.7% congenital and 5.1% other. Functional status of patients before prosthesis delivery was as follows: 35.2% ambulated with crutch, 15.2% used walker, 46.7% moved with wheelchair and 1.9% dragged themselves on ground. One percent of patients could not move independently. Of all patients, 40.9% were referred to occupational therapy department for ADL training with prosthesis and 56.7% were referred to physical therapy department for muscular strengthening, pain relief, etc. before prosthesis fabrication. Rehabilitation team examinations on stump status showed 10.9% edema, 8.7% scar, 5.1% muscular atrophy, 14.2% proximal joint contracture, 6.6% wound, and 12.7% phantom pain or sense. There was significant statistical relationship between average time period from amputation surgery to referral for the first prosthesis and stump status (p < 0.05). **Conclusion.** It might be concluded that, functional problems before prosthesis delivery, resultant poor quality of life and high prevalence of stump complication among amputees necessitate early referral and timely comprehensive rehabilitation services.

Fatigue as experienced by rheumatoid arthritis patients. A cohort of 44 tunisian cases

H. Migaw, A. Jellad, S. Boudoukhane, Laajili H, Z. Ben Salah Frih
 Departement of Rehabilitation, Monastir Teaching Hospital, Monastir, Tunisia

Introduction. Interest in fatigue research has grown since the finding that fatigue is, besides pain, the symptom most frequently reported by patients with rheumatoid arthritis (RA). The aim of this study was to explore the experience of fatigue in Tunisian RA patients. **Materials and methods.** Forty-four RA outpatients, responding to ACR criteria, filled-out written questionnaires on fatigue severity, disability and quality of life. All patients were individually interviewed and asked about fatigue. Measures were as follows: Multidimensional Assessment of Fatigue (MAF), Fatigue Visual Analog Scale (VAS), Swollen joint count, Tender joint count (Ritchie index), Quality of life (SF36), Hospital Anxiety and Depression Scale (HAD). **Results.** Participants were 39 women and 5 men (mean age= 47, range 24-78 years). Mean disease duration was 12 years (range 1-35 years). Evaluation of RA activity noted a mean Ritchie articular index about 27.6 (range 0-78). The mean parameters measured were: 60 (range 10-100) for fatigue VAS, 74.5 (range 1-119) for MAF, 7.9/21 (range 0-14) for anxiety HAD, 8.4/21 (range 0-17) for depression HAD, 35.3 (range 21-48) for SF36 PCS and 40.7 (range 28-54) for SF36 MCS. RA fatigue was verbalised as a physical everyday experience (97%), as psychological (60%) and as mental (18%) with a variety in duration and intensity. Patients mentioned having RA as the main cause of their fatigue which gave rise to a reduction in daily activities. Patients described how they had to find their own management strategies by rest (72.7%) and planning activities (13.6%). **Conclusion.** The results of this study show that fatigue is an unpredictable, almost daily experience for RA patients with a great impact on the quality of life, while patients struggle alone to manage it. These results will help professionals caring for RA patients to communicate about fatigue, to explore the nature of fatigue individually and to develop tailored interventions.

References

Hewlett, S., Cockshott, Z., Byron, M., Kitchen, K., Tipler, S., Pope, D., Hehir, M., 2005. Patients' perceptions of fatigue in rheumatoid arthritis: overwhelming, uncontrollable, ignored. *Arthritis and Rheumatism* 53 (5), 697-702.
 Pollard, L.C., Choy, E.H., Gonzalez, J., Khoshaba, B., Scott, D.L., 2006. Fatigue in rheumatoid arthritis reflects pain, not disease activity. *Rheumatology (Oxford)* 45 (7), 885-889.

Health-Related Quality of life in Rheumatoid Arthritis: a Tunisian cohort

Z. Ben Salah Frih, H. Migaw, A. Jellad, S. Boudoukhane, H. Laajili
 Departement of Rehabilitation, Monastir Teaching Hospital, Monastir, Tunisia

Introduction. Rheumatoid arthritis (RA) is a systemic chronic inflammatory disease. Because of its chronic, painful, and disabling character, RA tends to have a profound impact of health-related quality of life. The aim of this study was to evaluate the quality of life in a Tunisian cohort of RA patients. **Materials and methods.** 63 consecutive patients, responding to ACR criteria, were recruited from the departments of rheumatology and rehabilitation of Monastir Teaching Hospital. We evaluated the activity of disease by the Disease Activity Score (DAS 28), fatigue by the Multidimensional Assessment of Fatigue (MAF), psychological impact by the Hospital Anxiety and depression Scale (HAD), functional tiredness (MAF) and the quality of life is assessed using Health Assessment Questionnaire (HAQ) and the Short Form 36 questionnaire (SF36). **Results.** The average duration of disease evolution was 11.73 years (range : 0.5-35 years). Analysis of disease activity has noted : an average DAS 28 value of 4.96 (range :1,89-7,32), 6patients (9,5%) were in remission, 32 with a disease activity considered low or moderate and 25 (39,7%) with a disease very active. The average of SF36 was 35,9% for physical component (PCS) and 41,4% for mental component (MCS). A significant correlation was found between the score of the SF36 (PCS, MCS) and the following parameters: age, disease, duration, activity of disease, HAQ, MAF and HAD. **Conclusion.** The RA is among pathologies which aroused the most interest in the field of the evaluation of the quality of life in rheumatology. The consequences of PR are not limited to the physical field of health and measurements of quality of life show well the importance and the precocity of the deterioration of operations psychological and social due to the disease.

References

B. Krola, R. Sanderman. Social Support, Rheumatoid Arthritis and Quality of Life: Concepts, Measurement and Research. *Patient Education and Counseling*, 1993,20:101-120.
 R. Jump, J. Fifeild, H.Tennen. History of Affective Disorder and the Experience of Fatigue in Rheumatoid Arthritis. *Arthritis & Rheumatism (Arthritis Care & Research)* 2004,51:239-245.

Fatigue-correlated factors in rheumatoid arthritis

H. Migaw, S. Boudoukhane, A. Jellad, H. Laajili, Z. Ben Salah Frih
Departement of Rehabilitation, Monastir Teaching Hospital, Monastir, Tunisia

Introduction. Although pain is the most common and frequently studied feature of rheumatoid arthritis (RA), fatigue is a significant source of distress and disability for many RA patients. The aim of this study was to determine the relationship between fatigue and clinical as well as functional parameters in persons with RA. **Materials and methods.** Forty-four consecutive RA outpatients were recruited from the departments of Rheumatology and Rehabilitation of Monastir Teaching Hospital. Fatigue is assessed by Multidimensional Assessment of Fatigue (MAF), fatigue visual analog scale (VAS), and RA activity by number of swollen joints, Ritchie articular index. Psychological impact is evaluated by Hospital Anxiety and Depression Scale (HAD) and the quality of life is assessed by Health Assessment Questionnaire (HAQ) and SF36. Correlation was evaluated by spearman index. **Results.** Participants were 39 women and 5 men (mean age= 47, range 24-78 years), 64, 5% of patients were unable to exercise any professional activity. Mean disease duration was 12 years (range 1-35 years). The mean fatigue VAS was 60 (range 10-100) and 74.5 (range 1-119) for MAF. A correlation is noted with parameters assessed: age (r: 0,385, p<0, 01), disease duration (r: 0,483, p<0,001), fatigue VAS (r: 0,759, p<0,001), Ritchie articular index (r: 0,597, p<0,001), HAQ (r: 0,781, p<0,001), HAD (r: 0,497, p<0,001), SF36 for physical (r: 0,833, p<0,001) and mental component (r: 0,566, p<0,001). **Conclusion.** Fatigue is increasingly recognized as an important factor contributing to quality of life in RA patients and is correlated with disease duration, pain, decrease in function status and psychological symptoms. Persistent fatigue is one of the biggest obstacles to optimize function in these patients.

References

- Crosby, L.J., 1991. Factors which contribute to fatigue associated with rheumatoid arthritis. *Journal of Advanced Nursing* 16 (8), 974-981.
 Pollard, L.C., Choy, E.H., Gonzalez, J., Khoshaba, B., Scott, D.L. 2006. Fatigue in rheumatoid arthritis reflects pain, not disease activity. *Rheumatology (Oxford)* 45 (7), 885-889.

Diagnosis and cranial osteopathic treatment of torticollis and positional plagiocephaly in pediatric age

V. Savoia, S. Boscarino, P. La Viola, E. Pacciani, E. Castelli
Pediatric Hospital Bambino Gesù, Palidoro (Rome), Italy.

Introduction. The purpose of this study is to assess the therapeutic efficacy of osteopathic treatment in newborns and infants with postural asymmetry. Asymmetry in infancy is a diagnosis with a large spectrum of features, expressing an abnormal shape of the body or unequal postures and movements, which might be structural and/or functional, with localized or generalized expression. (1) Cervical rotation deficit (CRD) and trunk convexity (TC) constitute the diagnosis of IPA (infantile postural asymmetry). **Materials and methods.** Through medical and osteopathic integrated neonatal examination it's possible to identify individuals predisposed to develop posterior plagiocephaly, sometimes associated with torticollis (2), thereby providing for the earliest possible intervention with cranial osteopathic techniques. Between 2005 and 2009 we have selected randomly 50 infants in the 1-12 months age range when first examined. Medical records were reviewed for patient demographics, pregnancy, birth and maternal history (stuck baby, delivery details, use of forceps, vacuum or Caesarean), feeding modes, associated symptoms and cranial or facial asymmetries. (3) Patients in the first year of life underwent osteopathic treatment. **Results.** Although our experience is actually limited, osteopathic treatment could be considered a potential support because of the encouraging positive results obtained. **Conclusion.** Although a larger study is needed, according to our experience it appears that osteopathic treatment offers a potential benefit as it's a non-invasive preventive therapy that improves the degree of asymmetry in newborns and infants with torticollis and positional plagiocephaly.

References

1. van Vlimmeren LA, Helders PJ, van Adrichem LN, Engelbert RH, "Torticollis and plagiocephaly in infancy: therapeutic strategies." *Pediatr Rehabil.* 2006; 9(1):40-46.
 2. Stellwagen L, Hubbard E, Chambers C, Jones KL, "Torticollis, facial asymmetry and plagiocephaly in normal newborns." *Arch Dis Child.* 2008; 93:827-831.
 3. Sergueef N, Nelson KE, Glonek T, "Palpatory diagnosis of plagiocephaly." *Complement Ther Clin Pract* 2006 May; 12(2):101-110.

The effect of Monochromatic Infrared Energy in pain and wound healing

M.J. Azevedo, F. Ramada, L. Sá, A. Castro, I. Ruvina.
Centro Hospitalar do Alto Ave, Guimarães, Portugal

Introduction. Venous and arterial ulcers are difficult to manage and often do not heal, even with aggressive medical treatment.^{1,2} Monochromatic Infrared Energy (MIRE) increases nitric oxid, which has effect in wound repair, skeletal muscle injury and pain². The purpose of this study is to determine the effect of 890 nanometer MIRE on pain and wound healing in patients with venous and arterial ulcers that failed to repair with conservative treatment. **Materials and methods.** Patients maintained previous conventional treatment and underwent once or twice daily MIRE therapy, 5 times a week for 1 month. Patients were observed before, during and 1 month after treatment. Pain (Visual Analog Scale - VAS), and multiple wound characteristics were assessed, with pictures being taken at each session. **Results.** Seven patients entered the study (5 females), with an age average of 71 years. Four patients had venous ulcers, and 3 of them had arterial ulcers, with a mean evolution of 2 years. There was a general improvement in wound characteristics. The greatest effect was noted in a patient whose ulcer reduced from 17x7cm to 13,5x4,5cm. Mean size reduction is 0,94x0,73cm. There was an average wound depth reduction of 0,2cm. One month after treatment one patient still improved his wound while others maintained the results. An average of 2 point reduction in VAS was noted. **Conclusion.** MIRE therapy is a noninvasive, drug-free method for potentially healing chronic wounds resistant to conventional modalities. Use of MIRE on the subjects described contributed to decreased pain and enhanced healing of their ulcers. Additional research is needed with wider populations and longer periods of treatment.

References

1. Nather A. et al, Anodyne therapy for recalcitrant diabetic foot ulcers: a report of four cases, *Journal of Orthopedic Surgery* 2007; 15(3):361-4.
 2. Ortwitz LR. et al, Augmentation of wound healing using monochromatic infrared energy, *Advances in wound care* 1999; 12(1):35-40.

The relationship between TMS evoked motor potentials and clinical status in chronic stroke

Engin Cakar¹, Ilker Yagci², Evrim Karadag-Saygi², Hilmi Kilac¹, Osman Hakan Gunduz², Mehmet Zeki Kiralp¹, Gulseren Akyuz²

¹GATA Haydarpasa Training Hospital, Department of PMR

²Marmara University, School of Medicine, Department of PMR

Introduction. The aim of this study was to investigate the relationships between the TMS evoked electrophysiological parameters and clinical status. **Materials and methods.** A total of 22 post-stroke chronic hemiplegic patients were recruited. Barthel index, Brunnstrom motor staging, Ashworth spasticity scale, finger tapping for the clinical assessment and motor evoked potential (MEP) latency, MEP amplitude, resting motor threshold (rMT), central motor conduction time (CMCT) for the electrophysiological assessment were used. Electrophysiological parameters were measured for both of the hemispheres. TMS was performed with using MagVenture MagPro X100 with option, and MMC 140 parabolic coil and records were made from ADM muscle with surface electrodes. The statistical analysis was performed with descriptive statistics and Spearman correlation test. **Results.** The demographic characteristics of patients were as follows; mean age 63,86±9,35 years, mean post-stroke duration 17,18±6,59 months, 13 male and 9 female, affected hemisphere left side on 14, right side on 8 patients. There were no significant correlation between the Barthel index scores and any of the TMS parameters (p>0.05). It was found that Brunnstrom hand motor stage and finger tapping performance have positive correlation with MEP amplitude (p<0.001) and have negative correlation with MEP latency, rMT and CMCT (p<0.05). Ashworth hand spasticity score have negative correlation with MEP amplitude (p=0.001) and have positive correlation with CMCT (p=0,03). **Conclusion.** TMS evoked electrophysiological parameters have good correlations with some clinical assessment methods, but not with Barthel index. It was also remarkable that spasticity had significant correlation with MEP amplitudes. These correlations suggest that TMS might be a good option for the objective documentation of clinical status and for the follow-up of the hemiplegic patients. Also these correlations might serve as a data for explanation of pathophysiological mechanisms which underlie the post-stroke disability.

Patient's experience of parenteral Ketamine injections in chronic non-malignant pain

Bengt H Sjölund, Marcus Andersson

Rehabilitation and Research Centre for Torture Victims, Copenhagen, University of Southern Denmark, Odense, Denmark and Section of Rehabilitation Medicine, Umeå University, Sweden.

Introduction. Chronic non-malignant pain is a common sensory impairment in PRM practice. It is often difficult to isolate the peripheral source of pain. Changes in the sensory nervous system, such as an increased sensitivity to stimuli via synaptic modification, may be responsible. Following the observation that Ketamine, an anesthetic and a NMDA receptor antagonist, inhibits secondary hyperalgesia and the 'wind-up' phenomenon in man, some pain management anesthesiologists in Sweden have administered repeated injections of 10–20 mg Ketamine iv in patients with intractable pain. We have sent a questionnaire to such patients to explore their experiences. **Materials and methods.** The names of 20 patients with chronic non-malignant pain, having received treatment with Ketamine injections at Skellefteå hospital, were given to us by the person in charge. They were sent a questionnaire on demography; number of years with pain; diagnosis; occupational situation; other pain treatments; number of Ketamine injections; pain intensity (VAS) before and after injection; duration of pain relief; effects of the treatment on daily life. Two reminders were used. **Results.** 16 patients responded (mean age 45 years). Present pain duration was 6,9 (range 2–25) years. The pain was neuropathic in 10 cases, nociceptive in 4 and unknown in 2. Pain intensity before treatment ranged from 42–100 mm (mean 73 mm). Twelve patients had received more than six injections, the rest less. In average, 15 patients indicated a decrease of pain intensity by 43 mm after treatment. One patient had no effect at all. The duration of pain relief varied from 0 to 104 (median 12) weeks. Most patients indicated that they were more active and experienced an increased quality of life after treatment. **Conclusion.** In a selected group of patients with intractable chronic nonmalignant pain, repeated iv injections of 10–20 mg Ketamine, may be a relevant novel pain therapy. Controlled studies are warranted.

Neurological rehabilitation technique for spasticity in patient with multiple sclerosis. A case report.

L. Lombardi^{1,2}, A. Ravaschio^{1,2}, M. Migliorini^{1,3}, V. Belloni^{1,2}, F. Galluzzi¹

¹ASL 2 Lucca

²Università Di Firenze

³Master in Riabilitazione dei Disordini Muscolo-Scheletrici - Università di Genova

Introduction. Spasticity is a characteristic and early component of pyramidal tract lesions in Multiple Sclerosis; in the less severe forms, it may be limited to the involvement of only one lower limb. One of the most used treatments is botox inoculation. The aim of this paper is to evaluate the efficacy of a Sudden Passive Muscle Shortening SPMS (Grimaldi's method) in reducing S.M. Spasticity. **Material and methods.** BRM, a 58 year old female suffering from S.M. and lower limb spasticity, underwent clinical and gait analysis evaluation (T0); then she was treated with SPMS (7 week); the evaluation was repeated at the end of treatment (T1) and after one month (T2) in order to assess the efficacy of the treatment and its duration over time. **Results.** At the end of the treatment, clinical and gait analysis evaluation revealed that the spasticity was reduced and that the ability of walking was increased; the effects of the treatment were still present after one month. **Conclusion.** A rehabilitative treatment can have the same efficacy as botox inoculation in reducing spasticity. The opportunity to use this approach is discussed, even if it is necessary to evaluate the treatment persistence over longer periods.

References

- Crippa A., Cardini R., Pellegatta D., Manzoni S. Cattaneo D., and Magazzini F. Neurorehabilitation and Neural Repair 2004; 18: 47-52
Feldman AG, Levin FM. Behav Brain Sci 1995; 18: 723-806

Combining transcranial direct current stimulation and functional task training for upper extremity motor recovery in a 19 year-old stroke survivor. A case report

S. Straudi¹, E. Chew², I. Cajigas³, F. Fregni³, P. Bonato³

¹Department of Physical Medicine & Rehabilitation, S.Giorgio Hospital, Ferrara, Italy

²University Medicine Cluster, National University Hospital, Singapore

³Department of Physical Medicine & Rehabilitation, Spaulding Rehabilitation Hospital, Harvard Medical School, Boston, MA

Introduction. Stroke can cause disabling hemiparesis in developing age and clinically meaningful motor recovery in the chronic phase is rare. Transcranial direct current (tDCS) is a noninvasive method of brain stimulation that uses direct current to modulate cortical plasticity [1]. We hypothesize that tDCS would be beneficial if combined with repetitive, task-specific practice of the affected upper extremity in a 19 year old boy with no meaningful use of the right arm due to middle cerebral artery infarct when 12 years old. **Materials and methods.** The subject underwent 40 minutes of 1mA anodal tDCS to the M1 cortex contralateral to the affected arm concurrently with repetitive, multidirectional grasp and release activities in a gravity-supported, computer-enhanced upper extremity training. He underwent 10 training sessions over 2 weeks. Outcomes measured were: 1) the Jebsen-Taylor Hand Function Test (JTHFT); 2) Box and Block Test (BBT); 3) the Fugl-Meyer Assessment for upper extremity (FMA); 4) Motor Activity Log (MAL). Mean and maximum reaching speed, minimum jerk (smoothness) were registered. Memory span and Patient Health Questionnaire-9 was monitored. **Results.** The subject tolerated the brain stimulation well. JTHFT improved post-treatment from 81s to 75s and 65s at 2-weeks follow-up. FMA score improved after treatment from 39 to 47 and 50 at 2-weeks. The MAL score improved after treatment from 2.1 to 2.8 and was sustained (2.7). There were no effects on mood or working memory. Mean reaching speed improved from 3.01cm/s to 4.42cm/s and maximum speed improved from 7.42cm/s to 14.98cm/s. Smoothness was improved from -473.66cm/s³ to -1232cm/s³. **Conclusion.** tDCS is safe and well-tolerated in a 19-year-old subject with hemiparesis and it could be a promising technique for enhancing motor recovery when combined with rehabilitation.

References

1. Hummel F et al. Effects of non-invasive cortical stimulation on skilled motor function in chronic stroke. Brain 2005;128:490-9.

The effects of robot-assisted gait training on spatiotemporal gait parameters and locomotor function in subjects with multiple sclerosis

S. Ursino^{1,2}, E. Venturini², L. Balugani², C. Pampolini², S. Cavazza², S. Straudi², N. Basaglia²

¹Ospedale Riabilitativo di Alta Specializzazione Spa di Motta di Livenza (TV), Italy

²Unità Operativa di Medicina Riabilitativa, Dipartimento di Neuroscienze, Azienda Ospedaliero-Universitaria di Ferrara, Italy

Introduction. Gait disabilities are very common in multiple sclerosis with a negative impact on personal activities and quality of life. It has been shown that human brain is capable of significant modification providing that the quantity (duration and frequency) and quality (task specificity) of rehabilitative interventions are appropriate to facilitate neuroplasticity and motor learning [1]. The aims of this study is to test the effects of robot-assisted gait training in mid-functioning multiple sclerosis subjects on spatiotemporal gait parameters and locomotor function. **Materials and methods.** Eleven subjects has been recruited. The inclusion criteria were: no relapse during the last six months, gait impairments defined as Expanded Disability Status Scale from 4.5 to 6.5. Exclusion criteria were: neurologic conditions in addition to multiple sclerosis that may affect motor function, impaired cognitive functioning, severe spasticity or contractures that may limit range of motion. Participants received 12 robot-assisted gait training sessions over 6 weeks (2 sessions/week). Primary outcomes measure were spatiotemporal gait parameters (VICON motion analysis). Secondary outcome measures included clinical test of walking endurance (six-minute walk test), balance (Berg Balance Test) and mobility (Up and Go Test). Self-reported questionnaire on motor fatigue (Fatigue Severity Scale), depression (PHQ-9) and quality of life (SF-36) were submitted. Outcome measures were assessed pre- and post-training. **Results.** Spatiotemporal gait parameters showed an overall improvement after training: walking speed (p=0,002), cadence (p=0,027), double support (p=0,01) and step length (p=0,016). Walking endurance (p=0,012) was improved, motor fatigue was decreased (p=0,036). Subjects also reported a better mood (p=0,017) and a better quality of life perception (p=0,05). **Conclusion.** Robot-assisted gait training seems to be effective in restoring walking competency in mid-functioning multiple sclerosis subjects.

References

1. Pelletier J, Audoin B, Reuter F, Ranjeva JP : Plasticity in MS : from functional imaging to rehabilitation. Int MS J 2009 ;16(1) :26-31.

Clinical and statistical considerations on the rehabilitation assessment in FAO by means of stroke evaluation minimal protocol (SEMP)

M. D'Andrea¹, L. Leo³, D. De Buono², T. Catanzaro⁴, L. Fratto¹, E. Fata¹, S. Catanzaro¹, G.A.M. Amendola¹, R. Ciambrone², M. Iocco¹
¹PM&R Department, "Magna Græcia", University, Catanzaro (IT)
²"M. Misasi" Hospital, Rehabilitation Unit, Cosenza (IT)
³"SS. Annunziata" Regional Hospital, Rehabilitation Unit, Cosenza (IT)
⁴"S. Giovanni di Dio" ASP Hospital, Crotone (IT)

Introduction. This communication reports data obtained from patients evaluated for stroke (SEMP) in emergency units (March 2007 - February 2010). **Materials and methods.** 581 patients admitted to the units of Neurology, Internal Medicine, Neurosurgery and Geriatrics (Catanzaro, Cosenza and Crotone Hospitals) were evaluated few days after an episode of stroke (average: three days). Statistical analysis of the data was performed. **Results.** Ischemic stroke (IS) was demonstrated in 481 (241 men, 239 women, m.a. 72.36 years) out of the 581 patients. Hemorrhagic stroke (HS) was recognized in the remaining 100 patients. Statistical evaluation will be provided, including age and dominance. The percent of relapse was 10.81% and 15% in IS and HS respectively. Distribution of poly-pathology in stroke was 85.45 % (IS) and 90% (HS). Dysphagia (16.15%) in all the subjects, USN was more represented in IS (10, 39%) then in HS (2%). CNS, TCT and FAC data will be reported. Data of pre and poststroke Rankin show a general condition of severe disability. **Conclusion.** Results are in agreement with the literature with an exception for sex distribution, since FAO reports higher frequency of stroke among women. Our data collection represents a useful starting point for planning network rehabilitation route in Calabria.

References (Short)

1. SPREAD IV edizione: linee guida italiane di prevenzione e trattamento dell'ictus cerebrale. Stesura del 15 marzo 2005.
2. Lenti G., Agosti M., Massucci M., Zampolini M., Paolucci S., Franceschini M. Developing a minimum data set for stroke patients assessment: the "Protocollo di Minima per l'Ictus" (PMIC) as a starting point towards an Italian stroke registry - European Journal of Physical and Rehabilitation Medicine (Europa Medicophisica) 2008 September;44(3):263-9

Valutazione dell'efficacia terapeutica del sistema Elkmed EBS 2060 nel trattamento delle lombosciatalgie

M. Groppi
 U.O.S. Recupero e Rieducazione Funzionale Az. USL 9 di Grosseto Italy

Introduction. The study aims to test the efficacy of applying microwave currents produced from the apparatus ELKMED EBS 2060 in patients with low back pain. **Materials and methods.** The study, observational, sees the recruitment of a group of 30 patients with low back pain and sciatica. Before starting the treatment cycle, patients are subjected to evaluation is instrumental (X-ray, CT or MRI of LS spine) and physical examination to complete the functional assessment of spine and administration of rating scale of pain. The cycle of treatment involves patient exposure to an electromagnetic field and the application of microwave electromagnetic currents in both the lumbosacral spine is in particular points of the ear, for a total of 6 sessions weekly. Repeats the initial examination after the third session, after the sixth session and check after 45 days from the last session. If necessary, repeat the instrumental tests. **Results.** The treatment was well tolerated by the subjects, in addition to not cause side effects or adverse events. The active motility of the spine, significant data can be found in movements of flexion and extension of the lumbosacral spine, showing a steady improvement from T0 to T2, with a substantial maintenance of the improvement achieved in the control 45 days after discontinuation of therapy (T3). In relation to clinical trials, in all cases there is a significant improvement in values obtained, specifically: A reduction in the number of somites lumbar pain in axial pressure of thorny from T0 to T2 and a substantial maintenance at T3, verified by measurement of averages and are not influenced by the standard deviation; An improved tests Matthiass and Schober, resulting in gradual reduction from T0 to T2, with results essentially maintained at T3; The data obtained about the pain estimated by VAS score, show a improvement from T0 to T2 and a gradual decrease in T3. **Conclusion.** Data obtained by the proposed treatment protocol appears safe and effective in the management of pain by patients with low back pain and sciatica.

References

1. Valobra GN, Gatto R, Monticone M. Nuovo trattato di Medicina Fisica e Riabilitazione. 4 Volumi. Edizione UTET, Torino 2009.
2. Gamberini F. Biofisica della microonde e Biofisica delle onde corte. Atti del 13° Congresso SIMFER, Verona, 1983.
3. Leclerc B. Auriculothérapie. Traité d'acupuncture auriculaire. IV Edition. GLEM, Lyon, 2004.
4. Romoli M. Agopuntura auricolare. UTET, Torino, 2003.
5. Maigne R. Medicina Manuale. UTET Torino, 1996.
6. Groppi M. L'esame clinico del paziente con lombosciatalgia in Medicina Manuale (Videocorso in DVD), Ed. Solleone, 2006.

A Survey of Complex Regional Pain Syndrome in Jordanian Patients

Ziad M Hawamdeh¹, Abdelkarim S Al Oweidi², Mahmoud M Al-mustafa³

¹Department of Physical Therapy, Faculty of Rehabilitation Sciences, University of Jordan, Amman, Jordan
²Department of Anesthesia and Intensive Care, Faculty of Medicine, University of Jordan
³Department of Anesthesia and Intensive Care, Faculty of Medicine, University of Jordan, Amman-Jordan

Complex Regional Pain Syndrome is a chronic painful disease. No data, about this disease, is available in Jordan. In our study, we surveyed Jordanian patients with characteristics of Complex Regional Pain Syndrome. This retrospective survey consisted of 100 patients in the Jordan University Hospital between 2002 and 2007, with the diagnosis of CRPS Type I and II, according to the International Association for the study of pain (IASP) diagnostic criteria. All the patients had standard treatment protocol; a combination of pharmacological drugs, intravenous regional anesthesia and Stellate ganglion blockade. Information was obtained regarding patients' demographics, characteristics of CRPS, comorbidities of the patients during treatments, signs and symptoms before starting treatment and complications during and after the treatment procedures. Only 62 patients were included in the data analysis. In 58 patients, the trauma was the cause of this disease, Type I in 44 cases and Type II in 18 patients. The average number of blocks was 8.9 blocks and the range was 1-24 session (course). Limitation of range of movement was the common complaint from patients. Complications from treatment modalities were treatable and no significant morbidity was recorded. Complex Regional Pain Syndrome is a painful disease and needs an early diagnosis and management. Our protocol in treatment was effective and most of the patients were satisfied. More data collection is needed about patients, documenting the epidemiological characteristics of this disease in our area.

Fall prevention in the elderly: an integrated assessment and rehabilitation program

S Bargellesi, F. Ostan, E. Spazzoli, G. Stival, P. Pessotto
 Rehabilitation Medicine- Severe Brain Injury Unit, High Specialization Rehabilitation Hospital, Motta di Livenza (TV), Italy

Introduction. Each year, in Italy, about a third of the elderly over sixty-five is victim of a fall with relevant consequences in terms of disability, admission and mortality. An all-inclusive assessment of the risks and the setup of the aimed interventions may reduce the incidence of falls. The Medicine Rehabilitation Unit of High Specialization Rehabilitation Hospital in Motta di Livenza is performing an integrated program of clinical and instrumental assessment, educational and rehabilitation training for fall risk subjects. **Materials and methods.** Since more than a year, our Rehabilitation Unit (RU) has been adopted a program of assessment and intensive rehabilitation of subjects (> 65 year) who have already undergone previous falls or who have numerous risk factors of falling found in the history. This integrated program consists of: Screening of the fall risks through the following tests of assessment: measuring of the variations in blood pressure and cardiac frequency supine/stand up, Chair-Stand-Test, Overall-Balance-Index on a stabilometric footboard, Time-Up-and-Go-Test, Tinetti-Balance-Test, Berg-Balance-Scale, 6MWT, Activities-Specific-Balance-Confidence-Scale, SF12 Classification of subjects according to the scale of fall-risks on four levels: none(I), slightly(II), moderate(III) and elevated (IV) Execution, for the classes II-III, of two weekly sessions of training of balance and muscle reinforcement of the lower and higher limbs, activity in circuit-training using stabilometric footboard, treadmill with assessment of the gait and arm-cycloergometer and educational-informative sessions

about the risks of falling. **Results.** A randomised study has already started to verify the effectiveness of this integrated intensive program compared to a conventional treatment of motor rehabilitation.

References

1. PNLG (Programma Nazionale Linee Guida). Prevenzione delle cadute da incidente domestico negli anziani. Revisione Maggio 2009.
2. NICE. The assessment and prevention of falls in older people. Clinical practice guideline; 2004; p.21.
3. Howe TE, Rochester L, Jackson A, Banks PM, Blair VA. Exercise for improving older people. *Cochrane Database Syst Rev* 2007 Oct 17;(4):CD004963
4. Rehabilitation and Assessment Unit at the Princess of Wales Community Hospital (PWCH). Fall prevention and management program guidelines for elderly people within the community; 2006.

The attivation of a specific clinical pathway for severe acquired brain injury: a one year analysis in our rehabilitation medicine departement

S. Bargellesi¹, A. Bazzana¹, M. Semerjian¹, A. Tessari¹, G. D'Arienzo¹, A. Calabrese¹, C. Zanardo¹, E. Rodaro¹, P. Boldrini²

¹*Rehabilitation Medicine- Severe Brain Injury Unit, High Specialization Rehabilitation Hospital, Motta di Livenza (TV)*

²*Chief of Rehabilitation Medicine Department - Treviso*

Introduction. The aim of the study deals with data analysis and comparison after one year of application of a specific clinical pathway, with Severe Acquired Brain Injured (SABI) people admitted to our Rehabilitation Unit (RU); we considered only patients at the first admission to a RU (n°48 patients). To assess the pathway, we compared the group of patients admitted from our Rehabilitation Medicine Department (test group: 20 patients), with the people admitted directly from other Intensive Care Units (ICU) or Acute Units (AU), outside this clinical pathway (control group: 28 patients).

Materials and methods. We considered all the SABI patients at the first admission to a RU and discharged in 12 months (7/1/2008-6/30/2009). Data were collected from the Hospital Discharge Form and the SABI National Register. We compared indicators as time from acute event an admission to our RU, actual LOS, Level-Cognitive-Functioning in&out, Glasgow-Outcome-Scale-Extended in&out, Disability-Rating-Scale in&out, Barthel-Index-Modified in&out, Functional-Ambulation-Categories and Supervision-Rating-Scale at the discharge. **Results.** The admission in our specialized RU occurred with median 70 days from the acute event for the both group, and the long of staying in RU was median 102 days for the test group and 115 days for the control group. For the test group the LOS in ICU/AU was significantly shorter than control group, because of the first rehabilitation admission occurred in the RU of our department. In this way we certainly were able to help the ICU and AU by shortening their LOS of SABI patients. With regard to other indicators, main differences between the two groups regarded the LCF-in, DRS-in and DRS-out, BIM-in and BIM-out and with the complications (sores, tracheo-cannula ...) at the admission to our RU.

Conclusion. The application of this clinical pathway certainly allowed us to shorten the LOS of SABI people in ICU and AU, and it seems to lead to better outcome in terms of cognitive functioning and ADL autonomy at the discharge from our specialized RU.

References

1. Comitato-Sezione S.I.M.F.E.R. GCA. Protocollo di valutazione riabilitativa di minima della persona con Grave Cerebrolusione Acquisita. *Ital.J Rehab Med-MR*2006; 21:55-86.
2. Boldrini P, Maietti A, Basaglia N. "Progettazione e realizzazione di un registro regionale delle gravi cerebrolusioni acquisite in Emilia Romagna. *Europa Medicophysica* 2004; 40 (suppl. 1 to no.3): 9-1.

Osteoid Osteoma of the Olecranon – a Rare Location

M.M. Ribeiro, S. Marques, S. Magalhães, R. Vaz, P. Barros
Centro Hospitalar do Porto, Hospital de Santo António. Oporto, Portugal

Introduction. Osteoma osteoid (OO) is a small, benign tumor of bone of unknown etiology. It most commonly occurs in the tibia and femur. In other parts of the skeleton, such as the upper extremity, the clinical and imaging picture may mimic other entities, delaying correct diagnosis and resulting in a significant negative impact to the patient's quality of life. Despite its small size, the tumor should be treated because it causes intense pain and severe synovial reaction if near a joint. Post-operative recovery is usually prompt and uneventful, with very few complications reported. The

purpose of this work is to describe a case-report about a rare location of an OO, the difficulty of its diagnosis and the treatment of its post-ablation sequel. **Materials and methods.** *Case-Report.* A 20-year-old man had suffered from pain in his left elbow for 1 year, worsened at night and by activity and relieved by non-steroidal anti-inflammatory drugs. He also presented diminished range of movement (ROM). Plain X-rays were unremarkable and scintigraphy showed a lesion compatible with OO in the olecranon, confirmed by computed tomography (CT). Tumor was removed by percutaneous radiofrequency thermoablation (PRT), and the pain rapidly resolved. The limitation of flexion and extension of the elbow persisted, and patient was oriented to the Rehabilitation department. After a short rehabilitation program, patient recovered elbow ROM and became asymptomatic. **Conclusion.** Except for the location that is rare, this case-report presented a classic history of OO. PRT is the treatment of choice for non-spinal OO, and the maintenance of ROM limitation in our patient was probably related with the location of the tumor near the joint. These findings suggest that in a patient with persistent, unexplained elbow pain, a high index of suspicion is essential to consider OO as a diagnostic possibility.

References

1. GS Themistocleous et al. "Osteoid osteoma of the upper extremity. A diagnostic challenge". *Chirurgie de la main* 25 (2006):69-76.

Functional recovery and frequency of medical complications during post-acute rehabilitation of stroke patients

A. Dragin, A. Stefanovic, S. Draca, B. Ljesevic, D. Paspalj, L. Schwirtlich
Clinic for Rehabilitation "Dr Miroslav Zotovic", Belgrade, Serbia.

Introduction. The frequency of medical complications during post-acute rehabilitation of stroke patients, depends on various factors. One of the most used scales for analysing functional recovery of stroke patients, during and after rehabilitation, is Barthel Index.

Aim. Assessment of functional recovery in stroke patients using Barthel Index. Evaluation of medical complications that can influence results and duration of intrahospital phase of rehabilitation.

Materials and methods. Forty patients were monitored after stroke during intrahospital rehabilitation (2-8 weeks after stroke onset). Rehabilitation treatments were: occupational and kinesitherapies, functional electrical therapy (FET) and speech correction treatments. Barthel Index (on admission and on discharge) was used for estimation of functional recovery. Barthel Index consisted of 10 items, with total score of 100. Monitored medical complications were: urinary tract infections, deep venous thrombosis, joint and muscle pains, falls, electrolyte abnormalities, pneumonias, pressure ulcers...

Results. Younger patients without or with fewer medical complications had higher motor Barthel Index score on discharge and shorter hospitalisation. The most common medical complication were urinary tract infections and joint and muscle pains. Deep venous thrombosis and pneumonia had the most affection on hospitalisation duration. **Conclusion.** Monitoring of functional recovery in stroke patients using Barthel Index is reliable and simple way for estimation of rehabilitation outcome. Duration of hospitalisation and results of rehabilitation have multifactor connections that should be observed as such.

References

1. Geyh S, Kurt T, Brockow T. et al. Identifying the concepts contained in outcome measures of clinical trials on stroke using ICF as a reference. *J Rehabil Med* 2004; suppl 44:56-62.
2. Roth J. E, Lovell L, Harvey L. R. et al. Incidence of Risk Factors for Medical Complications during rehabilitation. *Stroke* 2001;32:523-9.
3. Popović D, Sinkjaer T. Control of Movement for the Physically Disabled. Center for Sensory-Motor Interaction, Aalborg, Denmark, 2003.

Cockayne Syndrome rehabilitation, Issues and resolution on 2 cases

Y. Ivánovic-Barbeito, S. Fernández, S. Molia (Logopedy).
Centro de referencia estatal de atención a personas con enfermedades raras y sus familias. IMSERSO (State reference center for people with rare diseases and their families. IMSERSO), Burgos-Spain—.

Introduction. Cockayne syndrome is a rare autosomal recessive disease, patients with this syndrome have short stature, progeria, neurological disorders, photosensitivity, dental problems and tendency to progressive cognitive impairment. **Materials and methods.**

We studied the treatment protocol in two brothers (older than 21 y.o.) affected by Cockayne syndrome with a phenotype of progeria-dwarfism, cachectic habit, postural problems, microcephaly, oval face, sunken eyes, thin-sharpened nose, reduced facial adipose tissue, cataract and psicomotor/ mental retardation. The most important issues are: marked ataxia complicating management in ADL and gait, confining one of the brothers to a wheelchair. The next problem is the cognitive condition, requiring one sequence or simple commands in therapy, associated with attention deficit. The issues in sitting and standing posture of these patients are kyphosis with anterior trunk flexion, making necessary postural education. Evaluation of the treatment was done by applying Bohannon scale, Tinetti scale and xiphoid-pubic symphysis distance, over a period of 5 months of physical therapy. **Results.** The improvement was evident: enhancing a degree in Bohannon scale, 5 points at Tinetti-gait and 4 at Tinetti-equilibrium, xiphoid-pubic symphysis distance improved more than 10 cm in sitting position. **Conclusion.** Deep Knowledge of neurological facilitation techniques and the problems associated with rare neuromuscular diseases are essential to improve treatment strategies and achieve optimal results. The rare diseases such as Cockayne Syndrome have the difficulty to get larger samples, but even so, the result is positive and give the pathways for the rehabilitation of this syndrome.

References

M Bayón Calatayud, J Urdiales Urdiales, RM Aienza Delgado. Cockayne syndrome: treatment and rehabilitation. Based on one case. *Rehabilitación (Madr)*. 2005;39:171-5.
 Mahmoud Adel AH, Yusef George M, Al-Hifzi Ibrahim; Diamandis Eleftherios P. Cockayne syndrome in three sisters with varying clinical presentation. *American journal of medical genetics*. 2002, vol. 111, no1, pp. 81-85

Back pain in people affected by spasticity muscular spasm post spinal cord injury

M.G. Onesta, S. Valvo, G. Patanè
U.O.C. Medicina Fisica e Riabilitativa Az. Ospedaliera per L'Emergenza Cannizzaro Catania

Introduction. The use of Botulinum Toxin A (BTA) to counteract pain is already well known in general applications as well as for applications specifically related to spasticity. The vicious circle that establishes itself at muscular level is well known to cause pain and is self-perpetuated via spasticity. Spasticity actually causes a reduction of ROM that over time leads to muscular contractures, causing pain which in turn causes spasticity. The interaction of BTA interrupts this vicious circle inhibiting the release of acetylcholine, reducing muscular contraction therefore indirectly improving muscle vascularization, consequently reducing localized hypoxia causing pain. **Materials and methods.** Two groups of patients affected by post spinal cord injury spasticity with chronic lower back pain and tetraplegia were established. Patients were distinguished Group A (9 patients) with ITB implants and group B (8 patients) without such implants. Subjective pain was evaluated with VAS; injury level with ASIA; spasticity with MAS; the well being of the patient with SF 36. The pain in all patients was located in the spine lower back region and neck region. In both groups we applied BTA to the paraspinal lower back and neck muscles and all patients continued rehabilitative therapy. **Results.** A reduction of back pain was obtained in both group A (80% of cases) and Group B (70 % of cases) followed up after 2, 4, 6 and 12 months. The reduction of pain obtained via BTA infiltration is explained not only by the localized spasticity reduction but also via other mechanisms. **Conclusion.** The BTA can be used in the treatment of the chronic low back pain of spasticity post spinal cord injury. His effect has prolonged in the time, and certain more than 6 months.

References

Wheeler AH, Open label assessment of botulinum toxin A for pain treatment in outpatient setting. *Musculoskeletal Pain*. 2001;67-82.

Functional outcome after hemiarthroplasty in elderly patients

M. Kocic, M. Lazovic, L. Dimitrijević, T. Ciric, A. Stankovic, M. Spalevic
Clinical center, Clinic of Physical Medicine and Rehabilitation, Nis, Serbia

Introduction. Displaced femoral neck fractures (DFNF) (Garden III/IV) in elderly patients are most often managed by hemiarthroplasty (HA) or total hip arthroplasty. The aim of this study was to com-

pare the functional outcome on discharge from inpatient rehabilitation after HA done in patients whose age is 80 and over between those under the age of 80. **Materials and methods.** The study included 83 healthy patients (51 women and 32 men) with DFNF treated with primary HA (Austin Moore Prosthesis), who had inpatient rehabilitation at Clinic of physical medicine and rehabilitation. They were at the time of operation 80 years old and over (on average 81.2) (group A) and under the age of 80 (on average 73.6) (group B). The inclusion criteria: intact cognitive function according to Short form mental status questionnaire > 7, prefracture ability to walk outdoors independently (with or without cane). The functional outcome assessment was performed at discharge from inpatient rehabilitation (on average 40.6 days after surgery) for each patient using: 1) pain, 2) walking ability with support (crutches or walking frame) independently or with another person and 3) active and passive hip flexion. We also noted and compared complications. **Results.** There were no significant differences between the groups in relation to all researched parameters (p>0.05). **Conclusion.** HA in patients with DFNF who are 80 years old and over resulted in similar functional outcome like in patients under the age of 80.

References

Sipilä J, Hyvönen P, Partanen J, Ristiniemi J, Jalovaara P. Early revision after hemiarthroplasty and osteosynthesis of cervical hip fracture: short-term function mortality unchanged in 102 patients. *Acta Orthop Scand*. 2004; 75(4): 402-7.

Rehabilitation Treatment for Spatial Neglect: Manipulating Brain Plasticity in Neural Networks for Spatial Attention and Space Representation

Nachum Soroker
Loewenstein Rehabilitation Hospital and Sackler Faculty of Medicine, Tel Aviv University, Israel.

Introduction. Unilateral spatial neglect (USN) is a multi faceted and multi factorial symptom complex where the most prominent features stem from impaired allocation of attention to objects and events occurring in contralesional space. It is a major disabling condition connected with extended length of stay in rehabilitation and poor functional outcome. The full syndrome is seen usually following stroke in the posterior regions of the right middle-cerebral artery territory. Current theorizing stresses the causative role of impaired space representation and impaired mechanisms of spatial attention. **Materials and methods.** I intend to present in this lecture experimental data gathered recently at the Loewenstein Rehabilitation Hospital, Raanana, Israel, showing the efficacy of the following theory-motivated treatments for USN: a. ipsilesional eye-patching combined with visual search training; b. mesh-glove electrical stimulation of the contralesional hand; c. visual search training combined with phasic alerting; d. prism adaptation; and e. EEG bio-feedback. **Results.** Results show that none of the above treatment strategies is effective for all USN patients. Moreover, some treatments might be beneficial only after a given point in the recovery phase, showing deleterious effects if applied earlier. On the other hand, a multiple single-case design reveals clear beneficial effects for part of the patients. **Conclusion.** At the present stage of our understanding of USN, the selection of a treatment strategy for a given USN patient is dictated essentially by trial and error. This policy might be refined by the application of short feasibility tests prior to treatment assignment. In addition, the multifactorial nature of the syndrome calls for theory-based application of assessment methods targeting the different underlying factors, in each individual case. This information can guide decision making concerning the selection of the appropriate treatment for a given patient, in accord with his/her specific pattern of deficits.

Acupuncture and stroke: confrontation between somatic acupuncture and cranioacupuncture in the treatment of motor deficiencies

L. Guarinoni, F.Noro, S. Galeri, A. Testa
"E. Spalenza" Rehabilitation Centre, Fondazione Don Gnocchi, Rovato (Brescia)

Introduction. This study aims to identify the efficacy of acupuncture in the treatment of motor deficiencies after stroke, in association with traditional clinical and rehabilitation treatment. The study aims to compare the different efficacy between somatic acupuncture (

Xing Nao Kai Qiao) and cranioacupuncture. **Materials and methods.** 24 patients affected by recent stroke. Age: range 60-80 years. 3 randomized treatment groups: 8 patients were treated with traditional rehabilitation and cranioacupuncture; 8 patients were treated with traditional rehabilitation and somatic acupuncture (Xing Nao Kai Qiao); 8 patients were treated with traditional rehabilitation. Acupuncture was provided 1hour 5 days a week , lasting ten weeks. Exclusion criteria: encephalopathy multiinfarct disease, dementia, neurodegenerative diseases, respiratory insufficiency, uncompensated diabetes mellitus, neuropathies, cancer, arrhythmia, pace-maker. First evaluation (T0), included: neurological and physiatric examination; Motricity Index, Trunk Control Test, Canadian Neurological Scale, Ashworth Spasticity Scale, Tinetti scale;, cerebral RNM , chest x-ray. Second evaluation (T1 – 1 month) included: neurological and physiatric examination ; Motricity Index, Trunk Control Test, Canadian Neurological Scale, Ashworth Spasticity Scale, Tinetti scale. Third evaluation (T2 -2 monthes) included neurological and physiatric examination ; Motricity Index, Trunk Control Test, Canadian Neurological Scale, Ashworth Spasticity Scale, Tinetti scale; cerebral RNM. **Results.** Final data analysis is on elaboration. Preliminary results : somatic acupuncture seems more effective in spasticity treatment, cranioacupuncture seems to improve upper and lower extremity motricity. **Conclusion.** The results of this study are actually uncomplete, but seem to confirm the importance of early start of acupuncture treatment in stroke patients.

References

1. Zhang SH, Liu M, Asplund K, Li L, "Acupuncture for acute stroke" (Review)The Cochrane collaboration 2008.
2. Kai-hoi F, Wong E, Lau J, Woo J, "Does acupuncture improve motor recovery after stroke?" Stroke 33:2604-2619 2002.
3. Wayne P, Krebs D, Macklin E, Schnyer R, "Acupuncture for upper-extremity rehabilitation in chronic stroke: randomized sham-controlled study" Arch Phys Med Rehab Vol 86 2005.

Action Observation in Stroke Patients: Investigating the Mechanism Using EEG

Frenkel-Toledo Silvi^{1,2}, Bentin Shlomo³, Liebermann Dario⁴, Soroker Nachum^{1,2}

¹Sackler Faculty of Medicine, Tel Aviv University, Israel

²Department of Neurological Rehabilitation, Loewenstein Hospital, Raanana, Israel

³Department of Psychology, Hebrew University, Jerusalem, Israel

⁴Department of Physical Therapy, Tel-Aviv University, Ramat-Aviv, Israel

Introduction. Numerous behavioral studies among healthy subjects show that motor action observation (AO) can enhance the actual motor performance of the passive observer. There is evidence suggesting that this effect involves recruitment of the fronto-parietal "Mirror Neuron System" (Rizzolatti et al., 2009). A stable manifestation of cortical activation during AO is the attenuation of power in the alpha (8-13Hz) frequency band of the EEG, in electrodes recording from the sensorimotor cortex (Perry & Bentin., 2009). Our aim is to investigate whether this phenomenon, termed α suppression, can be used clinically to monitor the neurophysiological effects of AO applied in different conditions, and among stroke patients with lesions to various cortical and subcortical regions of interest. Our current clinical focus is on AO use for enhancement of motor activity in the hemiparetic upper limb. **Materials and methods.** Experimental Design: A mixed design, with "Groups" as the between-subject factor (two levels: Controls and Patients) and "Conditions" as the within-subject factor. α suppression is recorded via EEG from stroke patients and healthy control participants while they either observe or execute manual movements (8 conditions). Electromyography is recorded from upper-limbs muscles in order to understand if α suppression is affected only by observation or also by covert movements. Voxel-based lesion symptom mapping methodology is used to identify brain regions of interest that may affect α suppression during AO. **Results.** Preliminary results in healthy subjects show the following: Observing video clips demonstrating human upper limb reach and grasp movement produces much more α suppression compared to observaion of moving balls. The two hemispheres show a distinct pattern of α suppression as a function of the viewed upper limb and the observer's viewpoint. **Conclusion.** EEG analysis focusing on the attributes of α suppression can easily be done within the rehab setting, and is likely to shed important light on the neurophysiological mechanisms underlying AO effects, thus helping to select the optimal presentation modes for patients with various types of motor control dysfunction.

References

1. Rizzolatti, G., Fabbri-Destro, M. and Cattaneo, L. Mirror neurons and their clinical relevance. Nat. Clin Prac Neurol 2009; 15(1):24-34.
2. Perry, A. and Bentin, S. Mirror activity in the human brain while observing hand movements: A comparison between EEG desynchronization in the α -range and previous fMRI results. Brain Res 2009; 1282:126-132.

Stroke: Botulinum toxin in Hemiplegic Shoulder Pain

E.A. Sevilla-Hernandez¹, J.V. Lozano-Guadalajara¹, I. Martinez-Gonzalez-Moro²

¹Rehabilitation Unit of Morales Meseguer General Hospital, Murcia, Spain

²Physiotherapy Department of Murcia University, Murcia, SpainInstitution

Introduction. Hemiplegic shoulder pain (HSP) is one of the most frequent complications in stroke. Advanced age, extent brain damage, speech and intellectual impairment, spasticity, incontinence and flaccid paralysis have been related to its development. Adductors and internal rotators are the main muscular agents although trapezius can cause pain too, shoulder elevation and cervical range of motion reduction. The objective of this work was to describe clinical situation in patients with HSP secondary to stroke treated with botulinum toxin (BT) in Morales Meseguer General Hospital Rehabilitation Unit in 2005 and determine which elements are better in evaluation. **Materials and methods.** Descriptive prospective analysis in spastic stroke patients treated with BT obtaining epidemiologic and clinic variables: resting angle, passive and active range of motion using standard goniometry, muscular test (Medical Research Council Scale), Ashworth index (Modified Ashworht Scale), pain index (Visual Analogue Scale - VAS) and adverse events. **Results.** 5 hemiplegic patients (3 men, 2 women) with spastic shoulder were treated in 2005 (from January to December). The mean age was 59±14 [39-71] years. Muscle groups infiltrated: trapezius (2), pectoralis maior (5), subscapularis (3) and latissimus dorsi (1). Doses were adjusted to weight and muscle mass. Muscle force, range of motion and resting angle didn't show significant changes. Ashworth index decreased 2 grades (from 3 to +1) in 60%. Differences of 2 points were detected in VAS. None adverse events were detected. **Conclusion.** Standard goniometry, muscle balance, Ashworth and pain scales were useful in finding postinfiltration changes in HSP. Botulinum toxin is a reversible, secure and efficient agent with rare and transient adverse events.

References

1. Ashford S, Turner-Stokes L. Management of shoulder and proximal upper limb spasticity using botulinum toxin and concurrent therapy interventions: a preliminary analysis of goals and outcomes. Disabil Rehabil 2009;31(3):220-6.
2. Lim JY, Koh JH, Paik NJ. Intramuscular botulinum toxin-A reduces hemiplegic shoulder pain: a randomized, double-blind, comparative study versus intraarticular triamcinolone acetone. Stroke 2008;39(1):126-31.
3. Marco E, Duarte E, Vila J, Tejero M, Guillen A, Boza R, Escalada F, Espadaler JM. Is botulinum toxin type A effective in the treatment of spastic shoulder pain in patients after stroke? A double-blind randomized clinical trial. J Rehabil Med 2007;39(6):440-7.

Stroke: Botulinum toxin in Wrist spasticity

E.A. Sevilla-Hernandez¹, J.V. Lozano-Guadalajara¹, I. Martinez-Gonzalez-Moro²

¹Rehabilitation Unit of Morales Meseguer General Hospital, Murcia, Spain

²Physiotherapy Department of Murcia University, Murcia, Spain

Introduction. Spastic wrist flexion (SWF) is a frequent deformity in stroke. It is mainly caused by flexor carpi radialis and flexor carpi ulnaris. Flexor digitorum superficialis and profundus can be involved too. This deformity can produce functional impairment because it interference in getting dress, hygiene and other hand activities. The aim of this work was to describe clinical situation in patients with SWF secondary to stroke treated with botulinum toxin (BT) in Morales Meseguer General Hospital Rehabilitation Unit in 2005 and determine which elements are more useful in evaluation. **Materials and methods.** Descriptive prospective analysis in spastic stroke patients treated with BT obtaining epidemiologic and clinic variables: resting angle, passive and active range of motion with standard goniometry, muscular test (Medical Research Council Scale), Ashworth index (Modified Ashworht Scale), functional level (Brunnström Scale), orthosis adaptation and adverse events. **Results.**

22 hemiplegic patients (17 hombres, 5 mujeres) with wrist flexion spasticity were treated in 2005 (from January to December). The mean age was 65 ± 13 [38 – 82] years. Muscle groups infiltrated: flexor carpi radialis (7), flexor carpi ulnaris (2), flexor digitorum profundus (17) and superficialis (17). Doses were adjusted to weight and muscle mass (125-250 IU of BT Dysport® type). Muscle force (88%), range of motion (passive 48%; active 78%) and resting angle (55%) didn't show significant changes. Asworth index decreased 2 grades in 63%. 27% showed functional improvement. 64% got wrist-hand orthosis adaptation (56% up to eight hours). None adverse events were detected. **Conclusion.** Standard goniometry, muscle balance, Ashworth and Brunnstrom scales were useful in finding postinfiltration changes in SWF. Botulinum toxin is a reversible, secure and efficient agent with rare and transient adverse events.

References

- Childers MK, Brashear A, Jozefczyk P, Reding M, Alexander D, Good D. Dose-dependent response to intramuscular botulinum toxin type A for upper-limb spasticity in patients after a stroke. *Arch Phys Med Rehabil* 2004;85:1063-1069.
- Elovic EP, Brashear A, Kaelin D, Liu J, Millis SR, Barron R, Turkel C. Repeated treatments with botulinum toxin type A produce sustained decreases in the limitations associated with focal upper-limb poststroke spasticity for caregivers and patients. *Arch Phys Med Rehabil* 2008;89(5):799-806.
- Turner-Stokes L, Ashford S. Serial injection of botulinum toxin for muscle imbalance due to regional spasticity in the upper limb. *Disabil Rehabil* 2007;29(23):1806-12.

Stroke: Botulinum toxin in Spastic Hand

E.A. Sevilla-Hernandez¹, J.V. Lozano-Guadalajara¹, I. Martinez-Gonzalez-Moro²

¹Rehabilitation Unit of Morales Meseguer General Hospital, Murcia, Spain

²Physiotherapy Department of Murcia University, Murcia, Spain

Introduction. Hand flexion spasticity (HFS) in cerebrovascular disease can be caused by flexor digitorum superficialis and profundus, interosseus and those responsible for thumb-in-palm deformity. It affected metacarpophalangeal (MCF) – interphalangeal (IP) flexion with the inclusion in palm of first finger. Patients experienced pain and difficulties with dressing, washing and other hand activities. The aim of this work was to describe clinical situation in patients with HFS secondary to stroke treated with botulinum toxin (BT) in Morales Meseguer General Hospital Rehabilitation Unit in 2005 and determine which elements are more useful in evaluation. **Materials and methods.** Descriptive prospective analysis in spastic stroke patients treated with BT obtaining epidemiologic and clinic variables (resting angle, passive and active range of motion with standard goniometry, muscular test (Medical Research Council Scale), Ashworth index (Modified Ashworth Scale), functional level (Brunnstrom Scale), orthosis adaptation and adverse events. **Results.** 24 hemiplegic patients (19 hombres, 5 mujeres) with hand-finger flexion spasticity were treated in 2005. The mean age was 65 ± 13 [38 – 82] years. Muscle groups infiltrated: flexor digitorum profundus (17) and superficialis (17) interosseus (8), flexor pollicis (longus 3; brevis 3) and adductor pollicis (2). Doses were adjusted to weight and muscle mass (75-250 IU of BT Dysport® type). We used one point of infiltration with electromyographic guidance. Muscle force (MCF 76 - IP 96%), range of motion (passive 75-100%; active 71-87%) and resting angle (50-55%) didn't show significant changes. Asworth index decreased 2 grades in 54-46%. 22% showed functional improvement. 64% got Wrist-Hand orthosis adaptation (56% up to eight hours). None adverse events were detected. **Conclusion.** Standard goniometry, muscle balance, Ashworth and Brunnstrom scales were useful in finding postinfiltration changes in HFS. Botulinum toxin is a reversible, secure and efficient agent with rare and transient adverse events.

References

- Mayer NH, Simpson DM. Preface. En: Spasticity; Etiology, Evaluation, Management and the role of Botulinum Toxin. Mayer NH, Simpson DM, eds. New York: WE MOVE 2002.
- Slawek J, Bogucki A, Reclawowicz D. Botulinum toxin type A for upper limb spasticity following stroke: an open-label study with individualised, flexible injection regimens. *Neurol Sci* 2005;26(1):32-3.
- Chang CL, Munin MC, Skidmore ER, Niyonkuru C, Huber LM, Weber DJ. Effect of baseline spastic hemiparesis on recovery of upper-limb function following botulinum toxin type A injections and postinjection therapy. *Arch Phys Med Rehabil* 2009;90(9):1462-8.

Botulinum toxin in stroke: Rehabilitation unit experience

E.A. Sevilla-Hernandez¹, J.V. Lozano-Guadalajara¹, I. Martinez-Gonzalez-Moro²

¹Rehabilitation Unit of Morales Meseguer General Hospital, Murcia, Spain

²Physiotherapy Department of Murcia University, Spain

Introduction. The aim of this study was describe clinical situation of patients with spasticity caused by cerebrovascular disease treated with botulinum toxin (BT) in Morales Meseguer General Hospital's Rehabilitation Unit in 1999-2004. **Materials and methods.** Retrospective descriptive study on case histories of patients with spastic PC treated with BT in 1999-1004. Obtained variables: epidemiologic, clinic and treatment related. **Results.** 47 spastic patients (29 men, 18 women). The mean age was $63,4 \pm 11,28$ [37,48-87,04] years. 96% were hemiplegic and 4% tetraplegic. All cases could walk: 50% needed support (2 walker, 3 two canes, 18 one cane). They used Hand-Wrist (1) and Ankle-Foot (3) orthoses. Treatment objectives were pain control, spasticity reduction, orthosis adaptation, gait pattern and upper extremity function improving. BT doses were adjusted to weight and muscle mass. Shoulder adductors-internal rotators (10) and elbow flexo-extensors (15) didn't need electromyographic (EMG) guidance but it was necessary in wrist (10) and hand-fingers flexors (25). Adductors (2); knee flexors (7); ankle flexors (39); foot finger's flexors didn't need EMG guidance except tibialis posterior (13) and finger's flexors. None adverse events were reported. **Conclusion.** Heterogeneity in terms of age and spasticity location was the main characteristic of our population limiting results comparison. Botulinum toxin results a reversible, secure and efficient treatment in stroke.

References

- Mayer NH, Simpson DM. Preface. En: Spasticity; Etiology, Evaluation, Management and the role of Botulinum Toxin. Mayer NH, Simpson DM, eds. New York: WE MOVZ 2002.
- Elia AE, Filippini G, Calandrella D, Albanese A. Botulinum neurotoxins for post-stroke spasticity in adults: a systematic review. *Mov Disord* 2009;24(6):801-12.

Neurologic impairment at the onset of Behcet's disease

E.A. Sevilla¹, L. Garrote¹, M. LLopez¹, C. Corrochano¹, L. Cano¹, R. Villaverde¹

Morales Meseguer University General Hospital (MMUGH)

¹Rehabilitation Unit

²Neurology Unit

Introduction. Neurologic disease occurs in fewer than one-fifth of patients with Behcet's disease (BD). Focal parenchymal lesions and complications of vascular thrombosis are the most common abnormalities. Other manifestations: aseptic meningitis/encephalitis, arterial vasculitis, personality change, psychiatric disorders and dementia. Peripheral neuropathy is not common and neurologic impairment appear concurrently or precede non-neurologic symptoms in rare cases. We present the clinical case of a patient with neurological manifestations at the onset of BD. **Materials and methods.** Retrospective analysis of case history of a woman affected by neurological impairment secondary to BD attended in Rehabilitation Unit (RU) of MMUGH from 2008-2010. **Results.** A 33 years old woman attended at Neurology Unit in 2008 suffered a febrile syndrome and respiratory symptoms in the previous four days followed by exantematic lesions, generalized weakness, paresthesia, sensitive level and orthostatic dizziness. None alteration was detected in imaging, serologic and laboratory tests. Electromyography only showed poor motor unit recruitment. She developed: flaccid tetraplegia, dysautonomy, feet disesthesia and neurologic bladder. Treatment consisted of systemic steroids-immunoglobulines and physical therapy. First diagnosis was meningiopoliradiculitis probably caused by viral agent. A comprehensive rehabilitation programme was adapted (kinesitherapy and electrotherapy) to improve motor and pain control. She progressively developed a spastic pattern: spastic scoliosis, left hip external rotation and equinovarus. She needed a Foot-Ankle orthoses and two canes to walk. Aproximadly one year later during a stance in Neurology with left hemiplegia, left eye cuadrantanopsia and muco-cutaneous lesions (oral ulcerations, papulo-vesiculo-pustular eruptions, nodules and pseudofolliculitis). Magnetic resonance showed a parietal lesion and pathology test results positive. It permitted its classification as BD. She received prednisone and azatrioprine. **Conclusion.** Neurological manifestations are rare in the onset of Behcet's disease. In those

patients with neurological symptoms and negative imaging and laboratory tests, BD diagnosis should be considered. Rehabilitation of such conditions must control functional impairment.

References

Benamour, S, Najji, T, Alaoui, FZ, et al. [Neurological involvement in Behcet's disease. 154 cases from a cohort of 925 patients and review of the literature]. *Rev Neurol (Paris)* 2006; 162:1084.
 Farah, S, Al-Shubaili, A, Hussein, JM, et al. Behcet's syndrome: A report of 41 patients with an emphasis on neurologic manifestations. *J Neurol Neurosurg Psychiatry* 1998; 64:382. Farah, S, Al-Shubaili, A, Hussein, JM, et al. Behcet's syndrome: A report of 41 patients with an emphasis on neurologic manifestations. *J Neurol Neurosurg Psychiatry* 1998; 64:382.

Efficacy of diclofenac sonophoresis in musculoskeletal pain reduction

V. Keković, S. Markez, D. Gajić, J. Nikolić, D. Zivanić
Institute for physical medicine and rehabilitation "Dr Miroslav Zotović"

Introduction. Frequent use of NSAID's against musculoskeletal pain and significant side effects of their systemic use are important reasons for establishing of efficacy of their topical use aiming for fast pain relief in the target population.(1,2) **Materials and methods.** Prospective; 31 patients (17 men; 14 women); average age of 50; 13 with joint rheumatism and 18 with soft tissue rheumatism. Pain intensity measured by visual analogue scale (VAS), in rest and movement, before and after 10 procedures. Patients treated with diklofenac sonophoresis (continuous ultrasound 0,8-1 W/cm², 5-10 minutes) (2). **Results.** Soft tissue rheumatism: 55,5% rest pain relief; 22,2 % in movement; 22,2 % significant rest pain decrease; 77,8 % in movement Joint rheumatism: 30, 8 % rest pain relief; 38, 4% significant rest pain decrease; 53, 8% pain relief in movement. **Conclusion.** Diklofenac sonophoresis is significantly effective in soft tissue rheumatism pain relief, as well as in joint rheumatism pain decrease.(3,4)

References

1. Woolf A, Pfleger B, Burden of major musculoskeletal conditions. *Bull WHO*, 2003. 81: 646-56
 2. Zacher J, Altman R, Bellamy N, Brühlmann P, Da Silva J, Huskisson E, Taylor RS. Topical diclofenac and its role in pain and inflammation: an evidence-based review. *Curr Med Res Opin.* 2008 Apr;24(4):925-50
 3. Vlak T. Comparative study of the efficacy of ultrasound and sonophoresis in the treatment of painful shouder syndrome Reumatizam. 1999;46(1):5-11
 4. Erdogmus CB, Resch KL, Funovics MA, Ebenbichler GR. Ultrasound therapy for calcific tendinitis of the shoulder. *N Engl J Med.* 1999 May 20;340(20):1533-8

Pain intensity after surgically treated hip fractures

D. Gajić, G. Ljubojević, V. Keković, J. Nikolić, B. Majstorović
Institute for physical medicine and rehabilitation "Dr Miroslav Zotović"

Introduction. Hip fractures are the most common complications of falls in elderly population. Postoperative pain intensity contributes to already reduced functional status of geriatric population and also delays rehabilitation process. The aim of the research is to indicate correlation of pain intensity and different surgical treatments of hip fracture. **Materials and methods.** 32 patients were followed by prospective analysis (20 women, 12 men), average age 75,3 years. According to method of surgical treatment patients were divided into three groups: A) Total hip endoprosthesis implantation; B) Partial hip endoprosthesis implantation; C) Osteosynthetic surgical care. The pain intensity was measured by VAS, before and after 28 days long physical treatment. **Results.** After the treatment 63,6% of patients in group A have been completely without pain. In group B 43,7% of patients has been achieved a significant reduction of pain. In group C 20% of patients have been completely without pain. **Conclusion.** The minimum postoperative pain intensity has been achieved in patients after implanted total hip endoprosthesis, and that has been the fastest adequate functional recovery.^{2,3}

References

1. Smrke D, Biscevic M, Hip fracture—personal, family and social problem of the third age], *Klinika za traumatologiju, Ljubljana, Slovenija. Acta Med Croatica.* 2008; 62(3):257-62 (ISSN: 1330-0164)
 2. G. Holt, MBChB, MRCS, R. Smith, PhD, K. Duncan, MSc, BA, J.D. Hutchison, PhD, FRCSEd, FRCSE and A. Gregori, MBChB, FRCS(Tr&Orth). Outcome After Surgery for the Treatment of Hip Fracture in the Extremely Elderly. *Journal of Bone and Joint Surgery (American).* 2008;90:1899-1905.

3. R. Sean Morrison, MD; Steven Flanagan, MD; Daniel Fischberg, MD, PhD; Alexie Cintron, MD, MPH; Albert L. Siu, MD, MSPH. A Novel Interdisciplinary Analgesic Program Reduces Pain and Improves Function in Older Adults After Orthopedic Surgery. *J Am Geriatr Soc.* 2009;57(1):1-10.

Measurement of Disability in persons with Marfan Syndrome

C. Gallo¹, V. Bozzo², B. Contini², C. Foti³

¹Ph.D. School

²Specialization School

³Chair

Tor Vergata University, Rome, Italy

Introduction. Marfan Syndrome is a genetic disorder of the connective tissue (2-3 cases/10.000) affecting the musculoskeletal, ocular, cardiovascular systems (aortic dilation and dissection). It is one of the most lethal and debilitating diseases known. It is diagnosed through use of the Ghent criteria. New pharmaceutical/surgical care has increased patient's life expectancy by almost 20 years. Studies on QoL indicate that 97% of patients feel handicapped. The goal of our work was to evaluate a patient's impairment through an instrument which was quantitative, qualitative, prognostic and useful in a multidisciplinary rehabilitation setting. **Materials and methods.** We evaluated functional scales in relation to the comorbidities and QoL in Marfan these were: SF36, QoL, Rankin scale, Tinetti Scale, FIM, Barthel, ADL/IADL, Borg scale, Test Vittorio, ROM, MOC, 6 minutes walking test, Kendall's posture evaluation, Cobb's Scoliosis evaluation, VAS scale, Ritchie index. Then these were compared to the ability of relative ICF items to codify levels of disability consistently and specifically. ICF items were selected in three rounds of revision using the core sets for pain, arthrosis, osteoporosis, low back pain, cardiovascular and respiratory and items with possible prognostic value in rehabilitation of Marfan were identified. **Results.** The ICF was found to be the most specific and sensitive instrument when applied to Marfan syndrome. **Conclusion.** The multidisciplinary and international language of the ICF is particularly interesting for Marfan and other like pathologies with high levels of comorbidity such as geriatric pathologies. Therefore increased research efforts in that direction are to be encouraged.

References

David I. Silverman MD, Kevin J. Burton BS, et al. Life Expectancy in the Marfan Syndrome: The American Journal of Cardiology-Volume 75, Issue 2,15 January 1995, pages 157-160.
 Bart Loeys,MD;Lieve Nuytinx,PhD;et al. Genotype and Phenotype Analysis *Arch. Intern Med.*2001;161:2447-2454
 Cieza A, Geyh S, Chatterji S, Kostanjsek N, Ustün BT, Stucki G. Identification of candidate categories of the ICF for a Generic ICF Core Set based on regression modelling. *BMC Med Res Methodol.* 2006 Jul 27;6:36.

Robot-assisted hand training (Amadeo) compared with conventional physiotherapy techniques in chronic ischemic stroke patients: a pilot study

R. Helbok, G. Schoenherr, M. Spiegel, M. Sojer, C. Brenneis

Introduction. Stroke is considered one of the leading causes of neurologic disability in adulthood. Our objective was to compare the effects of robot-assisted movement training (Amadeo) with conventional techniques for the rehabilitation of hand-motor-function after stroke. **Materials and methods.** This prospective randomized controlled pilot-study is currently ongoing at a university hospital. All patients followed a structured protocol (45min/session, 3 sessions/wk for 8wks), which was approved by the IRB. Subjects in the robot-group (Amadeo) practiced active-assisted, passive and task-oriented repetitive hand/finger training. Clinical arm/hand motor-function (Fugl-Meyer score [FM], Modified Ashworth Scale, finger range of motion [ROM], motor activity log [MAL]), were used as outcome measures. Clinical evaluations were performed by a therapist blinded to group assignments. **Results.** No major side effects occurred. Preliminary data analysis includes 12 (of 40 expected) patients, with 8 having completed (4/4). Arm function of all patients improved, with FM total [distal] scores increasing from 15-to-24 [3-to-9], 20-to-28 [3-to-5], 22-to-31 [6-to-9], and 55-to-56 [23-to-23] in the Amadeo-group, and 44-to-58 [11-to-20], 46-to-52 [16-to-19], 47-to-49 [18-to-23] and 58-to-62 [20-to-23] in the controls. Modified Ashworth Scale improved in all patients besides two, who did not have spasticity at baseline. The MAL improved in all patients (39-66 points in robot group and 27-66 in the conventional therapy group) as did

ROM. **Conclusion.** Improving hand function is a major component of post-stroke rehabilitation. Our preliminary results demonstrate that both, conventional physiotherapy and this hand-robotic-device, may improve motor-function of the hand. So far no statistical comparison can be made. The Amadeo is safe, and easy to use in a clinical setting. Both therapies may have an impact on activities of daily living.

Tethered cord syndrome in Arnold Chiari Malformation: a challenge in rehabilitation. A case report

I. Springhetti, A. Zancan, S. Rossi

Divisione di Recupero e Riabilitazione Funzionale sez. Riabilitazione Neuromotoria

Introduction. Tethered spinal cord syndrome is a neurological disorder caused by tissue attachments of the spinal cord within the spinal column causing abnormal strain of the medulla. The disorder is the result of improper growth of the neural tube. The progression may go undiagnosed until adulthood, when sensory, motor problems and loss of bowel-bladder control emerge. A CSF flow block causes syringomyelia, with additional loss of movement, pain and/or autonomic symptoms. **Materials and methods.** We discuss a case of a young girl affected by Tethered Spinal Cord in a complex Arnold Chiari Syndrome, who underwent surgical intervention. We examine rehabilitation protocol results, presenting clinical features and instrumental reports: after surgical procedure, at four weeks, and at 1 year follow-up. **Results.** Immediate symptoms relief and relevant changes in motor control. Improvements in: functional pattern in everyday life, walking pattern and speed, multiple conditions balance, autonomic functions, hand dexterity. Absent occipital pain. Previous clinical signs suddenly reappearance showing progressive deterioration, notwithstanding additional therapy. **Conclusion.** Despite relevant clinical and instrumental improvement, some neurological worsening appear after six months. Hypothesis are analyzed. A MRI detecting CS fluid circulation, finds the Arnold-Chiari proximal irreversible fibers damage or progressive new damage due to persistent cervical syringe responsible for clinical progression of defect. A new surgery is prospecting in order to eliminate the previously undetectable cause.

References

Neurosurgical management of spinal dysraphism and neurogenic scoliosis. Cardoso M, Keating RF. *Spine (Phila Pa 1976)*. 2009 Aug 1;34(17)
 Association of Chiari malformation type I and tethered cord syndrome: preliminary results of sectioning filum terminale. Milhorat TH, Bolognese PA, et al. *Surg Neurol*. 2009 Jul;72(1):20-35.
 Syndrome of occipitoatlantoaxial hypermobility, cranial settling, and chiari malformation type I in patients with hereditary disorders of connective tissue. Milhorat TH, Bolognese PA, et al. *J Neurosurg Spine*. 2007 Dec;7(6):601-9.

Conservative treatment associated with PNF of motor deficit extension of the wrist and fingers in of the radial nerve injury: case report

G. Giovannico¹, F. Maselli², M. Cannone³, A. Rahino⁴, M.L. De Nuzzo⁵, G. Urso⁶, M. Lanzetta⁷

¹PT, OMT, Coordinator Orthopedic Rehabilitation Division, "Santa Chiara" Institut?, LECCE
²BSc, PT, OMT, Teaching Assistant Master RDMs University of Genoa, Medical Superintendent regional Puglia-INAIL, BARI
³BSc, PT, "Padre Pio" Foundation Rehabilitation Centers, FOGGIA
⁴BSc, PT, "Saint'Agostino" Institute, BARI
⁵PT, OMT, "La Nostra Famiglia" Association, BRINDISI
⁶PT, Director of the Center for Rehabilitation "Il Carrobiolo", MONZA
⁷MD, Microsurgery Specialist, President of Italian Society for Hand and Functional Transplantation, President of International Hand and Composite Tissue Allotransplantation Society, Director of Italian Institute of Hand's Surgery, Monza

Introduction. Proprioceptive Neuromuscular Facilitations are a form of treatment based on proprioceptive stimulation through provocative impulses from the receptors of motion. This technique, invented in the early 40's and evolved over the years, is now used in many medical conditions, both of neurological and orthopedic nature, including SNP injuries. The A.A. have used this technique, involving the use of orthoses and rehabilitation on a patient with conventional left radial nerve axonotmesis for a motor deficit of extension of the wrist and fingers. **Materials and methods.** The PNF were

administered adding them to the use of a mentor pro-radial and conventional rehabilitation treatment, resolution of adhesions and scarring lymph drainage for about 20 months, with first a tri-weekly frequency and later a twice-weekly frequency. **Results.** The A.A. assessed the state-motor function of the patient on three occasions, before training, 3 months later and at the end. The evaluation was performed using a diagnostic instrument (EMG) and behavioral function with an accurate budget. **Conclusion.** The results of this treatment were a complete recovery of the wrist and finger extensor deficit and therefore the functionality of the hand after only 3 months with a residual weakness greatly improved in the outcome assessment to 18 months.

References

Effect of Proprioceptive Neuromuscular Facilitation on the Gait of Patients With Hemiplegia of Long and Short Duration Ray-Yau Wang; *Physical Therapy* 1994 74: 1108-1115.

Impact of Virtual Rehabilitation on Neuromuscular Control by means of the Wii Fit

D.N. Bassett^{1,3,5}, E. De Canonico¹, A. Archilietti¹, A.M. Orsolino⁴, G.G. Cerulli^{1,2,5}

¹Let People Move Biomechanical Laboratory, Perugia, Italy
²Nicola's Foundation Onlus, Arezzo, Italy
³Center for Biomedical Engineering Research, University of Delaware, Newark, USA
⁴Medicina & Chirurgia, Università degli Studi di Perugia, Perugia, Italy
⁵Ortopedia e Traumatologia, Università degli Studi di Perugia, Perugia, Italy

Introduction. Virtual reality has a promising future in the field of biomechanics as it facilitates interaction between a patient and a rehabilitation system. The present study investigates the Wii Fit as it lends itself well to home rehabilitation programs. Improvement in stabilometry results have been reported in recent studies (Brown 2009, Nitz 2009). However, in this preliminary study, we are focusing on the scientific validity of Wii Fit training on neuromuscular control. **Materials and methods.** Two healthy subjects (26.5±1.5) trained for 8 weeks, 30 minutes a day, performing Wii Fit exercises. Before and after the training period, functional biomechanical tests (gait, hop, and one leg stabilometry) were performed while motion (Vicon®) and EMG (from three superficial quadriceps, ischiocrural, and gastrocnemii) data were collected. One of the analyses performed summed normalized electromyographic activations by muscle group to calculate the cocontraction ratio (CCR), which is a value between 0 and 1 that indicates equalizing activation as it increases (Lloyd 2005). **Results.** The CCR for gait and hopping motions decreased after training, indicating an increase in focused muscle control. However, the stability tests showed increased CCR between gastrocnemii and hamstrings after training, suggesting an improved ability to achieve intra-articular equilibrium during the stability test. **Conclusion.** The present study, supported also by motion data, points to promising applications of virtual rehabilitation by means of the Wii Fit system. Improvement in neuromuscular control was noted, which gives us confidence in the use of this system as a physical therapy resource pending larger population testing. A follow-up study is in development and set to emphasize subject training on quasi-isometric, proprioceptive, lower limb-strengthening, and fine motor control exercises.

References

Brown R. et al., *Int J Rehab Res*. 32:S109-S110, 2009.
 Nitz J.C. et al., *Climacteric*. 0:1-6, 2009.
 Lloyd D.G. et al., *Med Sci Sport Exer*. 37:1939-1947, 2005.

Pain management and exercise therapy for succesful treatment of severe persistent low back pain

M. Guglielmetto¹, G. Calcarella², G. Trevisan¹, D. Primon¹

¹Department of physical and rehabilitation medicine, Az. Ulss 15 "alta Padovana" (PD)
²Operative Unit of Anesthesiology and Intensive Care, Pain Management, Az. Ulss 15 "alta Padovana" (PD)

Introduction. Although widely used as one of the most important interventions in low back pain to achieve stable pain control, exercise therapy is often difficult to introduce in cases of persistent or recurrent non-specific severe low back pain, mainly for the possi-

bility of exacerbation of pain after months, and sometimes years, of pharmacological and physical therapy treatments. This causes prolonged treatments with and the risk of high drop-out rate caused by progressive loss of confidence by the patients which tend to prefer passive and faster solutions. Many interventions on facet and sacroiliac joints and intervertebral disks have proven to be effective in reducing pain when appropriate indications are respected. Object of this uncontrolled study was to test an integrated treatment between pain management and kinesiotherapy settings aimed to have a successful "pain-free exercise therapy" with stable results. **Materials and methods.** 35 outpatients were studied according to these inclusion criteria: persistent or recurrent non radicular low back pain with VAS greater than 6, with functional disability, lasting for more than 6 months, few or no results from or inability to tolerate pharmacological or physical therapy. Main outcome measures were VAS for pain and Oswestry Low Back Pain Disability scale. Pain management interventions were directed on facet and sacroiliac joints and intervertebral disks with injections and/or pulsed radiofrequency. Exercise therapy interventions were aimed to restore static and dynamic mechanisms of the spine and to patient education on back care and self care. Collected data were statistically analyzed with analysis of variance for repeated measures. **Results.** After pain therapy 26 subjects experienced a mean VAS reduction of 62.6%, 6 of them having complete disappearance of pain. After 10 to 15 treatments of exercise therapy 5 more patients showed a VAS reduction greater than 50%. At 9 months follow up results were unchanged. **Conclusion.** The association of pain management techniques and exercise therapy is useful in treating severe chronic low back pain with very good patient compliance.

The impact of spinal cord lesions on quality of life

M. Micha, A. Mathiopoulos, K. Petropoulou

B¹ Department of Physical Medicine & Rehabilitation, Athens, Greece

Introduction. To assess health-related quality of life (HRQL) in Greek patients suffering from spinal cord injury/lesion and to identify factors associated with it. **Materials and methods.** A perspective study of HRQL in 27 patients with spinal cord lesion (16 traumatic and 11 pathologic) using SF-36 and EQ-5D questionnaires. Barthel index was used for the evaluation of activities of daily living (ADL). Demographics and clinical characteristics of the patients were also recorded. **Results.** Mean age of patients: 48.3±20.5 years, mean duration of disease: 11.0±10.2 years. 85.2% had neurogenic bladder with history of recurrent urinary tract infections (UTIs) in 40.7%, 66.7% reported neuropathic pain, whereas decubitus ulcers were found in 25.9% and diabetes mellitus coexisted in 22.2%. Mean value of EQ-5D: 0.27 ± 0.47, while the mean scores on SF-36 dimensions were found low, ranging from 15.4 (physical functioning) to 63.9 (role emotional). Patients with neuropathic pain were found to have lower scores in physical functioning (p=0.017), bodily pain (p=0.001) and in EQ-5D (p=0.008). Patients with neurogenic bladder had lower scores in physical functioning (p=0.026) and Barthel index (p=0.019). Lower values in physical functioning (p=0.026), vitality (p=0.004) and role emotional (p=0.043) were found in subjects with decubitus ulcers. Prematurely retired patients reported significantly lower scores in role emotional (p=0.043). Even lower scores were reported by subjects with diabetes mellitus, in dimensions of bodily pain (p=0.030), vitality (p=0.033) and Mental Component Summary (MCS) (p=0.043). Significant correlations were found between Barthel index and Physical Component Summary (PCS) (r=0.47, p=0.013) and EQ-5D (r=0.55, p=0.003). **Conclusion.** HRQL was found significantly low in patients with spinal cord lesion and the factors associated with it have to be detected and modified by the rehabilitation specialist.

Can "adapted physical activity" improve mobility, function, and quality of life in stroke patients after rehabilitation? The efg-et project assessing the feasibility and efficacy of a strategy based on group exercise program and therapeutic patient education

M. Taricco¹, E. Bassi¹, C. Bernucci¹, S. Borghi², G. Camurri², E. Carretta³, E. Cavalli¹, M. Cotti¹, L. Dall'olio³, A. Di Gioia¹, A. Foresti¹, S. Fugazzaro², N. Gaudenzi¹, B. Kopliku¹, V. Manigrasso¹, V. Marchionni¹, M. Morara¹, M.L. Neri¹, B. Piccinelli², P. Pillastrini¹, V. Stigliano²

¹Azienda Ospedaliero-Universitaria S. Orsola Malpighi di Bologna

²Azienda Ospedaliera S. Maria Nuova di Reggio Emilia

³Dipartimento di Medicina e Sanità Pubblica Università di Bologna

Introduction. After rehabilitation stroke survivors develop sedentary lifestyle associated with limitations in mobility. Due to the reduction of physical fitness and mobility, depression and social isolation, they are at greater cardiovascular risk. Despite good evidence links exercise to improved cardiovascular health, functioning and quality of life in various chronic diseases, there is limited experience of the impact of exercise programs in stroke patients. **Objective.** To assess whether a Group Adaptive Physical Exercise program (EFG), associated to Therapeutic Patient Education (ET), improves function and quality of life in stroke patients with disability after rehabilitation. **Materials and methods.** *Study Design* Prospective cohort study with non randomised concurrent controls *Participants* 300 stroke patients after rehabilitation (at 3 to 18 months from the index event): 150 consecutive patients will enter the *active group* (Bologna) and 150 the *control group* (Reggio Emilia). *Intervention* The experimental intervention includes sixteen 1-hour EFG exercise sessions delivered twice a week together with 4 ET sessions. The control group receives only usual care (i.e. standard advice and counselling to maintain physical activity). *Outcome measures* Gait speed (6-Minute Walking Test), balance (Berg Balance Scale), motricity and function (Motricity Index, Short Physical Performance Battery), ADL (Modified Barthel Index), quality of life (SF 12, Geriatric Depression Scale, Caregivers Strain Index) measured at baseline, 4 and 12 months after study inclusion. **Preliminary results.** So far we enrolled 42 patients in the active group and 11 patients in the control group. Comparisons between groups revealed no differences on gender, mean age and level of education. All patients in the active group started EFG and ET sessions. No adverse events were reported.

References

Macko RF, Benvenuti F et al. Adaptive physical activity improves mobility function and quality of life in chronic hemiparesis. *Journal of Rehab Research & Devel* 2008;45:323-328

Minimal data set for stroke patients (protocollo di mini-ma per ictus cerebrale - PMCI): local implementation for the complex care of stroke patients

M. Taricco¹, E. Zardi¹, M. Bettoni¹, C. Bernucci¹, E. Cavalli¹, A. Gazzotti¹, A. Di Gioia¹, P. Graziani¹, V. Marchionni¹, B. Miccoli¹, L. Favero²

¹UO Medicina Fisica e Riabilitazione, Azienda Ospedaliero-Universitaria S. Orsola Malpighi di Bologna

²Ufficio Ricerca Innovazione e Governo Clinico, Azienda Ospedaliero-Universitaria S. Orsola Malpighi di Bologna

Introduction. The use of outcome measures in rehabilitation setting is becoming more frequent due to the increasing need of documenting therapeutic results. The minimal data set protocol for stroke patients (PMCI) has been created to provide the rehabilitative team with a simple, reliable and exhaustive assessment tool. **Materials and methods.** A working group was created with the specific aim to implement the use of PMCI as a routine tool for the "Stroke Pathway" at our department. Particular attention was paid to train health professional to use the scale specifically the Canadian Neurological Scale, Trunk control Test, Barthel Index, and Rankin Scale. Some flow charts were provided for the longitudinal evaluation that starts during the "acute phase" in Stroke Care Unit, followed by the "rehabilitative phase" in the Intensive Rehabilitation Unit. The PMCI is filled by all team components with the exception of the "outpatient phase" that is under physiatrist's responsibility. **Results.** Data concerning 560 stroke patients treated on 2007-2008 will be presented. Four hundred twenty-five patients have been evaluated with the PMCI in the acute phase (within 72 hours), 145 have been evaluated at both the beginning and at discharge to the rehabilitative phase. The protocol's limits and positive aspects of PMCI will be discussed. **Conclusion.** The PMCI proven to be a useful tool to : 1) guarantee a reliable evaluation of patient health status, 2) contribute to better continuity of care, 3) reduce variation in patterns of care among health services dedicated to stroke patients.

References

Miceli G, Cavallini A et al Organizzazioni sanitarie, reti e registri. Verso una data banca dati italiana. Oral presentation to "Stroke 2005", Firenze, 13-15 marzo 2005.

European Stroke Initiative Recommendations for Stroke Management- Update 2003. *Cerebrovasc Dis* 2003; 16: 311-337.

Characteristics and usefulness of the “modified” barthel index (BIM) in the rehabilitation setting : a shared team experience

M. Taricco¹, G. Alberti², E. Andreoli¹, N. Cantafora¹, A. Foresti¹, A. Gazzotti¹, M. Menarini¹, B. Miccoli¹, E. Monti¹, E. Zardi¹, E. Arcangeli¹, F. Bianconcini¹, S. De Franceschi¹, C. Boldri¹, A. Amadori¹, B. Brighi¹, C. Russillo¹, L. Balbi¹, B. Pasquali¹, P. Accetta¹, V. Franchini¹, L. Favero³

¹U.O. Medicina Fisica e Riabilitazione, Azienda Ospedaliero-Universitaria S. Orsola Malpighi Bologna

²Istituto INPDAP Novara

³Ufficio Ricerca Innovazione e Governo Clinico, Azienda Ospedaliero-Universitaria S. Orsola Malpighi di Bologna

Introduction. During the last years, the worldwide application of the 5 level Shah version of the Barthel Index (Modified-Barthel Index - BIM) to evaluate the disability of different patient populations, has increased. This is due to the demonstrated better performance of BIM in terms of discriminative ability and sensitivity to change, versus the original Barthel Index. Sharing an evaluation tools by a multi-professional team can improve inter professional communication and enhance the possibility of setting more focused therapeutic goals. **Materials and methods.** A working group of physiatrists, physiotherapists and nurses agreed to include the BIM in their clinical practice. An explicit protocol was elaborated with an instruction booklet defining how to use BIM, how to distribute professionals' evaluation domain, how to share results during the team meetings and how to provide meaningful feedback of the evaluation. **Results.** Data on 794 patients will be presented: 54% with neurological disease, 32% with orthopedic disease, 14% with amputations and prolonged immobility syndrome. All patients experienced a great functional improvement (with a mean score of 45/100 and 70/100 at admission and discharge, respectively). The average daily BIM improvement is highest in the orthopedic patients (1.21 /day), followed by neurological patients (0.70), and those with amputation (0.48). For neurological patients the results confirm the literature data indicating greater complexity for hemorrhagic stroke (initial BIM 27.7 and length of stay of 42.4 days) compared to ischemic stroke (initial BIM 36.9 and length of stay of 28.1 days). **Conclusion.** We confirm the usefulness of BIM as monitoring tool for measuring the case mix, analyze the burden of care and patient needs, improve the inter professional communication.

References

S. Shah, F. Vancly and B. Cooper Improving the sensitivity of Barthel Index for stroke rehabilitation Clinical Epidemiology 1989 42 n°8 703-709

How do individuals with spinal cord injury choose activities? A Qualitative study based on a phenomenological hermeneutic method

D. Van de Velde¹, P. Bracke², G. Van Hove³, S. Josephsson⁴, G. Vanderstraeten⁵

¹Department of Rehabilitation Sciences and Physiotherapy, Ghent University, Belgium

²Faculty of Political and Social Sciences, Ghent University, Belgium

³Faculty of Psychology and Educational Sciences, Ghent University, Belgium

⁴Division of Occupational Therapy, Department of Neurotec, Karolinska Institutet, Stockholm, Sweden,

⁵Department of Physical and Rehabilitation Medicine, University Hospital Ghent, Belgium

Introduction. Although life expectancy of individuals with Spinal Cord Injury (SCI) remains below normal it continues to increase substantially. The increasing life expectancy after SCI has given “participation”, as defined within the International Classification of Functioning, disability and health (ICF), a new recognition as an ultimate goal of a comprehensive rehabilitation program¹. Research has shown that participation in a variety of activities positively affects health and wellbeing². An important aspect in this discourse is whether the individual has the opportunity to choose preferred activities. **Materials and methods.** This study employed a qualitative research design. 28 in-depth interviews were conducted with 12 SCI patients to elicit individual's narratives about their activity choices. The participants were selected using homogeneous sampling. Data were analyzed according to a phenomenological hermeneutic method. **Results.** The findings revealed that activities are chosen in a continuum between the individual's (a) identity and (b) the influence from his/her environment. In this continuum the choice to

perform activities is influenced by two mediating factors; (a) the individual's life-(hi)story and (b) his/her occupational challenge for the future. **Conclusion.** Individuals with SCI are in constant consideration which activities to choose. Their sense-making is an internal process of negotiation and appeared to be based on finding balance between their own identity and the expectations from the environment. Individuals experience a sense of occupational justice by having the opportunity to choose activities in this continuum; taking their life-history and their occupational challenges into consideration in the decision making process.

References

1. Stucki G, Ewert T, Cieza A. Value and application of the ICF in rehabilitation and medicine. Disability and Rehabilitation 2003;25:628-634
2. Noreau L, Fougereyrolas P. Long-term consequences of spinal cord injury on social participation: the occurrence of handicap situations. Disabil Rehabil 2000;22:170-180

Pelvic region electrical neuromuscular stimulation reduces urinary incontinence in the elderly

F. Palermo

University of Nevada, Reno

Introduction. Urinary incontinence in the elderly is pervasive. Anti-cholinergic medications have significant side effects. Pelvic floor exercises are difficult for geriatric patients. Gentle stimulation to the abdominal and inner thigh muscles reduces incontinence and is well tolerated by elderly and MS patients. Patterned electrical neuromuscular stimulation (PENS) enhances 1a reciprocal inhibition. Stimulation to the somatic nerves entering the level of the sympathetic inferior hypogastric complex may reduce hypersensitivity of bladder stretch receptors, thus reducing urgency. **Materials and methods.** Case report series. Incontinence episodes recorded pre and post treatment utilizing 7-day bladder diaries. PENS performed by applying 3” x 5” surface electrodes to T10-T12 and L1-L2 dermatomes and muscles. Stimulation sequenced 200mSec from abdominal to thigh muscles repeating every 1.5Sec for 20 minutes. Intensity: gentle muscle contractions. Average treatments 27(7-12 weeks). **Outcome measures.** Number of incontinence episodes per day, long-term sustained effect, tolerance of stimulation. **Results.** Average Incontinence episodes pre: 7.6 (range 3-15) post: 2.0 (range 0-11). Number reducing incontinence > 50%: 34 of 42 (82%). Follow-up at 4 weeks: no change from post-treatment. 12 week F/U: 6 of 34(18%) increased incontinence but improved with 3-6 additional treatments. Stimulation Tolerance: 39/42 tolerated the intensity well. **Conclusion.** PENS therapy was well tolerated and reduced urinary incontinence episodes within this population of elderly women. Many geriatric patients are unable to perform pelvic floor exercises correctly but had no difficulty with external stimulation. Similar beneficial effects were noted in 6 MS patients.

References

- de Groat, WC Integrative control of the lower urinary tract: preclinical perspective. Br J Pharmacol. 2006 Feb; 147 Suppl 2:S25-40
- Castel, JC, Patterned electrical stimulation decreases the incidence of incontinence in elderly patients, Showa Univ J Med Sci Sept 2004
- Perez MA, et al .Patterned sensory stimulation induces plasticity in reciprocal 1a inhibition in humans. J Neurosci. 2003 Mar 15

Paralytic lagophthalmus in seventh nerve palsy: new treatment options for lid and lacrimal rehabilitation

A.L. Giacomini¹, D. Primon²

¹U.O.A. Oculistica Az ulss 15 “Alta Padovana” (PD)

²Physical and Rehabilitation Medicine Department, Az. Ulss 15 “Alta Padovana”

Introduction. Seventh nerve palsy and secondary paralytic lagophthalmus can be a transitional and reversible event or a permanent and irreversible damage for the eye. In the event of temporary paresis frequently induced by virus, the management is less invasive and aimed to stimulate a slow restore of lid functionality. In the event of trauma, tumour, central nervous system diseases and neonatal pathologies, facial palsy may continue and become a chronic disease with serious consequences to the cornea and the sight. Lagophthalmus management depends on reduction of lid closure; depending on the level of corneal exposure many are the medical and surgical procedures that must be applied to prevent the appearance of corneal lesions. Corneal sensibility evaluation and facial

electromyography are the most useful test performed in the management of this pathology. The E.M.G. addresses neurological rehabilitation and guides the timing performing lid surgery rehabilitation and secondary neurotrophic keratopathy management to improve visual acuity. **Materials and methods.** A 40 eyes series affected by seventh nerve palsy is evaluated with regards to visual acuity result after using autologous serum eye-drops (ASE) to improve dry eye and secondary neurotrophic keratopathy after rehabilitation surgery, compared with the use of conventional artificial tears therapy. In central 7th nerve palsy, after recovery of tears production, if complete lids closure wasn't obtained by surgery rehabilitation, high permeability soft contact lenses were applied in the eyes to keep lachrymal fluid on the cornea. **Conclusion.** Paralytic lagophthalmus secondary to facial nerve palsy is a possible condition in neurological patients treated in physical and rehabilitation medicine settings: new techniques are now available to prevent corneal lesions and to restore binocular visual function and, when needed, should be part of a comprehensive rehabilitation project.

Critical points on neglect treatment with prismatic goggles

M. Mancuso¹, M. Pacini¹, P. Gemignani², B. Bartalini³, L. Ferroni⁴, M. Caputo⁵, D. Capitani⁶, E. Mondin⁷, A. Cantagallo⁷

¹UO Riabilitazione Neurologica, Az. USL 9 Grosseto

²Fondazione Don Gnocchi, Sarzana

³UORRF, Az. USL Viareggio

⁴UORRF, Az. USL Lucca

⁵Auxilium Vitae-Volterra

⁶UO Sistema Informativo, Az.USL9 Grosseto

⁷Modulo di Neuropsicologia Riabilitativa, UOMR, Dipartimento di Neuroscienze/Riabilitazione, Ospedale ed Università di Ferrara, Italy

Introduction. After right hemisphere stroke a large number of patients tend to ignore or fail to respond to stimuli in the contralateral side of space. In 1998 Rossetti et al. highlighted a new rehabilitation procedure, using goggles to induce a deviation of the visual field toward the right. Neglect can be improved after a short period of adaptation to a prismatic shift of the visual field to the right. The aim of this study was to compare the effect of a treatment based on repeatedly pointing at a visual target with the right index finger (pointing exercise) while wearing prismatic lenses which shifted visual field 5° rightward, with pointing exercise wearing neutral lenses. **Materials and methods.** Twenty-nine neglect patients were divided into 2 matched groups, one was treated with pointing exercises wearing prismatic goggles and one with pointing exercises wearing neutral goggles. All patients were assessed with the Mini Mental Test Examination and clinical evaluation for hemianopsia. Neglect was assessed before and after treatment with Bell Cancellation Test (Gauthier et al., 1989), Line Bisection Test (Albert, 1973), Behavioural Inattention Test (Wilson et al., 1987). **Results.** All patients showed a significant improvement after pointing treatment with or without prismatic goggles in Bell Cancellation Test, and Behavioural Inattention Test, but not in Line Bisection Test. **Conclusion.** We conclude that while pointing exercises can improve neglect symptoms, prismatic goggles which shift visual field 5° rightward cannot improve neglect symptoms.

References

Albert ML. A simple test for visual neglect. *Neurology* 1973; 23: 658-664.
 Farnè A, Rossetti Y, Toniolo S, Ladavas E. Ameliorating neglect with prism adaptation: visuo-manual and visuo-verbal measures. *Neuropsychologia* 2002; 40: 718-729.
 Gauthier L, Dehaut F, Joannette Y. The Bells test: a quantitative and qualitative

Sensory-motor integration during standing spatial rotational task in children with cerebral palsy

M. Petrarca¹, G. Zanelli², F. Patané², P. Cappa^{1,2}, E. Castelli¹, A. Berthoz³

¹"Bambino Gesù" Children's Hospital, Department of Neurosciences and Neurorehabilitation, Rome, Italy.

²"Sapienza" University of Rome, Department of Mechanics and Aeronautics, Rome, Italy.

³Laboratoire de Physiologie de la Perception et de l'Action, Collège de France, Paris, France.

Introduction. It is known that spatial rotational orientation is visually guided, while, when visual information is denied, vestibular and proprioceptive information induced errors that are differently correlated with the task [1]. It is also known that patient with unila-

teral vestibular loss showed a drift towards the affected side[2]. It is less studied how visual, vestibular and proprioceptive information is integrated during sensory-motor task in children with cerebral palsy that usually show asymmetric motor deficit. **Materials and methods.** 15 children with cerebral palsy (mean age 8±2), with no cognitive or visual deficit, and 6 healthy children (mean age 6±1) were asked, after rotational displacement induced by motorized rotating platform with eyes closed, to recognize rotational perturbation indicating at the starting position and to reproduce rotation stepping in place. Six rotation amplitudes (±90°, ±180°, ±360°), at constant angular velocity (57°/s) were tested. The angles administration were randomized and repeated four time each. 3D kinematic was collected with eight cameras optoelectronic system (Vicon MX). **Results.** Healthy children was able to perceive and to reproduce correctly all the rotational perturbations (p<0.001) although, they overestimate all inputs with no statistical significance. In children with cerebral palsy the results was grouped respect to the rotation towards the more or the less affected side. In comparison with healthy subjects they underestimate and over reproduced contra lateral rotation (p<0.05). While, during ipsi lateral rotation they overestimate and under reproduced rotational angles (p<0.05). **Conclusion.** The proprioceptive information during active rotation was not sufficient to correct the asymmetry of vestibular perception during passive rotation in CP. Visual feedback had to be preferred, alternating with proprioceptive training.

References

1. Zanelli G. et al. Gait&Posture in Press.
 2. Liliane Borel et al. (2004) Behavioural Brain Research 150;191–200.

Kinematic and Kinetic characteristics of planar reaching during robotized training in children with brain injury

M. Petrarca¹, S. Rossi¹, F. Patané², E. Castelli¹, P. Cappa^{1,2}

¹"Bambino Gesù" Children's Hospital, Department of Neurosciences and Neurorehabilitation, Rome, Italy.

²"Sapienza" University of Rome, Department of Mechanics and Aeronautics, Rome, Italy.

Introduction. The efficacy of reaching training conducted with end point robotic manipulandum in adults and in children with brain injury was assessed respect to the improvement of both smoothness and functional movements [1, 2]. However, during robotized training, kinematic and kinetic characteristics of upper limb joint coordination was not assessed in children with brain injury. **Materials and methods.** 12 children with brain injury (mean age 13±2), with no cognitive or visual deficit, received 20 days of assistive planar robotic training with Inmotion2 apparatus. Reaching characteristics on 5 healthy children (mean age 8±2) was also assessed in one day session on the same apparatus. 3D kinematic was collected with six cameras optoelectronic system (Vicon 512). Kinetic was assessed by mean of a three axes force sensor mounted on the base of robotic manipulandum. **Results.** Kinematic: trajectory smoothness was higher in healthy children than children with brain injury (p<0.05) that improved during therapy (p<0.05). Inter-joint coordination showed synchronization in movement inversion in all subjects. Kinetic: force sensor revealed no forces on healthy children, while, in children with brain injury, planar forces reduced during therapy, and, vertical forces increased in downward direction (from -75±20N to -81±19N, p<0.05). **Conclusion.** Although, the improvement of smoothness was assessed in children with brain injury, inter-joint synchronic co variation and the increase of pathologic vertical force evidenced the influence of task constrains during assistive planar reaching training. A deep analysis of reaching characteristics in relation with task and context is necessary in order to exclude the adoption of opportunistic, task-dependent motor solutions in children with brain injury.

References

1. Shadmehr R, Mussa-Ivaldi FA. 1994 *J Neurosci* ;14(5 Pt 2):3208-24.
 2. Frascarelli F et al, 2009 *Eur J Phys Rehabil Med*; 45:135-41.

Personality changes after ISPC (Iowa Scales of Personality Change)

A. Cantagallo¹, E. Contini¹, A. Bianchi²

¹Modulo di Neuropsicologia Riabilitativa, UOMR, Dipartimento di Neuroscienze/Riabilitazione, Ospedale ed Università di Ferrara, Italy

²AUSL di Arezzo, Italy

Introduction. The purpose of this study was to determine firstly, whether the ISPC (Iowa Scales of Personality Change) is a valid instrument to rate personality change after frontal brain injury, and secondly, to determine the existence of a possible correlation between personality change and cognitive impairment. **Materials and methods.** The Italian adaptation of the ISPC is composed of 30 clinical scales that assess changes in the expression of emotion, the organisation of behaviour, decision making, interpersonal relation and capacity of introspection after brain injury. Each scale has two scores on 3 severity points (0-3): one that identifies the actual condition (post-morbid), and the other which identifies the condition before the traumatic event. The scales are completed by the patient's relatives. ISPC and NPI were administered (Neuropsychiatric Inventory) to the relatives of 20 patients with frontal brain injury, and to the relatives of 20 control subjects (with limb fracture or spinal cord injury). The protocol for the evaluation of patients also included a global autonomy scale and neuropsychological assessment for attention, long-term memory and executive functions. **Results.** The results showed that the change in patient personality was significant in almost all clinical scales ($p < 0.05$) except for features such as obsessiveness, inability to relax (A type behaviour), emotional flattening, social withdrawal, suspiciousness, frugality and emotional inappropriateness. The results of the control subjects showed that the personality change was not significant except for the characteristic of emotional expression (lack of initiative, depression, lability of mood and lack of strength / energy). The NPI scale showed that there was a significant difference between the symptoms that occurred in patients and controls in almost all items. It was also shown that there was no significant correlation between personality and behaviour change (ISPC and NPI), decline in cognitive functions and functional autonomy. **Conclusion.** Personality changes in frontal head injury patients influence integration into the community and need particular attention in the rehabilitation process.

Rasch analysis as a validation tool for conceptual models: development and analysis of internal constructive validity of a new scale based on the levels of cognitive functioning (LCF)

A. Cantagallo¹, F. La Porta².

¹Modulo di Neuropsicologia Riabilitativa, UOMR, Dipartimento di Neuroscienze/Riabilitazione, Ospedale ed Università di Ferrara (Italy)

²Rehabilitation Unit, Nuovo Ospedale Civile di Modena (Italy)

Introduction. LCF (Levels of Cognitive Functioning¹) is a scale describing the progressive recovery of cognitive and communication abilities along an ideal continuum ranging from coma to community. Despite its widespread usage in brain injury rehabilitation, there is little if any published evidence on its validity. Aim of this study was to test the validity of LCF by testing its measurement properties by the mean of Rasch Analysis (RA). **Materials and methods.** After the content analysis of the 10-level LCF scale, 16 concepts were identified and transformed in as many items by devising an appropriate scoring using the LCF structure as a guideline. Thus a new scale called "New LCF" (NLCF) was developed. NLCF was then administered to a sample of 160 subjects with severe brain injury in various recovery stages. The following requirements were checked within RA: correct ordering of response options, local independence, absence of DIF, unidimensionality and invariance. External validity was also tested by correlating NLCF measures with LCF and cognitive FIM. **Results.** After rescaling nine items a final solution fitting with the Rasch Model was obtained. The final scale had a wide measurement range (18 logits) and an excellent reliability (PSI=0.973), allowing to separate reliably 9 groups of patients (strata). High correlations were demonstrated between NLCF and both LCF and cognitive FIM ($\rho=0.95$, $p < 0.01$, and respectively, $\rho=0.93$, $p < 0.01$). **Conclusion.** These results not only support the validity of NLCF as a cognitive measure in brain-injured patients, but also support the conceptual validity of the LCF as a model of recovering cognitive and communicative deficits after severe brain injury. Implications of these findings are discussed.

References

- Gouvier WD et al: Reliability and validity of the DRS and the LCF in Monitoring Recovery from severe head injury, Arch of Phys Med Rehab (1987); 94-97.

Use of botulinum toxin type A in patients with hereditary spastic paraplegia (HSP), review of 5 cases

Y. Ivánovic-Barbeito, S. Martínez

Centro de referencia estatal de atención a personas con enfermedades raras y sus familias. IMSERSO (State reference center for people with rare diseases and their families. IMSERSO), Burgos, Spain

Introduction. Hereditary spastic paraplegia (HSP) is characterized by lower extremity dynamic spasticity. Because of the results in other kinds of spasticity, the use of botulinum neurotoxin type A might also be considered for patients with HSP. We evaluate the objective and subjective improvement of patients by injecting botulinum toxin, analyzing the progress and ability to ambulate on uneven surfaces after a gait rehabilitation treatment, giving guidelines of gait rehabilitation standardized by the MD. **Materials and methods.** We consider the following Facts: Tinetti scale of gait before and after treatment (botulinum toxin and 5 months and 2 sessions of physiotherapy per week. 20 minutes of the session are dedicated to muscle elongation and 40 minutes are dedicated to gait rehabilitation). The evaluation also checks: time that patient takes to walk 10 meters and step length, before and after treatment. **Results.** After botulinum toxin injection of the gracilis and adductor and completing the rehabilitation treatment, time to travel the distance was reduced by almost half (45%) in all cases and step length was increased over 25%. Tinetti scale was improved in 3 points in all cases. **Conclusion.** Botulinum toxin is useful in the management of dynamic spasticity of HSP, requiring also a proper gait re-education for periods of several months.

References

- Braschinsky M, Parts K, Maamägi H, Gross-Paju K, Haldre S. Functional Assessment of Lower Extremities in Hereditary Spastic Paraplegia Archives of Physical Medicine and Rehabilitation, Volume 90, Issue 11, Pages 1887-1890
- Martin J. Hecht, Henning Stolze, Matthias Auf Dem Brinke, Ralf Giess, Botulinum neurotoxin type A injections reduce spasticity in mild to moderate hereditary spastic paraplegia - Report of 19 cases Movement Disorders Vol. 23 Issue 2, 2007, Pages 228-233.

Therapeutic options in focal dystonia in musicians (pianists). Treatment over 1 year and 10 patients

Y. Ivánovic-Barbeito, C. Cop

Centro de referencia estatal de atención a personas con enfermedades raras y sus familias. IMSERSO (State reference center for people with rare diseases and their families. IMSERSO), Burgos, Spain

Introduction. Focal dystonia in musicians is a rare but invalidating condition that may lead to abandon the career to the musician who suffers it. In the absence of standards and lack of treatment of this condition in musicians, a therapeutic option and procedure is very important. **Materials and methods.** We evaluated this condition in patients who are professional musicians, pianists, with typical dystonia of adductor pollicis and have the diagnosed of focal dystonia in relation to their artistic activity, they may have received at least one injection of botulinum toxin in last 2 years. The parameters for assessing the effectiveness are the implementation of 3 scales and arpeggios in a row in the key of C, E and A flat, and evaluating the dystonic feeling control. Kinesitherapy was worked at the keyboard for a specific exercises, written taking special care of the decomposition of effects of unwanted co-contraction by agonist and antagonist muscles. All professionals were working the same program of exercises, at 1 hour a day. Treatment is evaluated at the beginning and annually. **Results.** 7 of them went positively through the evaluation, while 1 did not improve at all, one retrogress and one abandoned treatment. **Conclusion.** It is a small series to evaluate the treatment, and we will expand number of patients -due to difficulties of finding patients-, but it is encouraging that 5 patients achieved complete re-employment on their career.

References

- A Primate Model for Studying Focal Dystonia and Repetitive Strain Injury: Effects on the Primary Somatosensory Cortex. Nancy N Byl, Michael M Merzenich. Phys Ther Vol. 77, No. 3, March 1997, pp. 269-284
- Effective behavioral treatment of focal hand dystonia in musicians alters somatosensory cortical organization. Victor Candia, Christian Wienbruch. PNAS June 24, 2003 vol. 100 no. 13 7942-7946.

Rehabilitation and orthoses in a case of upper limb replant

T. Iacomussi¹, F. Bergamin², P. Toro¹, G. D'Urso¹

¹S.C. Medicina Fisica e Riabilitazione ASL TO2 Torino, Italy

²S.C. Chirurgia Plastica- Chirurgia Mano, ASL TO2 Torino, Italy

Introduction. The reconstruction of a limb amputee through his replanting may grant the patient a quality of life that the most sophisticated implants can offer. But the reconstruction of a limb amputee by replanting must face complex problem, to the immediate post-operative rehabilitation and involving interdisciplinary consistently than therapeutic strategies ahead of the evolution of recovery. Our experience refers to the complexity of therapeutic, rehabilitative and orthotic in a case of right upper limb replant the 3rd proximal arm. **Materials and methods.** Man 65 years old, farmer, undergoing orthopedic and plastic surgery to replant right arm amputee by a threshing machine. Complex and progressive rehabilitative research and recovery of joint mobility, skills assessment and recovery of functional orthotic correction of postures flawed, using dynamic splint functional recovery, assessment of peripheral neurological damage, use of electrodiagnosis and electrotherapy stimulation. **Results.** The patient was followed from March 1, 2007 to date, the functional recovery of the upper allows the whole a fair use in ADL, were tailored to the brace position by exploiting the mobility of the first distal finger especially the decline of the thumb and index allow an outlet for functional activities such as writing. **Conclusion.** The success of a relocation of a limb improves quality of life and psychological disposition of patients with large textures from amputation. The complexity of rehabilitation is derived from the assessment of impairment of all anatomical structures and the search for a functional purpose seconds the evolution of damage and knowledge of the application of orthoses which may facilitate the task.

References

- Gulgonen A. "indicazioni e risultati a lungo termine dei macroimpianti delle estremità superiori". Riv.Chir.Mano 1999;36 (2/3):125/9
B.Battiston, P.Tos,S.Ferrero, L. Conforti. "Complicazioni ed insuccessi nei reimpianti". Riv Chir.Mano Vol(38)2 2001

Case study of patients attended in a rehabilitation polyclinic

K.V. Méndez-Saavedra, I. Barca-Fernández, C. Cuenca-González, I. Flores-Torres, M. Archanco-Olcese, C. Hernández De la Peña

Physical Medicine and Rehabilitation Department. Clinico San Carlos Hospital. Madrid, Spain.

Introduction. Patients attended for the first time in our medical office have varied pathology. Many are cared and treated after first clinical evaluation. Other group require follow-up in primary care centers and the rest are referred to our specialized rehabilitation consults. **Materials and methods.** Descriptive cross sectional study 251 patients enrolled were referred to rehabilitation. Data collected during may and june of 2009. Each person had an appointment in our agenda of general rehabilitation. They came from the first level of care and from another departments of our Hospital. Variables: age, sex, pathology, rehabilitation treatment and pharmacotherapy. Statistical analysis SPSS version 9.0. **Results.** 167 women, 81 men. The median age is 58. (+ - 16.7). We observed the following diseases: traumatic pathology without fracture (32.3%), fractures (24.3%), degenerative disorders (16.7%), related to spine (13.5%), neurological impairment (3.6%), lymphedema, respiratory disease and rheumatic disorders (1.6%) and dysphonia (1.2%). 19.9% had no criteria for medical treatment and 25.9% were referred to the first level of care. Prescribed rehabilitation treatment: electrotherapy and kinesitherapy (12.7%), combination of both (11.2%), hydrokinesitherapy (5.6%), home program rehabilitation (2.4%), occupational therapy (2%), lymphatic drainage (1.6%) and speech therapy (1.2%). Pharmacological treatment: none (49.4%), analgesia first step according to who's analgesic Ladder (19.9%), analgesia second step (12.4%), adjuvants (7.6%), chondroitin sulphate supplements (6.8%). **Conclusion.** In our study, musculoskeletal and joint disorders are the most usual entities observed. Patients needing follow-up in specific rehabilitation units are few instead a large number do not need specific treatment, therefore this patients are referred to the first level of care.

References

- N Calcerrada-Diaz Santos a, et al. Sistema de clasificación de patologías en Rehabilitación en pacientes ambulatorios. Rehabilitación (Madr). 2006;40:180-7.
J.A. Expósito Tirado. M.E. et al. Indicadores de calidad asistencial en rehabilitación. Rehabilitación (Madr). 2009;43:131-7.

Management of generalized spasticity in multiple sclerosis with intrathecal baclofen pump (IBP)

M. Micha, C.A. Rapidi, G. Siamos, P. Manthos, S. Kaligerou, E. Bikaki, N. Lykoudi, K. Petropoulou

B' Department of Physical Medicine & Rehabilitation, Athens, Greece

Aim. To accentuate the effectiveness of IBP for management of generalized spasticity in patients with multiple sclerosis (MS) and its use for advanced rehabilitation program. **Materials and methods.** A retrospective study of 12 patients (6 male) with severe spasticity due to MS, with clinical picture of paraplegia in 5 patients and tetraplegia in 7. The total number of patients with IBP followed-up in our department since 2004 are 42. The mean age of the sample was 49 years, the mean duration of disease was 16 years, the mean time of follow-up since implantation was 6 years and the daily baclofen dose was 222 µg/day. 6 patients had a programmable pump implanted and 6 had a continuous pump. The main reasons of implantation: better positioning in bed, standing frame and wheelchair, facilitation of nursing care, performance of intermittent catheterizations (IC), facilitation of orthotic wear, prevention of decubitus ulcers and pain alleviation. **Results.** Out of 12 patients, 7 reported significant pain alleviation after implantation, 11 improvement of range of motion, 8 improvement of sleep quality, 8 unmasking of voluntary movement, 12 facilitation of performance of IC and 12 improvement of posture in wheelchair. The proper time of implantation and the daily dose depend absolutely on short- and long-term goals of rehabilitation. **Conclusion.** The implantation of IBP in patients with MS contributes considerably in accomplishment of goals of rehabilitation. Neuromodulation and spasticity management is of primary importance for effective rehabilitation program to achieve maximum functional capacity.

Multiple sclerosis and osteoporosis in female patients

M. Micha, P. Kokkonis, A. Papachristos, A. Tsivgoulis, E. Bikaki, N. Likoudi, K. Petropoulou

2nd Department of Physical Medicine and Rehabilitation, National Rehabilitation Center, Athens, Greece

Objective. To assess the frequency of osteoporosis in female patients with multiple sclerosis (MS) and to identify associated risk factors. **Materials and methods.** Thirty-nine MS female patients admitted to our department since 2004 were retrospectively studied; mean age: 48 years and mean duration of disease: 15 years. Clinical examination and laboratory tests were performed to exclude secondary osteoporosis. Dietary habits, menstruation history, functional capacity and presence of fatigue were recorded. Bone mineral density (BMD) measurement using DEXA (Norland) was performed, either in the lumbar spine or the femoral neck based on clinical indications. **Results.** Out of 39 patients, 13 (33.33%) were found with osteoporosis and 13 with osteopenia (33.33%). Out of 26 patients with abnormal BMD, 11 were under corticosteroids, whereas data was missing regarding steroids use for 6 of them; 12 (44.44%) were wheelchair users and 14 (51.85%) were able to walk in a therapeutic mode with or without orthoses for short distances. Only 5 (19%) of the patients who were found with osteoporosis /osteopenia had already been investigated with BMD measurement elsewhere. Osteoporosis/ osteopenia was recorded in a significant percentage (66.66%) in women with multiple sclerosis, regardless of young age and presence of menstruation in 38.4%. **Conclusion.** The investigation of osteoporosis in patients with multiple sclerosis is mandatory and should be included in the admission protocol of rehabilitation centers, as it will contribute to better planning of an optimal, individualized rehabilitation program and the prevention of osteoporotic fractures. Treatment with corticosteroids, restricted functional capacity and fatigue are risk factors that should always be taken into account.

A technology-assisted learning setup as assessment supplement for persons with a diagnosis of post-coma vegetative state and pervasive motor impairment

J.N. Solano¹, G.E. Lancioni², F. Buonocunto¹, V. Sacco¹, F. Colonna¹, C. Lanzilotti¹, G. Megna²

¹Fondazione San Raffaele Rehabilitation Center, Ceglie Messapica (Brindisi)

²University of Bari

Introduction. Post-coma persons in an apparent condition of vegetative state and pervasive motor impairment pose serious pro-

blems in terms of assessment and intervention options. A technology-based learning assessment procedure might serve for them as a diagnostic supplement with possible implications for rehabilitation intervention. **Materials and methods.** A learning setup was arranged for 14 persons with a reported diagnosis of vegetative state, and completed with 11 of them. Signs of learning by the patients would underline an improvement in their immediate situation with potential implications for their general prospect, and could help revise their diagnosis: from vegetative state to minimal consciousness state.

The response adopted in the learning setup were minimal movements already available in their behaviour repertoire. The microswitch technology used for detecting such responses included among others optic and pressure sensors and an electronic control system that activated stimuli in relation to the participant's responses. The study followed an ABACB sequence, in which A represented baseline periods, B intervention periods with stimuli contingent on the responses, and C a control condition with stimuli presented non-contingently. **Results.** Data for 9 of the 11 participants who completed the study sequence, showed that the level of responding during the B phases was significantly higher than the levels observed during the A phases as well as the C phase. These data indicate clear signs of learning with possible suggestion of minimal consciousness. **Conclusion.** Intervention strategies based on a learning format and suitable technology might be useful to supplement formal assessment procedures and help modify previous diagnosis of vegetative state.

References

1. Lancioni, G. E., Singh, N. N., O'Reilly, M. F., Sigafoos, J., de Tommaso, M., Megna, G., et al. (2009). A learning assessment procedure to re-evaluate three persons with a diagnosis of post-coma vegetative state and pervasive motor impairment. *Brain Injury*, 23, 154-162.

Technology-based intervention options for post-coma persons with minimally conscious state and pervasive motor disabilities

J.N. Solano¹, G.E. Lancioni², F. Buonocunto¹, V. Sacco¹, F. Colonna¹, C. Lanzilotti¹, G. Megna²

¹Fondazione San Raffaele Rehabilitation Center, Ceglie Messapica (Brindisi)

²University of Bari

Introduction. Technology-assisted programs for persons with acquired brain injury and multiple disabilities constitute an increasingly relevant objective of every organization or family contest dealing with these persons. **Materials and methods.** We assessed programs to promote constructive engagement, requests, and choice by 15 persons with pervasive motor disabilities and consciousness/communication disorders following acquired brain injury. The programs were based on learning principles and use of assisted-technology (e.g., sensors to monitor participant's responses and trigger environmental stimulation). A basic objective was the participant's acquisition of simple responses to access environmental stimulation independently. Other objectives included calling for caregiver attention and choosing between environmental stimuli. Microswitch technology was used for the basic objective; VOCA and computer technology served for the other objectives. **Results.** The results were very encouraging. The technology developed for the different objectives promoted consisting levels of constructive engagement by the participant with improvements in the level of stimulation, communication and social contact. **Conclusion.**

These findings maybe particularly relevant for daily rehabilitation programs for persons with similes levels of disabilities.

References

1. Lancioni, G. E., Singh, N. N., O'Reilly, M. F., Sigafoos, J., Buonocunto, F., Sacco, V., et al. (2009). Two persons with severe post-coma motor impairment and minimally conscious state use assistive technology to access stimulus events and social contact. *Disability and Rehabilitation: Assistive Technology*, 4, 367-372.

2. Lancioni, G. E., Olivetti Belardinelli, M., Stasolla, F., Singh, N. N., O'Reilly, M. F., Sigafoos, J., et al. (2008). Promoting engagement, requests and choice by a man with post-coma pervasive motor impairment and minimally conscious state through a technology-based program. *Journal of Developmental and Physical Disabilities*, 20, 379-388.

3. Lancioni, G. E., Singh, N. N., O'Reilly, M. F., & Oliva, D. (2005). Microswitch programs for persons with multiple disabilities: An overview of the responses adopted for microswitch activation. *Cognitive Processing*, 6, 177-188.

Effects of sacral neuromodulation on the erectile and ejaculatory function in sci patients

V. Tagliante¹, J.N. Solano¹, F. Colonna¹, G. Megna²

¹Fondazione San Raffaele Rehabilitation Center, Ceglie Messapica (Brindisi)

²University of Bari

Introduction. Over the past years several studies have shown how useful sacral neuromodulation (SNM) is in treating neurogenic bladder dysfunctions in incomplete spinal cord-injured patients. Recent studies showed clinically significant benefits for the erectile function arising from SNM in incomplete SCI patients. **Materials and methods.** 17 SCI patients underwent a preliminary PNE test (Peripheral Nerve Evaluation) by means of a temporary system. After a favourable PNE test, a permanent implantation was performed on 10 patients. Out of these 10 patients, 4 suffered from complete spinal cord injury, 6 from incomplete spinal cord injury: 1 cervical SCI, 7 dorsal SCI and 2 lombar SCI. Assessment involved pre and post-implantation erectile and ejaculatory function by using an IEEF-5 score, spontaneous ejaculatory function capacity or/and mechanical vibrostimulation ejaculation (Personal Ferticare) over a 1-year period after SNM implantation. **Results.** Pre-implantation evaluation showed: severe erectile dysfunction in 5 patients and moderate erectile dysfunction in 4 patients ; spontaneous ejaculation capacity in 1 incomplete SCI; Mechanical vibrostimulation ejaculation has in 2 incomplete SCI and 3 complete SCI. Post-implantation evaluation showed improvement of the erectile functions in 5 patient and 2 incomplete SCI patients with pre-implantation vibrostimulation ejaculation capacity recovered their spontaneous ejaculation capacity. No complete SCI patient recovered his spontaneous ejaculation capacity. **Conclusion.** Apart from clinically important benefits for the erectile function in incomplete SCI patients, sacral neuromodulation could be a tool for recovering spontaneous ejaculation capacity, although studies (a higher number of case studies) examining the ejaculation capacity in SCI patients ny means of SNM - with a larger number of case histories - would be required.

References

Giuseppe Lombardi, Nicola Mondaini, Gianluca Giubilei, Angelo Macchiarella, Filippo Lecconi and Giulio Del Popolo. Sacral Neuromodulation for Lower Urinary Tract Dysfunction and Impact on Erectile Function. *J Sex Med* 2008;5:2135-2140.

Effects of upper extremity motor recovery on gait pattern late after stroke

G. Yavuzer

Erasmus University Erasmus MC, Department of Rehabilitation Medicine, The Netherlands.

Introduction. Stroke patients exhibit varying deficits in perception, muscle strength, motor control, passive mobility, sensation, tone and balance. These impairments have significant effects upon walking ability. Although their association with hemiplegic gait have extensively studied, data regarding the effects of upper limb on gait pattern is scarce. The aim of this study was to investigate the effects of upper limb motor recovery stage on gait pattern late after stroke. **Materials and methods.** Spatio-temporal, kinematic and kinetic characteristics of gait in total of 52 patients (mean (SD) age of 60.9(12.1) years, 30 men, median time since stroke 6 months, 31 with left side paresis) with hemiparesis after stroke were retrospectively evaluated. Upper limb motor recovery was evaluated by Brunnstrom Motor Recovery Stage (BMRS) as it reflects underlying motor control based on clinical assessment of movement quality. **Results.** Median BMRS of the group was 3 (2-5). Upper limb motor recovery stage was significantly correlated with walking velocity ($\rho = 0.41$), pelvic excursions in sagittal ($\rho = -0.49$), frontal ($\rho = -0.62$) and transverse ($\rho = -0.42$) planes as well as hip flexion in swing ($\rho = 0.45$), ankle plantar flexor moment ($\rho = 0.38$) and first peak of vertical ground reaction force ($\rho = 0.48$). **Conclusion.**

Better motor recovery at the paretic upper limb after stroke was associated with faster walking velocity, more hip flexion in swing, symmetry in weight-bearing, better push-off and less necessity to compensatory pelvic movements. Gait pattern after stroke is associated with motor recovery stage of the paretic upper limb so that interventions and gait training should focus not only at the lower limb but upper limb as well.

Correlations between intelligence levels and event-related potentials in hyperactive and normal children

L. Foggia, M. Colucci, O. D'Addio, M.R. Bisogno, R. Gigante
Napoli, AORN Santobono, Pausilipon, S.C. Riabilitazione Multispecialistica

Introduction. Event-related potentials (ERP) waves have been used as markers of different cognitive processes. This study determines the correlations between intelligence levels and event-related potentials in hyperactive and normal children. **Materials and methods.** Performance and verbal scores of the Wechsler Intelligence Scale for Children-Revised (WISC-R) (1) and of the Cognitive Development Scale for Children (EDC) were obtained on 21 hyperactive subjects aged 6.3 years to 8.9 years; the control group consisted of 15 girls and 15 boys (mean age: 7.2 years). Amplitude and latencies of the fronto-central P250 and of the parieto-occipital N250, P350 and P500 were measured in four categorization tasks derived from tests of the WISC-R and EDC batteries. Correlations were computed between the intelligence and the ERP factor scores (2). **Results.** Age-related and age-corrected WISC-R's scores were correlated with similar ERP changes (decreased latency and reduced amplitude) (3). With regard to the amplitude changes each type of intelligence was associated with a specific ERP pattern; the verbal scores were correlated with the P350 and the P500 amplitudes and the performances scores with the frontal P250 and occipital N250 amplitudes. On the contrary development and intelligence scores yielded ERP correlates in the opposite direction: P500 amplitude was negatively correlated with raw EDC scores, but positively with scaled EDC scores. In addition the intelligence was not related to the general peak latency decrease with age. In hyperactive children additional negative correlations were found between P250 amplitude and the subjects' verbal test scores. Correlations with some performance tests were negative in normal controls and were positive in hyperactive children. In addition latency-based correlations found controls were lacking in hyperactive children. **Conclusion.** Our results show that ERPs provide appropriate tools to assess the components of intelligence. They also suggest that the development and intelligence do not always rely on the same changes and that intelligence forms may not be referred to the same use of the processes in hyperactive and normal children.

References

1. WISC-R: Echelle d'Intelligence de Wechsler pour Enfants – Forme Révisée; Editions du Centre de Psychologie Appliquée, Paris, 1981.
2. Klorman R. et al.: Brain event-related potential in evaluation of cognitive deficits in attention deficit disorder and outcome of stimulant therapy; in L.W. Bloomington (Ed), Attention Deficit Disorder, Vol. 3, Pergamon Press, Oxford, 1988: 49-80.
3. Robaey P. et al.: An event-related potential study of controlled and automatic processes in 6-8 years boys with attention deficit hyperactivity disorder; *Electroenceph. Clin. Neurophysiol.*, 1992, 82: 330-340.

Efficacy of cyclic stretching in the prevention of equinus in acute and sub-acute patients with upper motor neuron syndrome (UMNS). A randomized controlled trial

I. Campanini¹, A. Merlo¹, L. Cavazzuti¹, F. Lombardi², R. Brianti²

¹LAM, Laboratorio Analisi Movimento (SOC Neuroriabilitazione), AUSL di Reggio Emilia, Correggio (RE)

²Riabilitazione Neurologica Intensiva (SOC Neuroriabilitazione), AUSL di Reggio Emilia, Correggio (RE)

Introduction. Since the acute phase after UMN lesion, patients develop muscle shortening due to soft tissue rearrangements and enhanced by muscle overactivity [1]. At the ankle, this phenomenon may provoke the equinus deformity that compromises the recovery of gait. This work aimed at verifying the efficacy of a protocol of cyclic stretching in preventing muscle shortening at the calf in acute and sub-acute patients with UMNS. **Materials and methods.** All UMNS patients admitted to our acute care unit over a three-year period were screened by a neurologist and included in this study on the basis of a set of inclusion criteria. Patients were randomised into a control (C) or a treatment (T) group. C patients received all the usual cares and treatments provided by the ward; T patients received the same cares plus a treatment of cyclic stretching of the calf muscles. The manoeuvres consisted in 60 s of stretch followed by 30 s of rest with 5 consecutive repetitions. The treatment was delivered 5 days a week for four weeks. An assessor, blind with respect to the allocation, measured the maximum passive ankle dorsiflexion (pDF) at flexed and extended knee (pDF-FK, pDF-EK) in baseline and in

endpoint after four weeks. **Results.** Sixty patients were randomized in TR (N=28, 2 drop-out) and in C (N=27, 3 drop-out), without significant differences in age, sex, time from lesion (51±24, 49±20 days), pDF-EK (3±9, 4±10 degrees) and pDF-FK (5±11, 7±11 degrees). In endpoint, a reduction in pDF-EK (pDF-FK) occurred in 15/27 (18/27) controls and in 4/28 (9/28) treated patients, with an absolute risk reduction (ARR) of pDF reduction equal to 41% (35%). Amongst those patients with pDF>0 degrees in baseline, the equinus deformity was present in endpoint in 3/19 controls and in 0/16 T patients, with ARR=16%. **Conclusion.** The treatment with cyclic stretching was effective in the prevention of the muscle shortening that leads to equinus foot deformity in acute and sub-acute patients with UMNS.

References

- Gracies J.M. (2005), Pathophysiology of spastic paresis I: Paresis and soft tissue changes. *Muscle Nerve*, 31: 535-551.

Pain management in rehabilitation

P. Marchetti¹, L. Franchini², S. Mastrangelo², A. Briganti¹, D. Miletto¹, S. Abriani¹, A. Nadalini¹, F. Ferrari¹, L. Spagnolatti¹, P. Bonacini¹, M.B. Ligabue¹, N. Rossi¹, D. Zoboli³, R. Brianti¹

¹Dipartimento di Riabilitazione AUSL Reggio Emilia

²Direzione AUSL Reggio Emilia

³Servizio Farmaceutico ASL Reggio Emilia

Introduction. Common conditions treated in a rehabilitation setting include a wide range of motor, cognitive and sensory impairment, that influences pain assessment. When a patient is non-verbal and cannot self report pain, as in vegetative state, a specific pain assessment should be conducted with proper scales. Pain might influence the possibility of restoring function and therefore clinical outcome, including quality of life. Hence the need to develop an interdisciplinary, multiprofessional and EBM approach as protocol in the practical management of pain in a rehabilitation setting. **Materials and methods.** A working group was initially convened and included various experts of rehabilitation (physical therapists, physicians, a psychologist, nurses) along with other specialists as technical advisor in pain management. A questionnaire has been designed to collect information about attitudes, beliefs, and behaviours in pain management from all health professionals of our Rehabilitation Department. The literature review (EBM) has been focused on scales and instrument for pain assessment in conscious and unconscious patients, the impact of pain on function recovery, drug therapy, physiotherapy, psychological, nursing care and non-conventional medicine. **Results.** Pain resulted to be underestimated and undertreated, also because of lack of proper assessment instruments and protocols. A classification by aetiology of most frequent pain treated in a rehabilitation setting has been operated. Therapeutic intervention causing pain has been also described. A census of all pathological conditions treated in each structure of the our Physical Medicine and Rehabilitation Department has been carried out. Finally, we selected appropriate scales and tools for pain assessment and protocols for a multidisciplinary treatment of specific types of pain and designed a protocol for practical management of pain in our Department. **Conclusion.** It is mandatory the use of appropriate instruments for pain assessment, as well as an adequate clinical competence.

Muscle damage and subsequent histological changes after intensive rehabilitation approach: Case report

F. Maselli, A. Rahinò, M. Cannone, M. Megna

Department of Neurological and Psychiatric Sciences, University of Bari, Division of Physical Medicine and Rehabilitation

Introduction. There are several classifications of muscle damage and in particular muscle-skeletal one are associated with severe pain and disability both at employment and social participation level. Rehabilitative treatment usually includes, in the acute phase, rest, ice, compression, elevation and a recovery phase whose main objective is restoring full mobility and then muscle training exercises with progressively increasing load. The goal of this study is to approach in a very early and intensively way in order to limit the structural changes in muscle repairing process and to improve the motor performances of the patient. **Materials and methods.** Patient, male, aged 32, injured by a direct trauma to the third distal of the left quadriceps that caused extensive muscle lesion with blood extravasation and fat replacement. He has been treated without surgery for 6

weeks with sessions of joint mobilizations, electro-stimulation , increasing load exercises, recovery of proprioception, ecographic evaluation was performed at 1, 3, 6 months and after 3 years. **Results.** After intensive rehabilitation course, full restoring of knee range of motion, increasing muscle mass and reduction of replacement fat tissue of the quadriceps, increased motor performance, return to activities. **Conclusion.** Better recovery of motor performance seems to be the result of an intensive rehabilitation program, also useful to reduce an excessive replacement of scar tissue at the lesion level. Further studies on a larger sample of patients are needed to confirm this results.

References

Aronen JG, Garrick JG, Chronister RD, McDevitt ER. "Quadriceps Contusions: Clinical results of immediate immobilization in 120 degrees of knee flexion". *Clinical Journal of Sport Medicine* vol.16, n°5, Sep 2006.
 Clarkckson PM, Hubal MJ. "Exercise-induced Muscle Damage in Humans". *American Journal of Physical Medicine & Rehabilitation* 2002; 81 (suppl): S52-S69.
 DeBerardino TM, Milne L, DeMaio M. "Quadriceps Injury". *Clinical Journal of Sport Medicine* Jun 2006.

Mental Imagery (MI) and Mental Practice (MP) for the recovery of facial expression in peripheral paralysis of VII C.N.: case report

A. Rahinò, P. Putignano, F. Maselli, M. Cannone, E. Tripaldi, M. Megna, G. Megna

Department of Neurological and Psychiatric Sciences, Physical Medicine and Rehabilitation, University of Bari "Aldo Moro"

Introduction. Most of peripheral paralysis of VII cranial nerve, especially inflammatory ones, the 85% regress in a spontaneous way in 2-3 weeks especially if supported by drug therapy. The other 15% of cases usually presents an impaired facial symmetry with negative effects on vision and oro-buccal functions. Our case present idiopathic palsy of VII c.n. in post-acute phase. **Materials and methods.** After functional assessment of the deficit, rehabilitation treatment have been set up twice a week for 30 sessions of about 30 minutes. Conventional rehabilitation approach consists in a trial of exercises in which patient was invited first to observe photograph series containing most common facial expressions such as smile, surprise, disgust, anger, sadness, etc., then subsequently the patient was asked to repeat facial expression observed, first mentally with eyes closed and then in front of a mirror. **Result and conclusion.** As result we noticed: a clear dynamic symmetry of the face with a positive impact on facial features and a considerable improvement on the test score (May stage classification of severity of facial palsy, facial palsy index of Stennert at all.) with recovery of muscle trophism.

References

Frey M, Michaelidou M, Tzou CH, Hold A, Pona I, Placheta E. Proven and Innovative Operative Techniques for Reanimation of the Paralyzed Face. *Handchir Mikrochir Plast Chir.* 2010 Feb 22. [Epub ahead of print]
 Jeffrey D. Tiemstra, MD, and Nandini Khatkhate, MD. *Bell's Palsy: Diagnosis and Management.* University of Illinois at Chicago College of Medicine, Chicago, Illinois. *American Family Physician* , Volume 76, Number 7, October 1, 2007.
 Anwar MN, Tomi N, Ito K. Influence of motor imagery on learning under complex external dynamics. *Conf Proc IEEE Eng Med Biol Soc.* 2009;1:5926-9.
 Linda Warner and M. EVELYN McNeill. *Mental Imagery and Its Potential for Physical Therapy.* *Physical Therapy*, Volume 68 / Number 4, April 1988

Project SAM: Satisfaction, Awareness and Motivation among undergraduate students of rehabilitative class (SNT/2) at the University of Bari.

M. Cannone, V. Lavermicocca, F. Maselli, M.R. Scaramuzzi, A. Rahinò, M. Megna, A.R. Dellomonaco, G. Megna

Department of Neurological and Psychiatric Sciences, University of Bari, Division of Physical Medicine and Rehabilitation

Introduction. To ensure health care quality, studies to trace the profile of students close to become practitioners are needed. The goal of this work is to analyze students perception of three essential dimension: Satisfaction, Awareness and Motivation towards their studies. Project SAM is promoted by 3 physical therapists and 3 speech and language therapists and directed at third year students related to rehabilitation area. **Materials and methods.** The students were asked to indicate on a 10 notches VAS their perception of: *Motivation* to work as rehabilitation practitioner. *Awareness* about the role of

rehabilitation practitioner in Health System. *Satisfaction* obtained by the university curriculum. The questionnaire included a bunch of other questions, useful to track a complete profile of students. **Results.** Analysis of data shows that under-graduate students, close to finish their studies, are highly motivated and aware but not very satisfied. The variance analysis excluded significant differences among different degree course. However, analysis of the entire questionnaire offers interesting points for further reflections. **Conclusion.** The study suggests the need for further surveys by validated and standardized tools in order to find best strategies targeted to improve satisfaction in rehabilitation classes. The need of excellence in basic training is a necessity perceived by all degree courses analyzed.

References

Bos S. Perceived benefits of peer leadership as described by junior baccalaureate nursing students. *J Nurs Educ*, 1998;37(4), 189-191.
 Currens J, Bithell C. The 2: 1 Clinical Placement Model: Perceptions of clinical educators and students. *Physiotherapy*, 2003;89(4),204-218.
 Dennis CL. Peer support within a health care context: a concept analysis. *Int J Nurs Stud*, 2003;40(3), 321-332.
 Secomb, J. A systematic review of peer teaching and learning in clinical education. *J Clin Nurs*, 2008;17(6), 703-716.

Upper limb recovery in a patient with Unilateral Spatial Neglect treated with mirror therapy: case report

A. Rahinò, A.R. Dellomonaco, V. Lavermicocca, F. Maselli, M. Cannone, M. Scaramuzzi, P. Putignano, E. Tripaldi, M. Megna

Department of Neurological and Psychiatric Sciences, Physical Medicine and Rehabilitation, University of Bari "Aldo Moro"

Mirror therapy is a form of treatment based on the motor imagery that affects the motor mirror neuron system: mirror neuron system: it's still used for the treatment of many medical conditions, including the recovery of the upper limb after stroke. The A.A. have used this type of treatment in combination with conventional rehabilitation on a patient with left hemiparesis associated with USN for the re-embodied his left arm. **Materials and methods.** Mirror therapy, was added to the conventional treatment of motor and cognitive rehabilitation for a number of about 30 treatments, 2 a week with the use of "learning table." The patient was evaluated and supervision continues with follow-up at 12 and 24 months. **Results.** With this treatment was obtained, a resumption of motor activity of the upper left-hand movement with purpose and a reduction of spasticity. **Conclusion.** The results of subsequent follow-up show that there was a retention of motor activity gained the advantage also of the slight reduction the muscle hypertone.

References

Sciusco A, Ditreanta G, Rahinò A, Damiani S, Megna M, Ranieri M, Megna G. Mirror therapy in the motor recovery of upper extremities. *Eur Med Phys* 2008;44(Suppl. 1 to No. 3)
 Lindberg P. Brain plasticity and upper limb function after stroke: some implications for rehabilitation. *Acta universitatis upsaliensis. Digital comprehensive summaries of Uppsala dissertations from the faculty of medicine* 2007.251.ISBN 978-91-554-6863-7
 Nelles G, Spiekermann G, Jueptner M et al. Reorganization of sensory and motor systems in hemiplegic stroke patients. A positron emission tomography study. *Stroke* 1999;30:1510-6.

Cognitive rehabilitation in dementia: case report

A. Parente, A.R. Dellomonaco, V. Lavermicocca, P. Battista, S. Lamacchia, E. Tripaldi, M. Megna

Department of Neurological and Psychiatric Sciences, University of Bari, Division of Physical Medicine and Rehabilitation

Introduction. Dementia is a disease characterized by decay compared with a previously higher level of cognitive and social functioning¹. In speech therapy, in mild-moderate dementia, the methodology of cognitive stimulation see the person actively supported and stimulated in countering the cognitive and behavioral deterioration to reduce the impact of disease on the level of self-sufficiency² and for a functional and ecological rearrangement. **Materials and methods.** The patient B.T., age 58, comes with referred mnesic disorders, progressive attention and guidance disorders. The RM indicates diffuse cerebral atrophy and the SPECT shows temporo-parietal hypoperfusion subscripts for diagnosis of primary degenerative dementia Alzheimer's type. Identified and quantified cognitive deficits through standardized tests, it was deemed more appropriate rehabilitative individual intervention. The intensive training lasted 6

months has expected the implementation of specific methods of intervention for individual cognitive deficits. It was also proposed to use a videogame created for the stimulation of the brain skills³. The cognitive domains stimulated were: language, spatial-temporal orientation, memory, attention and logical reasoning. The pursued exercises by patient by using computer have been "calculating", "reading works" and "count-syllables". Creative and ecological activities proposals: paint, play cards, bingo and sing. **Results.** The re-test showed a clinical situation essentially unchanged; the caregiver found a performance improvement in responsiveness, attention and social interaction, greater initiative in the choice and implementation of household activities and daily living. The patient is, therefore, more integrated in family and social context. **Conclusion.** As demonstrated by studies in literature, the treatment is effective in delaying disease progression, even worsening, if applied in the early stages and as early as possible⁴. The neuro-rehabilitation accompanies the course of the disease to improve the functional adaptation of the patient in his totality.

References

1. Cappa, 2000.
2. Steni, 2008.
3. Brain Training, Kawashima, 2005.
4. Spector, 2001.

Stimulation of oral function in vegetative state: case report

A. Parente, C. Zanella, A.R. Dellomonaco, V. Lavermicocca, M. Scaramuzzi, S. Baldassarre, M. Megna, G. Megna
Department of Neurological and Psychiatric Sciences, University of Bari, Division of Physical Medicine and Rehabilitation

Introduction. Vegetative state is a disease of the CNS damage secondary that clinically determines a state of coma of at least 24 hours and outcomes of severe disability. In acute post-surgery speech therapy intervention realized through physical stimulation mainly through the treatment of oral function because it recognizes the oral cavity as a means of high-value cognitive and neurophysiological¹. **Materials and methods.** We recruit the patient AP, age 81, in coma for spontaneous subarachnoid hematoma surgery, bearer of tracheostomy tube and PEG. The take-over speech and language therapy, one month after the injury, provided for the assessment of swallowing function and the application of scales for assessing the state of consciousness which indicated the classification of "vegetative state - severe vegetative state" (DRS) and "moderate coma" (CNC). Daily treatment for two months exploited the afferent stimulation (auditory, tactile, olfactory and visual) and specific manipulation of the oral cavity. The contemporary management of swallowing, has led to an oral feeding with mixed diet; while on cognitive side, the patient included orders simple and sometimes has verbalized in more constant and conscious way. After four months, the re-test reports "extremely severe disabilities" (DRS) and "no coma" (CNC). **Results.** The training, aimed at restoring the food function, has stimulated a parallel increase of the responsiveness level of the patient and the ability to measure these changes. **Conclusion.** The evaluation and rehabilitation path for vegetative state requires effective tools to increase the level of interaction with the external environment. The speech and language therapist applies sensory stimulation according "environmental enrichment" programs. Privileging the oral cavity and its related functions such as feeding, we can monitor the responsiveness level of the patient to get answers before reflected, then automatically and as far as possible intenzional².

References

1. Schindler O., 2001.
2. Zamboni M., in Riverberi C., 2007.

Customer Satisfaction in the Health System: the case of a Polyvalent Rehabilitation Centre

P. Perrone, A.R. Dellomonaco, T. Cetani, E. De Francesco, V. Lavermicocca, M. Cannone, M. Scaramuzzi, F. Maselli, A. Rahinò, M. Megna
College "Università degli studi di Bari" - Faculty of Medicine and Surgery.

Introduction. Customer satisfaction, on rehabilitation services, should be acquired directly from patients and measured with analytical methods. The goal of this study is to carry out a critical analysis

over the design of a survey used to assess and measure the customer satisfaction directly from patients of a polyvalent rehabilitation center, detecting critical issues. The objective is increasing quality and reliability of the acquired information, to improve the services delivered. The study suggests to use a new kind of survey for the detection of the customer satisfaction, focused on gathering feedback from patients on different aspects of their experience of cure and care they have received. **Materials and methods.** Identification of the main relevant areas; Building up a set of questions based on those identified areas; Selection of measurement metrics; Data interpretation, correlating the satisfaction level detected in each area with the relevance of the area itself. **Results.** Customer satisfaction can be influenced from expectations. Therefore it's necessary to create tools that can define a Customer Satisfaction Index (CSI) based on brief indicators of satisfaction and relevance levels, which consider both the perceived and the expected quality. **Conclusion.** Following the modern idea of health care service organization, where the citizen's centrality is wished, customer satisfaction can't be analyzed with generic and shallow tools. It's appropriate, instead, to design tools which could be more efficient in detecting the perceived and the expected customer quality, in order to built a Health System that is always more citizen-centered.

References

1. A. Tanese, G.Negro, A.Gramigna: "La Customer Satisfaction nelle amministrazioni Pubbliche. Analisi e strumenti per l'innovazione", i Manuali Rubettino Editore, Roma, 2003.
2. Szymansky D.M. e Henard H.D.: "Customer Satisfaction: a MetaAnalysis of the Empirical Evidence", Journal of Academy of Marketing Science, n. 29, 2001.
3. Schiavi G.: " Misurare la Customer Satisfaction nelle aziende sanitarie". Franco Angeli, 2004.
4. Battisti F., Pitrone M.C., "La Customer Satisfaction nella PA. Problemi di fedeltà dei dati raccolti tramite questionario", Rivista Italiana di Comunicazione Pubblica, n° 25, Franco Angeli, 2005.

The respect of identity of the patient for an ethical approach in operative unit of Physical Medicine and Rehabilitation

A.R. Dellomonaco. E. De Francesco, P. Perrone, Y. Lavermicocca, A. Rahinò, F. Maselli, M. Cannone, M. Scaramuzzi, M. Megna, G. Megna
Department of Neurological and Psychiatric Sciences, University of Bari, Division of Physical Medicine and Rehabilitation

Introduction. Social and cultural changes show the need to redefine the relationship with the patient, in respect of his subjectivity. Not just reach patient's satisfaction, but this must happen in the respect of his identity. **Materials and methods.** By the use of questionnaires is verified the value relationship between the operating unit and the patient, both directly and indirectly. The method applied is the statistical inductive one, with a qualitative data treatment. **Results.** While the patient does not show explicitly the need to meet a partner (operating unit) ethically sensitive in satisfaction of his need, on the other hand he feels the pleasure of being a co-agent of the health team, in respect of his identity. **Conclusion.** The optimal patient's satisfaction is proportional to respect of integrity of the user, who offers, to the operating unit, logical reasons and elements of practice to improve the offer, in the modular dynamism of the service required.

References

- Rusconi IG, Etica e Impresa. Un'analisi economico-aziendale, Bologna, CLUEB, 1997.
- Hirschman A. L'economia politica come scienza morale e sociale, Liguori, Napoli, 1981, pp. 116-134.
- Hoeffner J., La Dottrina sociale cristiana, Ed. San Paolo, Cinisello Balsamo 1987.

Case report: pragmatic approach and social reintegration in a case of global aphasia

V. Lavermicocca, A.R. Dellomonaco, A. Parente, M. Scaramuzzi, D. Mascolo, E. Tripaldi, M. Megna
Department of Neurological and Psychiatric Sciences, University of Bari, Division of Physical Medicine and Rehabilitation

Introduction. Global aphasia results from a massive injury to the language areas that causes a severe deficit in verbal comprehension and production, associated with changes in work, social and family life. Objective of this study is to document rehabilitative process in a

case of global aphasia, in order to recover communicative function. **Materials and methods.** The most effective treatment in global aphasia is based on pragmatic approach and involves the free choice of communication channels. The study concerns GG, 79 years old, with severe right hemiparesis, global aphasia, ideomotor/ideational and speech apraxia, dysphagia, deflection of mood and anosognosia. A month from stroke, the patient shows total lack of verbal language, with inability to use alternative communication channels. For pragmatic assessment were used the following protocols: *Communicative Efficacy Inventory*, *Assessment of Pragmatic Language and Functional Assessment of Communication Skills in Adults*. The patient was brought to an intensive rehabilitation path for one year. **Results.** After the first 6 months, there was reevaluation of communication skills, with significantly better performance. Within controlled environment, flow verbal expressions, dictated by contexts, which cannot be generalized to natural situations. The patient can communicate basic needs (FACS-CBE) through gestures. One year from acute event, and after further 6 months of training, communicative effectiveness is increased, both in conversation's participation and in variety of communicative products. The patient, currently, used verbal and nonverbal strategies in social contexts (FACS-CS). **Conclusion.** Through pragmatic approach, using essentially non-verbal channels, we obtained an active participation in natural contexts. Despite the severity of the neuro-cognitive state, the increase in participation has allowed the social reintegration with a significant impact on quality of life.

References

- Carlomagno Approcci Pragmatici alla Terapia dell' Afasia, 2002.
Frattali Functional Assessment of Communication Skills for adults, 1995.
Holland Communicative abilities in daily living, 1980.
Penn Pragmatic correlates of neurogenic language disorders, 1983.
Pruiting A clinical appraisal of the pragmatic aspects of language, 1987.
Wilcox PACE, 1985.

Role of manual therapy for the mobility recovering of ankle and foot joints after fracture of calcaneus: case report

F. Maselli, M. Cannone, A. Rahinò, M. Megna

Department of Neurological and Psychiatric Sciences, University of Bari, Division of Physical Medicine and Rehabilitation

Introduction. Calcaneus fractures represent 2-3% of all body's fractures. Intra-articular fractures have a worse prognosis than extra-articular. Considerable progresses have been made in the management of calcaneus fractures, both in surgical and rehabilitation directions, with positive impact on reduction of related complications. Rehabilitative approach includes: control of edema, ice, muscle strengthening, training, use of assistive devices, training exercises, recovery of proprioception. In addition we included joint mobilization treatments based on principles of manual therapy excluding use of any instrumental therapy techniques; the approach has been performed by physiotherapists. **Materials and methods.** A 36 years old male patient with severe obesity, left heel intra-articular fracture with multiple fragments, surgery for stabilization with Kirschner wires and plaster cast immobilization for 30 days. After removal of fixation rehabilitation sessions and joint mobilizations for 16 weeks, additional sessions after 3 and 6 months and controls after 3, 6, 12, 24 and 36 months. **Results.** Results concerning joints mobility, time management, pain, ambulation and return to daily activities and work have been measured with rating scales before and after treatment producing extremely good results. **Conclusion.** If compared to traditional treatments, manual therapy approach can improve joint mobility, reduce pain and help to a quick return to daily activities. Further studies with the use of good methodological quality and larger patient samples are necessary to confirm our case report.

References

- Barnard L, Odegard J. Conservative approach in the treatment of fractures of the calcaneus. *J Bone Joint Surg.* 1955;37A:1231-1236.
Palmer I. The mechanism and treatment of fractures of the calcaneus., *J Bone Joint Surg.* 1948;30A:2-8.
Robertson VJ, Baker KG. A Review of Therapeutic Ultrasound: Effectiveness Studies. *Physical Therapy* 2001;81:1339-1350.
Threlkeld A.J. The effects of manual therapy on connective tissue. *Phys Ther.* 1992; 72(12) 893-902.

Case report: Rehabilitative multidimensional-individualized approach to the person with Huntington's disease and caregivers

E. Tripaldi, A.R. Dellomonaco, M.R. Scaramuzzi, F. Maselli, V. Lavermicocca, A. Rahinò, A. Parente, M. Cannone, C. Cataldi, M. De Tommaso, M. Megna

Department of Neurological and Psychiatric Sciences, University of Bari, Division of Physical Medicine and Rehabilitation

Introduction. The analysis of the multiple symptoms in patients suffering with Huntington Disease (HD) has shown, in recent times, the need to design a multidimensional rehabilitative approach. Rehabilitation in HD is not a consolidated practice; this arises the need to describe a program of rehabilitation and education, addressed simultaneously to patient and caregivers. **Materials and methods.** The study is addressed to AN, 69 years old, with diagnosis of HD. Physiotherapeutic evaluation: Barthel Index, Berg Scales Scale and TUG test. Logopedic evaluation for dysphagia: Bedside Swallowing Assessment Scale (BSAS), sensitized by pulse oximetry and cervical auscultation. A 15-item questionnaire was used to assess caregivers. **Results.** Physiotherapeutic assessment retrieve significant balance deficits in standing position (static and dynamic) and alterations of the walking pattern. Logopedic assessment reported a BSAS score within normal limits. However, acoustic analysis of swallowing sounds showed an irregular track. **Conclusion.** The study concerning rehabilitation stressed up a discrepancy between the regular BSAS and the abnormal pattern of the spectrographic track, compatible with swallowing risk, perceived by caregivers but not by the patient. The survey on balance and walking ability related to falls shows the caregivers' need of specific education, in order to learn to manage falls risk in HD patients. This necessarily refers to a multi-dimensional approach both for physiotherapeutic and logopedic programs, aiming to the patient and his environment. The goal is to limit the fatal consequences of both swallowing risks and falls affecting expectancy and quality of life of the person.

References

- ASHA, 2004.
BSAS, Masotti et al. 2000 .
Russo A, Dellomonaco AR et al., "Analisi acustica dei suoni della deglutizione per un approccio alle turbe disfagiche di natura neurologica", 2007.
Santamato A et al, "Acoustic analysis of swallowing sounds: a new technique for assessing dysphagia", 2009.
Zinzi et al. "Effects of an intensive rehabilitation programme on patients with Huntington's disease: a pilot study.", 2007.
Busse ME et al. Physical therapy intervention for people with Huntington disease. 2008.
Peacock IW A physical therapy program for Huntington's disease patients. 1987.

Cancer-Related Fatigue in children. Preliminary data

A Morales Mateu, N. Rodríguez Nieva, V. Calderon Padilla, J. Medina Cantillo, A. Nuñez Farias, A. Febrer Rotger.

Physical Medicine and Rehabilitation Dept. Hospital de Sant Joan de Deu de Barcelona, Esplugues de Llobregat (Barcelona). Spain.

Introduction. Cancer-Related Fatigue (CRF) consists on debility, tiredness and lack of energy and modifies quality of life. It affects more than 70% adult with cancer. Its treatment is based on the identification and treatment of related factors and physical exercise. This pathology has been infra-diagnosed in the paediatric population. The aim of this study is to assess the CRF prevalence and its related factors as well as the quality of life, in a sample of children from 8 to 18 years old with several types of cancer, hospitalized in the Oncology Department of Sant Joan de Déu Hospital (Barcelona), from November 2009 to February 2010. **Materials and methods.** A descriptive transversal study. Demographic data, type of cancer, disease phase, CRF risk-related factors (anaemia, malnutrition, sleep, emotional disorders, pain), if they are receiving active chemotherapy, quality of life (Kidscreen-52 scale) and fatigue perception (Facit-F scale) were collected. **Results.** We have a sample of 18 patients in different moments of the cancer: 8 boys and 8 girls (mean age: 13.1 years). Types of cancer were leukaemia and solid tumours. 4 kids (22%) presented fatigue (score < 34 in Facit-F, average score = 40.13, range = 0-52). No statistically significant differences between fatigue and anaemia, pain, nutrition, sleep or emotional disorders were found. We didn't find differences with active chemotherapy at the moment of the study. Regarding to quality of life of the group, comparing with Spanish healthy population of the same age, worse punctuation on the physical well-being, autonomy

and psychological well-being were observed. In contrast, a better perception of relationship with parents, familiar life and scholar environment were appreciated. **Conclusion.** Cancer-Related Fatigue is an important entity to take into consideration in oncology paediatric patients, not only for clinical problems, but also because it's treatable according to the international recommendations. More studies are necessary to establish clear aetiological relations in children.

Functional outcome after hemiarthroplasty in elderly patients

M. Kocic, M. Lazovic, L. Dimitrijević, T. Ćiric, A. Stankovic, M. Spalevic
Clinical center, Clinic of Physical Medicine and Rehabilitation, Nis, Serbia

Introduction. Displaced femoral neck fractures (DFNF) (Garden III/IV) in elderly patients are most often managed by hemiarthroplasty (HA) or total hip arthroplasty. The aim of this study was to compare the functional outcome on discharge from inpatient rehabilitation after HA done in patients whose age is 80 and over between those under the age of 80. **Materials and methods.** The study included 83 healthy patients (51 women and 32 men) with DFNF treated with primary HA (Austin Moore Prosthesis), who had inpatient rehabilitation at Clinic of physical medicine and rehabilitation. They were at the time of operation 80 years old and over (on average 81.2) (group A) and under the age of 80 (on average 73.6) (group B). The inclusion criteria: intact cognitive function according to Short form mental status questionnaire > 7, prefracture ability to walk outdoors independently (with or without cane). The functional outcome assessment was performed at discharge from inpatient rehabilitation (on average 40.6 days after surgery) for each patient using: 1) pain, 2) walking ability with support (crutches or walking frame) independently or with another person and 3) active and passive hip flexion. We also noted and compared complications. **Results.** There were no significant differences between the groups in relation to all researched parameters (p>0.05). **Conclusion.** HA in patients with DFNF who are 80 years old and over resulted in similar functional outcome like in patients under the age of 80.

References

1. Sipilä J, Hyvönen P, Partanen J, Ristiniemi J, Jalovaara P. Early revision after hemiarthroplasty and osteosynthesis of cervical hip fracture: short-term function mortality unchanged in 102 patients. *Acta Orthop Scand.* 2004; 75(4):402-7.

Respiratory physiotherapy for morbid obese patients. Effects on autonomic function

M. de Sant'Anna Junior¹, J. Regis Ivar Carneiro¹, F. Silva Guimarães¹, Denise R. Xerez¹, A. Mafra Moreno², D. de Faria Magalhães Torres¹, R. Carvalhal¹, J.E. Paulo de Oliveira¹

¹Hospital Universitário Clementino Fraga Filho, UFRJ, Rio de Janeiro, Brazil

²Universidade Federal Fluminense, UFF, Niteroi, Rio de Janeiro, Brazil.

Introduction. Morbidly obese patients may present some dysfunction on their autonomic system. Leptin might modulate activation and reduction of sympathetic and parasympathetic function, respectively. This study aims to evaluate the impact of an 8-week respiratory physiotherapy rehabilitation program (RPRP) developed for morbid obese patients on their autonomic function. **Materials and methods.** We analysed the Heart rate variability (HRV) as a measure of autonomic function in a group of 24 morbidly obese patients (6m and 18 f), BMI range from 41,7 to 76,2 kg/m² (58,8±16,6 kg/m²), before and after the RPRP; based on the realization of two weekly work sessions of 1 hour of duration. Those sessions consisted on BIPAP ventilatory assistance (EPAP 8 / IPAP 12 cmH₂O) and inspiratory muscle training. The patients had been guided to use Respirom® at home after instructions. **Results.** BMI of the patients didn't change after the program. We noticed an improvement on the values of heart period variability referred to parasympathetic activity - The square root of the mean of the sum of the squares of differences between adjacent NN intervals (rMSSD) and the high frequency variability (HF), respectively (11,0 ± 5,1 ms vs 15,4 ± 8,3 ms, p < 0,05 and 9,18±2,1 vs 13±2,9 Hz, p < 0,05). **Conclusion.** The RPRP improved parasympathetic function of the patients, thus lowering a risk factor for sudden death on this population.

References

1. Skrapar Ii, et al. Baroreflex Sensitivity in Obesity: Relationship With Cardiac Autonomic Nervous System Activity. *Obesity.* 2007;5: (7).
2. Davy KP, Orr JS. Sympathetic nervous system behavior in human obesity. *Neurosci Biobehav Rev.* 2009;33 116-124
3. Sztajzel J, et al. Impact of body fatmass extent on cardiac autonomic alterations in women. *Eur J Clin Invest* 2009; 39 (8): 649-656

Impact of a Respiratory Physiotherapy Rehabilitation Program on the respiratory system of morbidly obese patients

M. de Sant'Anna Junior¹, J. Regis Ivar Carneiro¹, F. Silva Guimarães¹, D. Rodrigues Xerez¹, A. Mafra Moreno², D. de Faria Magalhães Torres¹, R. Carvalhal¹, J.E. Paulo de Oliveira¹

¹Hospital Universitário Clementino Fraga Filho, UFRJ/Rio de Janeiro, Brazil

²Universidade Federal Fluminense, UFF, Niteroi, Brazil

Introduction. Morbidly obese patients may present some dysfunction on their respiratory system. This study aims to evaluate the impact of an 8-week respiratory physiotherapy rehabilitation program (RPRP), developed for morbid obese patients on their respiratory function. **Materials and methods.** We analysed spirometry, maximal inspiratory pressure (P_{Imax}), maximal expiratory pressure (PE_{max}) and maximal voluntary ventilation (MVV) in a group of 24 morbidly obese patients (6m and 18 f), BMI range from 41,7 to 76,2 kg/m² (58,8±16,6 kg/m²), age range from 26 to 72 years old (46,5±12.5 years old); before and after the end of the RPRP, based on the realization of two weekly work sessions of 1 hour of duration. Those sessions consisted on BIPAP ventilatory assistance (EPAP 8/IPAP 12 cmH₂O) and inspiratory muscle training. The patients had been guided to use Respirom® at home after instructions. **Results.** BMI of the patients didn't change after the program. PE_{max}, P_{Imax} and MVV had higher values at the end of the program, respectively (87.5±16.9 vs 105.0±20.0 cmH₂O, p < 0,01; 72.1 ± 25.0 vs 99.1±17.4 cm H₂O, p < 0,01 and 95.8±24.6 vs 105.3±25.6 L, p < 0,05). **Conclusion.** The RPRP improved the values of PE_{max}, P_{Imax} and MVV, thus causing an improvement of respiratory muscle system function in this population.

References

1. Dempsey JA, Romer L, Rodman J, Miller J, Smith C. Consequences of exercise-induced respiratory muscle work. *Resp. Phys. Neurob* 2006; 151 : 242 – 50 .
2. Lourenco RV. Diaphragm activity in obesity. *J Clin Invest.* 1969; 48(9): 1609-1614. 3 - Luce J M. Respiratory Complications of Obesity. *Chest.* 1980; 78: 628-31.

Is it possible to improve the quality of life using low level laser therapy (LLLT) in rheumatoid arthritis patients? A double-blind investigation

O. Ilic Stojanovic, M. Lazovic
Institute for Rehabilitation, Belgrade, Serbia

Introduction. Rheumatoid arthritis (RA) causes irreparable joint destruction leading to decreased functional status and quality of life. Whilst the ICF endorsed, new biopsychosocial model of health opens a new outlook, the outcome of research has not been fully elucidated. The effect of LLLT is not always high dose dependant. Power energy density and energy density are the main parameters directly influencing the photobiological process. The energy dose expressed in J/cm² instead of J adds confusion to results analysis. (1) **Materials and methods.** In a double-blind investigation of 166 (comparable groups of 136 elementary and 30 control-placebo) RA patients (ACR criteria), following unsuccessful DMD therapy, LLLT was used. Patients from the elementary group had 3 LLLT courses over 1year. For ethical reasons the placebo group received one course. In order to answer the question above, this study included a well-established functional activity score Health Assessment Questionnaire-(HAQ,) visual analogy scale (100 mm) of pain at rest (VAS-R), and movements (VAS-M), duration of morning stiffness (min) and grip strength (mmHg). Irradiation parameters chosen individually (I=0.89mm, max.pulsed power 7W, 80Hz and/or 1000-1500Hz, energy density 0,008-0,15J/cm², energy dose per point 0.004J-0.3J) by transcutaneous method, targeted application site, for 10 days. Statistics for Windows 8.0 was used. **Results.** Elementary group showed significant increased grip strength (GS), while morning stiffness (MS), VAS-R, VAS-M decreased. (p<0.01) HAQ –score

shows clear improvement ($p < 0.01$) after LLLT. Results between courses showed a progressive decrease in MS ($p < 0.01$), VAS-R ($p < 0.01$), VAS-M ($p < 0.05$), improved **GS** and functional activity ($p < 0.01$). Investigated parameters stayed unchanged in the placebo group. Individual duration of laser efficacy was stable for 1-3 months, confirming data of prolonged and cumulative LLLT effects. **Conclusion.** This investigation confirmed that LLLT improves a quality of life in RA patients.

References

1. Lopes-Martins R.I.B., Penna S., Joensen J., Iversen VV, Bjordal JM. Low Level Laser Therapy [LLLT] in Inflammatory and Rheumatic Diseases: A Review of Therapeutic Mechanisms, *Current Rheumatology Reviews*, 2007, 3, 147-154

Effect of Lidocaine Iontophoresis on Pain during Needle EMG

A. Morchower, T. Annaswamy

University of Texas, Southwestern Medical Center at Dallas (sponsor), Veterans Affairs (VA) Medical Center, Dallas (study site)

Introduction. Patients often report acute pain associated with the needle electromyography (EMG) exam. This research study was designed to test the hypothesis that lidocaine iontophoresis applied prior to the needle EMG exam will mitigate the pain experienced during the EMG exam. There have been multiple studies examining various techniques to reduce pain during needle EMG, but none of these studies have looked at lidocaine iontophoresis for this purpose. **Materials and methods.** There were a total of 14 subjects that participated in this randomized double-blinded, placebo-controlled study. All subjects were referred to the VA Hospital EMG clinic for evaluation of bilateral upper extremity symptoms. A total of 40 mA-min of transdermal lidocaine 4% was administered using iontophoresis over the left opponens muscle. Both left and right opponens muscles were then tested using a monopolar needle. After the EMG, subjects completed a questionnaire asking them to rate the pain they experienced at the two tested sites and choose a preference for iontophoresis prior to the needle EMG exam. Normal saline iontophoresis was used for placebo. No subjects withdrew from the study. **Results.** Seven participants received lidocaine 4% in the iontophoresis electrode. Five participants in this active group indicated a decreased Visual Analog Scale pain score on the treated side. Ten subjects reported a preference for iontophoresis prior to undergoing needle EMG. We calculated, with a 95% confidence interval, that there was a decrease in pain when iontophoresis was used prior to the needle EMG exam. However, there was no significant difference between the active and placebo groups. **Conclusion.** From the data, we concluded that there was an apparent placebo effect by the presence of iontophoresis on pain reduction in needle EMG. Further studies are needed to determine if lidocaine iontophoresis affects pain perception in needle EMG and if it would be beneficial to use in the clinical setting.

Electrodiagnosis of Nerve Injury from Chronic Swelling in the Forearm: A case report

A. Morchower, Tong Zhu, K. Scott

University of Texas, Southwestern Medical Center at Dallas

Introduction. 46 year-old male admitted to Parkland Hospital for sepsis and multiple organ failure. After a two month stay in the ICU, treated with steroids and antibiotic, the patient was transferred to the inpatient rehabilitation unit. The patient was noted to have a large necrotic wound on the proximal right volar forearm that originated from an infected IV needle stick. Since this wound developed, the patient had been complaining of constant numbness and pain as well as swelling in his right forearm and hand that was distal to the wound site. He was referred to Electromyography (EMG) clinic to diagnose for possible nerve damage in the right upper extremity. **Materials and methods.** Physical exam revealed decreased motor strength within the right finger flexors, finger abduction and abductor pollicis brevis. In addition to distal muscle weakness, there was decreased sensation to both light touch and pin prick within the right forearm and hand distal to the healed wound site. Tinel's sign at the wrist was positive. All upper extremity reflexes were symmetrical bilaterally. A nerve conduction study of the right median, radial and ulnar nerves were obtained; as well as an EMG of select right upper extremity muscles. **Results.** There was electrodiagnostic evidence of acute distal median, ulnar and radial mononeuropathies

with demyelinating and axonal features. The exact location of the nerve injuries could not be determined; however evidence of denervation potentials were present distal to the area of patient's infected IV site. **Conclusion.** This patient developed axonotmesis in all three nerves of the forearm after local swelling from an infected IV site. There has been a reported case of an upper extremity infection with swelling causing a compartment syndrome in the forearm¹; however, this case did not require surgical decompression.

References

1. Leechavengvongs, *Hand Surgery*, Vol. 11, Nos. 1 & 2 (2006), pp. 77-82.

Establishment of a Rehabilitation Center in a State Prison Hospital: The Santa Casa de São Paulo Experience

S. Máira

Coauthors: C. Gomes, H. Nunes, N. Carvalho, T. Bertolini, R. Bueno, L. Fernandes, R. Guedes, Á. Gusmão, L. Martins, N. Meinrath, P. Miguez, W. Pedersolli, F. Ramos, L. Silva, T. Silva, G. Souza, F. Tristão, V. Vale

Centro Hospitalar do Sistema Penitenciário da Irmandade da Santa Casa de Misericórdia de São Paulo

Introduction. On april 2009, philanthropic public hospital "Santa Casa", engaged in a initiative along with the government of São Paulo to run the State Prison Hospital (Centro Hospitalar do Sistema Penitenciário – CHSP). After screening the main needs of the confined population, it became clear that a large amount of the patients presented medical conditions that led to disabilities. The settlement of a rehabilitation facility and a specialized team was mandatory. The Brazilian Public Health Service (SUS) guarantees total access to rehabilitation during inpatient treatment¹. It is far understood for health services providers that Rehabilitation must be available in any kind of medical treatment facility². Our team collected clinical data, performed function evaluations and implemented both inpatient and outpatient treatment programs, such as physiatrist consultation, occupational therapy, physiotherapy and prescription of orthosis, prothesis and other equipments. This Pilot Project aims to describe the profile of the patients rehabilitation needs that directed the establishment of our Rehabilitation Center. **Materials and methods.** Observational transversal study of clinical and disability conditions presented by prisoners during inpatient treatment by the time the hospital settled the health care on september 2009. **Results.** 111 of 365 patients that needed rehabilitation interventions were identified, due to neurologic (32), orthopaedic (25) and respiratory (54) conditions. None of them have been treated regarding disabilities and there was total lack of adaptive equipment in use. **Conclusion.** Regarding the patients main needs and the mission embraced by our health care facility, we began the settlement of the CHSP Rehabilitation Center hoping this initiative can soon turn our hospital into a reference for a humanized care to confined patients.

References

Serviço Único de Saúde, Portaria n.º 818/GM Em 05 de junho de 2001.

Halstead LS. Team care in chronic illness: a critical review of literature of past 25 years. *Arch Phys Med Rehabil* 1976; 57:507-511.

Activity implications for boys with DMD based on a MDX exercise study

T. Duong, M. Iantorno, A. Sali, H. Gordish, D. Guerron, K. Grassmeyer, K. Janes, M. Lerma, K. Nagaraju

Introduction. Duchenne muscular dystrophy is characterized by progressive muscle wasting of skeletal muscles due to dystrophin absence. Membrane instability leads to degen/regen of muscle fibers and eventual fibrofatty connective tissue replacement.² The susceptibility to dystrophin-deficient muscle to damage has led to concerns regarding exercise. Eccentric or maximal effort exercise has not been recommended. 1,2 Assessments of submaximal exercise will determine effects of concentric and eccentric types of exercises. **Materials and methods.** Four week old mdx and control (BL10) mice were assigned to four groups (n=5/group): non-exercised control (No Treatment; NT), Voluntary Wheel (VW), Horizontal Treadmill (HT), and Downhill Treadmill (DT) for a period of 10 weeks. The efficacy of exercise regimes using grip strength, rotarod, muscle force, a echocardiography. **Results.** There was no statistical difference in mean strength between all 4 groups from baseline and end-point measures. All groups except VW had trended towards decreased strength. Systolic heart function significantly improved in VW

($p < .05$) and HT ($p < .01$). Mean weight in VW mice was significantly different from all other groups ($p = .04$). Weight was significant between all groups and adjusted for in data analysis. **Conclusion.** Previous studies have shown that eccentric exercise (downhill treadmill) causes functional deficits in mdx mice. Our study shows mild submaximal exercise does not result in functional deficits, but instead shows improvements of some endpoints. Specifically, concentric exercise (VW, HT) showed improvements in heart function. Submaximal exercise may have benefits to other organ systems besides muscle strength. Future study of larger sample size and longer duration is recommended.

References

- Lovering et al. Muscular Dystrophies: From Genes to Therapies. Physical Therapy, 2005. 85(12):1372-1388.
Grange et al. Recommendations to define exercise prescription for duchenne muscular dystrophy. American College of Sports Medicine, 2007. 35(1): 12-17.

Combined application of external counterpulsation and extracorporeal cardiac shockwave therapy for rehabilitation of heart failure patients

V. Petukhova, T. Shapovalenko, K. Lyadov
Medical and Rehabilitation Center, Moscow, Russia

Introduction. It is known that external counterpulsation (EECP) and extracorporeal cardiac shockwave therapy (CSWT) are used at treatment of HP patients. At the same time, possibility of combined application of these methods at HP patients remains unknown. The aim of our study was to examine the effects of combined application EECP and CSWT in rehabilitation of HP patients. **Materials and methods.** We studied 24 patients (17 male and 8 female, average age 61.8 ± 2.8). All patients had myocardial infarction anamnesis. The basic group consists of 8 patients, which were treated with EECP (35 hour sessions, 6 days a week) and CSWT (9 sessions, 3 times a week, every two week) during 7 weeks. Pulse wave was applied to myocardial segments near post-infarction focus. Patients (9 persons) of the first control group received treatment only by EECP, patients (7 persons) of the second control group – only CSWT. Examinations were made before the beginning of treatment and after its ending: echocardiography (EchoCG) and ergospirometry (ESM). **Results.** Ejection fraction (by EchoCG) increased by 9,9%, 8,8%, 7,4%, end-diastolic diameter decreased by 4,0%, 3,3%, 2,8%, maximal oxygen uptake (by ESM) increased by 23,2%, 11,8%, 18,4%, maximal oxygen pulse (oxygen uptake to heart rate ratio) increased 15.4%, 12,8%, 11,2% in the basic, the first and second control groups accordingly. **Conclusion.** Despites of both methods had common influence mechanism to HP (myocardial perfusion improvement due to neoangiogenesis), combined application is more effective then isolated EECP or CSWT treatment. So this combination it seems to be reasonable to use in HF treatment. We are going to continue make analysis of effect of combination treatment also for patients with coronary arteries disease.

Usage of biological feedback at neurostimulation among patients with neurogenic bladder dysfunction

B.E. Rudakov, E.P. Rozhnevskaya, T.V. Shapovalenko, K.V. Lyadov
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. The objective of our research is to estimate the effectiveness of electrostimulation and BF-therapy for patients with NDO. **Materials and methods.** We treated 64 patients with NDO due to spinal cord injury (ASIA:C). All patients had a standard urological study. The patients had treatment on system Urostym (Canada), combining electrostimulation and BF-therapy, with taking medication Vezikar (5 mg per day). Electrostimulation of bladder was held using a rectal or vaginal sensor with the current intensity to 15-25 mA. Recorded during the session electric activity of muscles of the pelvic floor was shown on the display as animation. At the same time, using skin electrodes we registered bioelectric activity of muscles of the abdominal wall. The procedures were performed daily, the duration was 30 minutes. The course consisted of 15 procedures. **Results.** Before the treatment, the number of voiding was 14, the number of urgency voiding was 5 per day, the volume voiding was 123 ml. Cystometric bladder capacity was 130,5 ml, unstable contraction was noticed at consuming of 85 ml of liquid. The average rate of amplitude of the maximum unstable contraction was 38.5 cm. After the course, the number of voiding decreased to 8.5

times per day, the number of urgency voiding decreased to 2, the voiding volume increased up to 170 ml. The cystometric bladder capacity was 223,8 ml, unstable contraction was noticed at introduction of 158ml of liquid; the average rate of amplitude of the maximum unstable contraction was 17.6 cm. **Conclusion.** The method of electrostimulation combined with BF is aimed at the normalization of the work of detrusor by restoration urethra-detrusor reflexes.

Application of biomolecular conductor in the complex treatment of benign prostatic hyperplasia in the combination of chronic prostatitis

B.E. Rudakov, E.P. Rozhnevskaya, T.V. Shapovalenko, K.V. Lyadov
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. BPH combines with chronic inflammation of prostate in 75-95% cases. The purpose of our study was to estimate the effectiveness of complex medical and physiotherapeutic treatment in these patients. **Materials and methods.** We observed 64 patients with BPH and chronic prostatitis, average age - 53 years old, average duration - 2.2 years. After a standard urological examination all patients were randomly divided into 2 comparable groups - the study group (35 patients) and the control group (29 patients). All patients got basic medical therapy along with physiotherapeutic treatment by transrectal ultraphonophoresis of pantovegin and pneumovibrassage of the prostate. Additionally, the study group was treated by hydroelectrophoresis procedures (HYDROFOR, Italy) with a mix of medications (α -blockers, homeopathic remedy, vasodilators, antibiotics, anti-inflammatory agents, improving microcirculation drugs) applied on the area of perineum. The course consisted of 10 daily sessions. **Results.** All patients were examined one month after the treatment. The level of pain in the study group was 1.5-2 times lower than in the control group. Number of leukocytes in secret was normal (3 leukocytes) in all patients in the study group while in the control group only in 13 patients (44.8%) got normal data, other 16 patients (55.2%) had up to 10 leukocytes in sight. The level of PSA among the patients of both groups considerably decreased. Q max (ml/s) has increased from Q max (ml/sec) 12.8 ± 2.2 to 16.2 ± 2.4 in study group, with 13.1 ± 2.6 to 15.7 ± 2.9 in the control. Volume of residual urine was normalized in 28 (79%) patients in study group, with 10 (35%) in the control. All patients endured treatment satisfactorily without any pathological reactions. **Conclusion.** Application of the method of hydroelectrophoresis increases general effectiveness of the course, faster stops inflammatory process, eliminate stagnation in prostate, having a positive effect on the level of severity of symptoms.

Complex application of shock-wave therapy, biomolecular conductor and vacuum decompression of penis in treatment of Peyronie's disease

B.E. Rudakov, E.P. Rozhnevskaya, T.V. Shapovalenko, K.V. Lyadov
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. The aim of research is to estimate the effectiveness of physiotherapeutic treatment of patients with Peyronie's disease. **Materials and methods.** We treated 30 patients with plaques in penis, erection problems, pain during coitus. Complex treatment included session of hydroelectrophoresis, shock-wave therapy (SWT), low-frequency electrostatic field and vacuum decompression of penis. We used HYDROFOR (Italy) for conducting hydroelectrophoresis. This method allows injection of substance transcutaneously as deep as 10 cm. For each patient onto the area of the plaque we applied gel consisted of the mixture of angioprotectors, homeopathic remedy, vasodilators, anti-inflammatory agents. The course consisted of 10 procedures. SWT was performed using Dornier device (France). The advantages of SWT are: a positive anesthetic effect, an intensification of the circulation, a decrease in size and density of fibrosis. Amplitude of pressure during a session increased from 5 to 9 MPa, number of impulses was not more than 2000. The course consisted of 8 sessions 3 times a week. Impulse low-frequency electrostatic field was applied using system HIVA-MAT-200 (Germany) with frequencies of 170 Hz, 70Hz and 30Hz, duration was 5-7 min. The course of treatment consisted of 20 procedures. The Vacuum decompression of penis is a combination of vacuum around and monochrome radiation in the red part of the spectrum. The duration of procedures was 30 minutes, The course consisted of 10 procedures. **Results.** After the course of treatment

the plaques became smaller by 50-80%; in 3 cases plaques disappeared completely. Restoration of erection was achieved among 26 patients, considerable lessening of pain was noticed among 23 patients. **Conclusion.** Our method of treatment is very effective.

The transcranial magnetic stimulation for the patients with spinal cord injury

T. Shapovalenko, K. Lyadov, T. Baydova, I. Sidyakina, V. Ivanov
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. Complicated spinal injury is a frequent cause of losing ability and invalidity of ability aged patients. Increasing quantity of these patients demands to define neurophysiologic predictors of restoration of motor functions and to monitor the efficiency of rehabilitation. **Materials and methods.** 42 patients from 19 to 57 years old with spinal cord injury participated in the research. Among the observed patients 8 patients were taken in acute period, 14 – in an early restorative period, 10 – in a late restorative period and 10 – in a residual period of disease. In neurological status the clinic of full cross spinal cord damage: low paraplegia, conductive disorder of apprehensibility and infringement of function of pelvic organs, was found. All the observed patients received diagnostic transcranial magnetic stimulation (TMS) to estimate the function of pyramidal tract. An amplitude index of motor response during the segmental stimulation was chosen as a criteria. All the patients were divided into 2 groups (19 and 23 patients respectively) after the neurophysiologic examination. The patients of both groups received the standard course of neurorehabilitation. During 15 days the patients of the first group got sessions of transcranial magnetic stimulation of cortical motor zone (frequency 2 hertz, duration 10 minutes) in addition. **Results.** In the 1st group the amplitude index increased to 7,7%, in the 2nd group it increased to 2,6%. It was marked that 8 patients of the 1st group had motor response when stimulating motor cortex. **Conclusion.** Using of transcranial magnetic stimulation for treatment improves the conductivity through the spinal cord and makes conditions to prevent secondary axon-degenerative changes of peripheral neuromotor apparatus. It is a physiological base of rehabilitative potential.

Using of transcranial magnetic stimulation during the treatment of patients in persistent vegetative state

K. Lyadov, T. Shapovalenko, T. Baydova, I. Sidyakina, T. Isaeva
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. Increase of quantity of patients in “vegetative state” stipulates the necessity of creating treatment’s algorithm and differentiation of methodical approaches according to the initial neurophysiologic parameters. An essential meaning has studying of intracortical processes and an ability to influence the restoration of psychical activity. **Materials and methods.** We observed 31 patients from 2 to 6 months after incident with level of consciousness 7-9 points GCS. The cause of persistent vegetative state was traumatic brain injury, stroke, hypoxia. The age was from 18 to 50. Besides basic check-up (CT, MRI, EEG, evoked potentials) the patients got diagnostic transcranial magnetic stimulation (TMS) using twin stimuli. 3 groups were formed: the 1st – patients with intracortical inhibition and no facilitation (17 people), the 2nd – patients with intracortical facilitation and no inhibition (14 people), the 3rd - control group (19 people not examined by the TMS). The average primary GCS point in the 1st group was 8,27; in the 2nd – 8,32; in the 3rd – 8,65. Patients of the 1st and the 2nd groups received a course of rhythmical TMS (10 procedures 3 times a week). **Results.** In the 1st group the tendency of consciousness increase to 0,83 points in average in comparison with the control group ($p < 0,1$). In the 2nd group there were no essential differences and dynamics according to Glasgow scale in comparison with the 3rd group (change of average GCS-point was 0,31 point); in the 3rd – 0,34 point. **Conclusion.** Presence of intracortical inhibition and loss of intracortical facilitation at the same time can be the evidence of prescription for rhythmical TMS during the persistent vegetative state. If there is no inhibition and there is intracortical facilitation the TMS for treatment doesn’t influence essentially dynamic psychical processes of patients in vegetative condition.

Complex treatment of lumbodinia using extracorporeal shock wave therapy

S.A. Khakimov, K.V. Lyadov, T.V. Shapovalenko
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. To evaluate effects of extracorporeal shock wave therapy (ESWT) in complex with cryotherapy on lumbodinia. **Materials and methods.** We observed 30 patients (12 men and 18 women), aged from 32 to 60 years old. All patients had protrusion of discs at L4-L5, L5-S1 levels. The patients estimated the pain according to VAS from 4 to 6 points. All patients received ESWT by “MASTERPULS MP 200” (pressure of 2-3 atm, frequency 8-15 Hz, 2000-2500 impulses), mobilizing-vacuum therapy (MVT) by LPG S6. The area of the impact was chosen by palpation and by the method of biological feedback. The patients were divided into 2 groups: 15 patients (control group) treated by MVT and ESWT. Other 15 patients (basic group) received MVT and cryotherapy by “CRIOJET 100” on an impacted zone before ESWT. The duration of treatment was 2 weeks and consisted of 6 sessions. The dynamics of clinical symptoms were measured after 1 and 6 session. **Results.** There was the decrease the of pain in patients of both groups, more considerable in the basic group. The level of pain in control group reduced in 69%, in basic group - in 83%. **Conclusion.** It was shown that the use of cryotherapy of an impacted zone before ESWT is more effective than only ESWT. We suppose that cryotherapy could increase analgetic ability of ESWT. The offered complex may be recommended for treatment of lumbodinia

Restoration of equilibrium function among patients with Ménière’s syndrome

I.Y. Ganichkina, I.V. Sidyakina, T.V. Shapovalenko, K.V. Lyadov
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. Disorders in the equilibrium function, such as unsteadiness and uncertainty of the gait, among patients with Ménière’s syndrome tend to progress with each new attack. Effectiveness of the treatment depends on the stage of the disease and selected medical therapy. Meanwhile aspects of functional training of vestibular equilibrium of these patients on stabiloplatforms are not completely solved. The objective of the research is to compare the efficiency of stabilotraining on stabiloplatform among patients with Ménière’s syndrome at different stages of the disease taking into consideration medical therapy. **Materials and methods.** We observed 54 patients (16 men) with Ménière’s syndrome, aged from 28 to 42 years old. The patients were divided into 4 groups. Depending on the stage of the disease, all patients had relevant medical treatment. There were 16 patients at the first stage of the disease in Group A, 23 patients at the second stage in Group B and 8 patients at the third stage in Group C. In the control Group D there were 7 patients in 1st-2nd stages who had only medical treatment without stabilotraining. The patients were estimated by videoculography, pure tone audiogram and electrocochleography before and after the course of training. The training took place on stabiloplatform “Equilibrium Master” during 30 min, vestibular load of II-III level of difficulty, the course included 10 (one per day) training session. **Results.** Positive dynamics of the Equilibrium Score in Group A was 17 points, in Group B – 14 points, in Group C – 11 points. In Group D the dynamics of the Equilibrium Score was 4 points. **Conclusion.** Medical therapy without stabilotraining does not allow to activate restoration mechanisms of equilibrium

Peculiarity of central and peripheral circulation in spinal cord injured patients during Lokomat-training

M. Makarova, V. Petukhova, E. Koneva, T.V. Shapovalenko, K.V. Lyadov
Treatment and Rehabilitation center

Introduction. Skeletal muscle atrophy with reduction of microcirculation occurs rapidly secondary to spinal cord injury (SC I) that makes difficulties to form individual walking rehabilitation. The purpose was to examine the influence of dynamic body weight supported robotic training (Lokomat) on central and peripheral circulation of SCI patients in post acute period. Insert the introduction. **Materials and methods.** The study included 41 patients with chronic ASIA A, ASIA B SCI patients (C- level - 9 patients, Th- level -15 patients, Th12-L2 - level - 17 patients) from 19 to 35 years old. All patients

had everyday 30 min Loko-training in a combination with the intensive rehabilitation. The walking protocol was: upload of body weight - 0-20%, speed varied from 1,2 to 1,8 km/h depended on level of spasticity and stretch reflex activity. We controlled reaction of central and peripheral circulation by the methods of volume compression oscillometry (APKO, RU) and laser analysis of capillary blood flow (LAKK, RU) before and after of 5th Loko-training. **Results.** It was determined that cardiac output increased in patients with C-level trauma (C) in 6,7%, "h-level (Th) in 9,7%, L-level (L) in 13,3%. Stroke volume increased at 10,5% in patients C, reduced at 10,9% in patients Th and soared up 25 % in patients L. Linear velocity of blood flow increased in 20 %, 6,2% and 20 % in patients C, Th and L respectively. Peripheral resistance index changed at 4,5%, 14,6% and 11,2% in patients —, "h and L respectively. **Conclusion.** The circulatory reactions by treadmill training in SCI patients differed from the normal physiological reactions. They depended on level of spinal cord injury and in the whole they reflected the adaptive mechanisms of physical training. The patients with lumbar level of trauma need in individual Loko-training protocol considering peculiarity of their circulation reactions.

Application of homotoxicological pharmacopuncture in the programs of treatment of patients with vertebro-genic pain syndromes

A.A. Chigarev, K.V. Lyadov, T.V. Shapovalenko

Treatment and Rehabilitation Center, Moscow, Russia

Introduction. The objective of this study is evaluate effectiveness of homotoxicological pharmacopuncture (HP) in the programs of treatment of patients with vertebro-genic pain syndromes. **Materials and methods.** We studied 428 patients, aged from 18 to 84 years old. All the patients had dorsopathy of different stage and levels. We used a set of 3-4 complex homeopathy medications produced by "Heel" (Germany). Each set consisted of basic medications with one of organic substances and one of catalysts. A set was injected into the area of the chosen points by the method of consecutive injection intradermally and subcutaneously. First two sessions were conducted into the points, remote from the pathological nidus, starting from the third procedure, local algic, trigger and segmental points were added to the remote ones. The course of HP consisted of 10 procedures with contractive frequency from 3 to 1 times a week. Along with HP, the patients from the basic group had sessions of manual therapy, mobilising-vacuum therapy by LPG, electrostimulation of the deep spinal muscles by Polarskin, shock-wave therapy, traction spine therapy. The control group had the procedures mentioned above without HP. **Results.** We discovered that in the basic group pain syndrome regressed by the 4th procedure and in the control group by the 7th. We didn't notice any side effects during HP, although most patients complained that intradermal injections were rather painful. The highest effectiveness of the treatment programs, which included HP, was noticed among patients with expressed vertebro-genic pain syndrome, and also among senior patients. Among those patients who had 2 and more courses of treatment, including HP, the duration of remission was from 6 to 18 months. **Conclusion.** Including procedures of HP into the treatment programs of patients with vertebro-genic pain syndromes is reasonable as it is effective and safe. Procedures of HP can be conducted prior for treating vertebro-genic pain syndromes of senior patients in case many other procedures are contra-indicated.

Some peculiarities of shock wave reflex-therapy of vertebro-genic-diskogenic diseases

V.V. Korotkiy, S.A. Khakimov, K.V. Lyadov, A.P. Manevskiy

Treatment and Rehabilitation Center, Moscow, Russia

Introduction. The aim of our work was to identify the peculiarities of reflex responses received during shock wave reflex-therapy (SWRT). **Materials and methods.** We studied the results of usage of SWRT during the treatment of 32 patients (14 men) (aged from 23 to 67 years old) with dorsopathy. All patients also had different concurrent somatic diseases which required reflex-therapeutic treatment. The points for reflex-therapeutic treatment were chosen according to the individual peculiarities of patients and according to the canons of traditional eastern therapy. We mostly chose the points used for topping up the organs in case of enegro-functional lack, lo-points for normalization of energy in paired meridians and in some cases seda-

tive points of canals of those organs which were in the condition of expressed enegro-functional excess. This choice of the main points was added by including the points of posterior-medium canals, situated on the level of the patient's pathologic changes in the spine. Each patient had from 1 to 6 sessions of SWRT using STORZ MEDICAL MASTERPULS MP 100. Altogether, 85 sessions were conducted. During the shock wave therapy, according to the pulse data, we selected the most acceptable levels of impact. **Results.** SWRT impacts on acupuncture points are more likely to have sedative effect. We didn't always manage to tope up canals even when we had an impact on tonic points. At the impact on stabilizing lo-points in most cases we manage to normalize energy in paired meridians. The most optimal types of impact on acupuncture points are shock waves of 1,2-1,4 Bar, with the frequency of 5Hz, and also usage of mono shocks for topping up (15 per one point), and for sedative effect - 50-70 shocks. **Conclusion.** Thus, SWRT can be used for correction of reflex status among patients with dorsopathy, as well as, among patients with a different therapeutic pathology, especially to achieve sedative effects.

The influence of complex programs of restoration treatment on the increase in life quality of trauma brain injured patients

E.S. Koneva, M.R. Makarova, S.E. Khatkova, T.V. Shapovalenko, K.V. Lyadov

Treatment and Rehabilitation Center, Moscow, Russia

Introduction. To evaluate a complex of treatment of upper limbs spasticity in trauma brain injured (TBI) patients, including botuline A therapy followed by intensive rehabilitation. **Materials and methods.** The study group consisted of 49 patients, (31 men) from 18 to 47 years old 6-24 months after TBI with upper limbs spasticity (3-4 points by Ashworth scale). All patients were randomly distributed into 2 comparable groups: basic - 29 patients, control - 20 patients. All patients got botuline A injections into the spastic muscles. The basic group, along with injections, received electrostimulation, acupuncture, massage, orthoses, cycling, passive motion, task-oriented exercises, ergotherapy and "Armeo" robot- training. This complex was performed daily 6 times a week for 8 months in continual physical training with courses of physiotherapy. **Results.** The decrease of spasticity by 1-2 points by Ashworth scale in basic group opposite to 1 point in the control. Range of motion in shoulder increased by 15-20° in basic group and 5-10° in control. Barthel ADL increased from 30-40 points to 60-70 points in basic group, to 45-55 points in control. FIM - from 70-78 points, to 100-108 points and to 80-88 points in basic and control group. Nottingham Ten-point ADL index - from 40 points, to 80 points and to 60 points in basic and control groups. Action research Arm Test- from 22-26 points, to 40-46 points and to 34-38 points in the study and control group. Frenchay Arm Test- from 1-2 points, to 3-4 points and 2-3 points in basic and control group. Nine-hole peg Test decreased from 8-10 sec, to 4-5 sec and 6-8 sec in basic and control group respectively. **Conclusion.** These data indicate that botuline therapy supplemented by intensive rehabilitation is effective approach for restoration of compensatory skills and associated social and living adaptation.

Gender and rehabilitation outcome in stroke patients

L. Iona, A. Varnier, E. Deotto, C. Dominutti, E. Bocin, S. Polentarutti, F. Lipanje, T. Giorgini, P. Di Benedetto.

Department of Physical Medicine and Rehabilitation, Institute of Physical Medicine and Rehabilitation, Udine, Italy.

Introduction. Stroke is one of the main causes of disability in Europe. Many variables have been stated to be related to functional outcome. Less is reported about gender influence. **Aim of the study.** The aim of the study was to assess if gender acts in predicting functional outcome. **Materials and methods.** We re-evaluated clinical findings in consecutive stroke inpatients who were admitted to our rehabilitation unit from January 2006 to December 2009. We studied 247 patients, 113 females and 134 males, mean age 68.0 (sd 12.9). In 169 patients an ischemic stroke was diagnosed, in 78 brain haemorrhage. Admission to our unit was usually performed 1-2 weeks after stroke onset, as soon as a clinical stability was achieved. When dealing with numerical variables t-test and/or Mann-Whitney test were performed. Qualitative variables were assessed for independence with Chi-square test. **Results.** females showed a worse BI and FIM scores both on admission and on discharge. These differen-

ce were statistically significant. Females were older (mean 69.4 vs 66.7, NS), were less affected with diabetes (22 out of 68 diabetics, $P < .01$), more affected with atrial fibrillation (113 out of 136, $P < .05$). **Conclusion.** Gender wasn't a factor in admission to our Unit. Nevertheless females showed a worse functional scoring both on admission and on discharge, while FIM improvement was slightly worse for males (mean 15.1 vs 16.7, not significant). We have no simple answer for the observed differences, as gender doesn't seem to relate to other well known prognostic factors.

References

Wyller TB, Sodrings KM, Sveen U, Ljunggren AE, Bautz-Holter E. re there gender differences in functional outcome after stroke? *Clin Rehabil.* 1997 May;11(2):171-9.
 Reeves MJ, Bushnell CD, Howard G, Gargano JW, Duncan PW, Lynch G, Khatiwoda A, Lisabeth L. Sex differences in stroke: epidemiology, clinical presentation, medical care, and outcomes. *Lancet neurol.* 2008 Oct;7(10):915-26.

Experience of the introduction of cardiac shockwave therapy (CSWT) in the treatment and rehabilitation of patients with coronary artery disease

V. Petukhova

Medical and Rehabilitation Center, Moscow, Russia

Introduction. The cardiac shockwave therapy (CSWT) method is the new technology that allows non-invasive impact on angiogenesis in the ischemic zone. The principle of CSWT is a focused action of a series of shock (acoustic) waves in the areas of hibernating myocardium (myocardium with reversible ischemia). Shock wave therapy is recommended in the presence of recurrent angina after myocardial revascularization, or in the presence of hibernating myocardium in patients with postinfarction cardiosclerosis **Materials and methods.** Rate shock-wave therapy has been fully performed in 26 patients (18 men, 8 women). Mean age was 58,8±7,3 years. In the history of all patients were transferred one or more myocardial infarctions, all patients remained angina phenomenon. The average functional class of angina 2,6±1,4. Before and after the treatment all patients passed out exercise testing in variant ergospirometry, stress echocardiography. The zones of hibernating myocardium were defined as a result of stress echocardiography and myocardial scintigraphy and then were exposed to shock waves. Therapy duration was 9 weeks with 9 sessions (3 sessions at 1, 5, 9 weeks). Each session consisted of 400 pulses at 4 zones of the myocardium. **Results.** Index of local contractility of the load was 1,62 ±0,42. Noted a significant decrease in the average FC angina to 1,6 ±0,8 ($p < 0.05$), increase exercise tolerance by 21,1%, a decrease of the local index of contractility with a load of up to 1,42 ±0,26, $p < 0,05$. **Conclusion.** Thus, our experience of application of CSWT allows to recommend this method as highly secure and effective method of treatment and rehabilitation of patients with coronary artery disease. The method allows improving the quality of life, increasing exercise tolerance, and reducing the frequency of angina attacks. Future research is needed to assess long-term results of shock-wave therapy.

Neck traction in the complex treatment of epicondylitis

I.I. Solonets, K.V. Lyadov, T.V. Shapovalenko

Medical and Rehabilitation Center, Moscow, Russia

Introduction. The majority of patients with epicondylitis have a clinical picture of cervicalgia or cervicobrachialgia, which led to application of neck traction (NT). **Materials and methods.** We observed 36 patients with external epicondylitis. The duration of the disease varied from a month to half a year. The first (basic) group (18 patients) was treated with a combination of neck traction (NT) and SWT. The second (control) group (other 18 patients) had SWT procedures only. NT was conducted on the 3D ActiveTrac table. The set of loads was chosen individually and according to the generally accepted standards. SWT was conducted on Masterpuls MP200 Storz Medical apparatus by an applicator with diameter of 15mm using the labile method in the area of external epicondyle of the elbow joint. SWT was focused on the points with maximum pain, the intensity of the impact increased. The procedure consisted of 2000 of pulses. The treatment took place twice a week; the course consisted of 6 procedures. The main dynamic criterion was the reduction of the pain syndrome. **Results.** In the basic group, 28% of patients had improvement after the first procedure, 44% – after the third one and 83% of patients – by the end of the course. In the control group the

first signs of improvement were noticed by 33% of patients only after the third procedure. By the end of the course, 67% of patients started to feel better. Only 22% of patients from the second group noticed that pain syndrome disappeared completely. In the first one, the number of such patients was 39%. **Conclusion.** Positive results were noticed in both groups, but the combination of NT with SWT proved to be more effective. It allows us to recommend it in the complex treatment of epicondylitis with accompanying dorsopathy

The influence of interval hypoxemic trainings on the efficiency of rehab of athletes after injuries.

K. Liadov, V. Preobrazhenskiy, O. Zinoviev, E. Sidorenko, T. Shapovalenko

Treatment and Rehabilitation Center, Moscow, Russia

Introduction. The purpose is to estimate the influence of interval hypoxic trainings on the efficiency of rehab of athletes after injuries **Materials and methods.** Design: randomized controlled trial. participants: 28 athletes (16 men and 12 women) after any injuries aged from 18 to 32 were randomized to two groups. The athletes did physical trainings (physiotherapy) daily for two hours 30 minutes during four weeks. Among the athletes of the main group 24 sessions during 35 minutes of IHT right before the standard physical training were leaded. The estimate of physical and functional conditions of athletes by means of CPET, test on the Biodex system (pick effort, N/m), hematological indexes (Hb, red cells) was leaded. The examination was leaded before the beginning of trainings, and after 4 weeks iteratively. The indexes of increase were compared in both groups. **Results.** The advantage of indexes of functional conditions in IHT group was not so large and statistically unessential, accordingly, in the controlled main group ($\pm 95\%CI$): VO_{2max} (ml/kg*m) 1,2±0,6 & 2,1±0,9; AT (ml/kg*m) 1,7±0,4 & 2,1±0,5; load power (W) 8,0±2,6 & 10,3±4,3; pick effort (95%CI) by the left: 2,9±0,7 & 3,7±1,5; 3,0±0,6 & 3,4±1,3; & by the right leg 2,9±0,7 & 3,4±1,5; 2,6±0,5 & 3,9±1,2. The distinctions of hematological indexes between the groups weren't revealed. **Conclusion.** IHT influences positively on some indexes of physical conditions of athletes during the rehab after injuries, but this effect wasn't expressed enough, so it needs additional research about the combined use of IHT and other physical factors of impact among the athletes during the rehab.

The influence of enhanced external counterpulsation in combination with physical therapy on the efficiency of rehab of athletes after injuries

K. Liadov, V. Preobrazhenskiy, O. Zinoviev, E. Sidorenko, T. Shapovalenko

Treatment and Rehabilitation Center, Moscow, Russia

Introduction. The purpose is to check the hypothesis of the positive influence of combined enhanced external counterpulsation (EECP) and physiotherapy on the period and efficiency of rehab after injuries **Materials and methods.** Design: randomized controlled trial. participants: 28 elite athletes (16 men and 12 women) after the surgical operations and conservative treatment aged from 17 to 35 were randomized to two groups. The athletes did physical trainings (physiotherapy) daily for two hours 30 minutes during four weeks. Among the athletes of the main group 24 sessions during 60 minutes of EECP by the pressure of 200-260 mm mercury column right after the standard physical training were leaded. The estimate of physical and functional conditions of athletes was leaded by means of CPET, tests on Biodex system (pick effort, N/m). The examination was leaded before the beginning of trainings, and after 4 weeks iteratively. The indexes of increase were compared in both groups. **Results.** The advantage of indexes of functional conditions in EECP group was statistically essential, accordingly, in the controlled main group ($\pm 95\%CI$): VO_{2max} (ml/kg*m) 1,2±0,6 & 2,8±0,6 ($p=0,003$), AT (ml/kg*m) 1,7±0,4 & 2,1±0,6, load power (W) 8,0±2,6 & 21,2±3,6 ($p^{\wedge}0,001$), pick effort (95%CI) by the left: 2,9±0,7 & 26,7±3,5; 3,0±0,6 & 14,4±2,3; & by the right leg 2,9±0,7 & 29,4±3,7; 2,6±0,5 & 14,9±1,6 ($p^{\wedge}0,001$). **Conclusion.** EECP increases the efficiency of rehab of athletes after injuries and, possibly, is able to reduce the rehab period.

Enhanced external counterpulsation in heart failure decompensation

S. Tripkosh, K. Lyadov, T. Shapovalenko, S. Malanichev, A. Lutsenko
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. Enhanced external counterpulsation (EECP) is a method for non-invasive treatment of patient with heart failure (HF) and coronary arteries disease. Originally severe HF assumed as contraindication for EECP. The aim of study was to evaluate efficiency for severe HF patients. **Materials and methods.** Ten patients with heart failure decompensation were treated with enhanced external counterpulsation (EECP). Eight had HF NYHA class III, 2 had NYHA class IV. Control group was of 10 patients of approximately same age and severity, who had not received EECP. Treatment course included 30 EECP sessions. The treatment performed with one-hour sessions twice a day. Before the initial session and after last session patients were examined with echocardiography and ergospirometry **Results.** Echocardiography. Two patients had no improvement after the treatment, one has moderate ejection fraction (EF) decrease without left ventricle size change, seven had EF increase and little left ventricle end-diastolic size (LVD). Average EF was $31.8 \pm 4.63\%$ and $34.7 \pm 4.67\%$ before and after treatment ($p < 0.01$). Average LVD was $5.74 \pm 0.32\%$ and $5.61 \pm 0.38\%$ before and after treatment ($p > 0.01$). Ergospirometry. Every patient has positive change. Average peak oxygen consumption was 12.0 ± 1.81 and 13.97 ± 1.93 before and after treatment ($p < 0.01$) In control group. Average EF was $31.2 \pm 4.22\%$ and $32.4 \pm 4.34\%$ before and after treatment ($p > 0.01$). Average LVD was $5.68 \pm 0.33\%$ and $5.60 \pm 0.36\%$ before and after treatment ($p < 0.01$). Average peak oxygen consumption was 11.9 ± 1.83 and 12.3 ± 1.99 before and after treatment ($p < 0.01$). **Conclusion.** EECP is effective and safe for patients with severe heart failure and can be recommended in complex therapy of decompensate heart failure patients.

Combined application of enhanced external counterpulsation and cardiac shock wave therapy in coronary arteries disease

S. Tripkosh, K. Lyadov, T. Shapovalenko, S. Malanichev, A. Lutsenko
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. Enhanced external counterpulsation (EECP) and cardiac shock wave therapy (CSWT) are methods for non-invasive treatment of patient with heart failure (HF) and coronary arteries disease (CAD). The aim of study was to evaluate efficiency of combined application of these methods for patients with CAD. **Materials and methods.** Thirty patients were divided to 3 groups. Every group included 4 patient with class 1 CAD, 3 with class 2 CAD, 3 with class 3 CAD. Ten patients with CAD were treated with EECP only. Ten patients were treated with CSWT only. Ten patients were treated with EECP and CSWT simultaneously. EECP treatment course included 35 sessions. The treatment performed with one-hour sessions once a day 5 days a week. CSWT treatment included 10 sessions. The treatment performed with 300 impulses for a session three times a week. Before the initial session and after last session patients were examined with ergospirometry. **Results.** Average increase of peak oxygen consumption was 11.8, 18.4 and 23.2%. Average increase of peak oxygen pulse (oxygen consumption to HR ratio) 12.8, 11.2 and 15.4%. Average increase exercise time 38, 60 and 76%. **Conclusion.** Combined application of EECP and CSWT is more effective than EECP or CSWT only for patient with CAD.

Optimization of standard method of mobilising-vacuum therapy LPG considering the concept of eastern medicine

V.I. Tsoy, T.V. Shapovalenko
Treatment and Rehabilitation Center, Moscow, Russia

Introduction. Vacuum-mobilising therapy (LPG) is widely used in complex treatment of dorsopathies, but standard procedures have to be more flexible. The objective of our research was to optimize standard procedures for the LPG (unit S_0) in the treatment of dorsopathies. **Materials and methods.** We observed two groups of 30 patients, aged from 35 to 62 years old, 15 patients in each group. For the first group (control group), we used standard method of LPG of cervic-collar area and deltoid muscle. For the second group (basic group), we worked with muscle-tendon meridians (CJ, JG, TR, OJ, JG, TR) along with standard method. The duration of the procedures

was 10 minutes. The course consisted of 10 procedures, which were conducted daily. The course intensiveness – 2-3 with gradual increase as the patients started to get used to it up to 7, or in some cases to 9. We used specialized attachments according to the size of application areas. Verification of the results was made according to the visual-analogue scale (VAS) and F-metria of representative points CJ4, CJ11, CJ15. **Results.** In the first group after the course of treatment it was noticed that pain syndrome reduced in the interval 20-40% according to VAS, at F-metria of CJ4, 11, 15 – tolerance increased by 20-25%. The amplitude of movement increased by 10-30% in shoulder joint at anatomical axis. In the second group pain syndrome lessened by 40-80% according to VAS, at F-metria of CJ4, 11, 15 – tolerance increased by 40-80%. The amplitude of movement in shoulder joint at anatomical axis increased, and it is worth mentioning, that the increase mostly took place in sagittal (20-70%) and frontal (20-60%) planes. **Conclusion.** Use of standard methods of LPG based on concept of eastern medicine allows to individualize and improve the quality of treatment of dorsopathy.

Cardio-vascular functions and physical endurance

M. Lazovic
Institut of Rehabilitation, Belgrade, Sokobanjska 17, Serbia

Introduction. The cardiovascular system function is considered to be one of the most important functions of the human body. The primary function of the heart is to impart energy to blood in order to generate and sustain an arterial blood pressure necessary to provide adequate perfusion of organs. Physical endurance is the time span between the beginning of physical activity by an individual and the termination because of exhaustion. Cardiovascular endurance (CE) is the ability of the heart, lungs and blood vessels to deliver oxygen to working muscles and tissues, as well as the ability of those muscles and tissues to utilize that oxygen. CE is also frequently called cardio-respiratory endurance, cardiovascular fitness, aerobic capacity, aerobic fitness or is sometimes more broadly termed “endurance” - although endurance may also refer to the ability of the muscle to do repeated work without fatigue. It is also one of the five components of physical fitness. Cardiovascular endurance can be measured using a number of formal clinical methods including: VO_2 Max Test, Ventilatory Threshold or Lactate Threshold Test, Graded Exercise Tests, Exercise Electrocardiography. Non-clinical tests for cardiovascular endurance: Resting Heart Rate, Cooper Test, Estimated VO_2 Max. Borg test is also very usefull as practical test of perceived exertion by accocont a persons fatigue level. **Conclusion.** Like training your muscles, continuously challenging your cardiovascular system with increased levels of aerobic activity will generally result in gains in cardiovascular endurance and fitness. This can be duration running, biking, swimming, cardio at the gym, or even higher-intensity activities like sprinting or interval training, which have been shown to increase VO_2 Max.

References

1. Pollock ML, et al. Resistance exercise in Individuals with and without Cardiovascular disease: Benefits Rationale, Safety, and Prescription an Advisory from the Committee on Exercise, Rehabilitation, American Heart Association. *Circulation* 2000;101:828-33.
2. Meka N, et al. Endurance exercise and resistance training in cardiovascular disease. *Therapeutic Advances in Cardiovascular Disease*, 2008;2(2):115-21.

Use of Vibration Energy for Bone Regeneration: a case study

C. Trombetta, P. Abundo, A. Civitella, C. Panicia, N. Rosato, C. Foti
Medical Engineering Service, Fondazione Policlinico Tor Vergata, Rome, Tor Vergata University, Physical and Rehabilitation Medicine, Public Health Department, Rome

Introduction. The aim of the study was to assess the efficacy of local vibration treatments (LV) in delayed-union and non-union fractures, through therapeutic exercise vibration (TEV), analysing the radiological trend. This case report analyses the bone activity of a male patient presenting a right tibial fracture, treated with TEV. **Materials and methods.** In particular cases, where specific and local treatments are required, in order to focus the effects, the best solution is gained applying LV. To achieve this goal, the Medical Engineering Service of the Fondazione Policlinico Tor Vergata in collaboration with the Chair-Department of Rehabilitation Medicine of the Università di Roma Tor Vergata and the Boscosystem company, is developing a device dedicated to LV application, to favour bone regeneration and muscle

strengthening. In relation to our purposes, the developed device dedicated to LV application, was used during the vibration therapy exercise. This monthly program was scheduled in 5 weekly treatments consisting in 6 series of 5 repetitions each at 35Hz. **Results.** Since the early vibration applications, the patient expressed improvements in paresthetic symptomatology and a reduction of perilesion edema. At the end of the TEV program, clinical results confirmed independent ambulation with disappearance of perimalleolar edema and decrease of algic symptomatology, while radiographic images revealed the presence of bone repair activity around the fracture line. **Conclusion.** By analyzing the clinical results, Therapeutic exercise vibration (TEV) appears to have a determinant role regarding the activation of bone growth and its acceleration.

References

Foti C, Annino G, D'ottavio S, Sensi F, Tsarpela O, Masala S, Tranquilli C, Francavilla C, Bosco C. Preliminary study on the effects of high magnitude, low frequency of whole body vibration in physical activity of osteoporotic women. *Med Sport.* 2009, 62; 97-106. ISSN: 0025-7826
 Bosco C., Colli R., Intorini E, Cardinale M, Tsarpela O, Madella A, Tihanyi J, Viru A Adaptive responses of human skeletal muscle to vibration exposure. *Clinical Physiology*, 19(2): 183-187, 1999.

Any dose-response relationship in rehabilitative treatment of acute stroke? A study on 326 patients

E. Rizzi, G. Dora, C. Brun, D. Zanotti, G. Isabelli, M. Capovilla, C. Sottini

A.O. Spedali Civili di Brescia

Introduction. In 326 acute stroke patients evaluated via PMIC between 2007 and 2010 we investigated, mainly through CNS [1], if it is worth to administer rehabilitative treatment for 1 hour instead of just half an hour. **Materials and methods.** We divided the patients in 3 groups according to admission CNS (<4.5 [77 patients]; 5.0-6.5 [53p.]; >7.0 [196p.]) and in each subset about half, randomly, had 30 minutes treatment, the rest had 1 hour. **Results.** Recovery of all patients, evaluated at admission and dismissal with CNS, Rankin, TCT, Barthel Index, FAC, do not exhibit sensitivity to the amount of treatment (p>0.5). **Conclusion.** Our casuistic suggests that it is not worth to treat acute stroke patients longer than half an hour each day. These surprising evidences are proposed to colleagues to be discussed.

References

1. The ESO Committees : Guidelines for management of ischemic stroke and transient ischemic attack 2008. *Cerebrovasc. Dis.* 2008;25: 457-507
 2. SPREAD: linee guida 2007
 3. Franchignoni FP, Tesio L, Ricupero C, Martino MT : Trunk control test as an early predictor of stroke rehabilitation outcome. *Stroke.* 1997;28(7):1382-5.

Neurocognitive approach to severe brain injury: different point of views of intervention

G. Schierano, P. Valorio, M. Mantelli, S. Petrozzino

A.S.O.-Alessandria-Rehabilitation unit, Severe brain injuries unit

Introduction. The goals of cognitive functions rehabilitation in patients with severe acquired brain injury are a better life quality and social and family re-integration. The program we use has a comprehensive bio-psycho-social holistic approach. The goal of this work is to show the results obtained through this kind of program and a neurocognitive intervention with patients with severe acquired brain injuries. **Materials and methods.** We made a retrospective study on hospitalized patients in our severe acquired brain injuries unit from July 2008 till December 2009 with LCF 5 or more at the admittance and patient who joined LCF 5 or more during the hospitalization. Among the 92 hospitalized patients, only 55 had the right requirements for this study. Hospitalized patients during 2008 followed an individual neurocognitive program (group A), hospitalized patients during 2009 followed a neurocognitive treatment in little homogenous groups for 2 hours a day during all the hospitalized period inside the neurocognitive workshop (group B). The rehabilitation program was based on a comprehensive bio-psycho-social holistic model with a multidisciplinary approach involving a doctor, a psychologist, a speech therapist, a physical therapist and a nurse. Patients were involved in cognitive exercises, reading exercises, technical/informatics workshops, socialization through role playing exercises, spatio-temporal re-orientation, performance of ADL, problem solving exercises, planning exercises. The report of the reached functional outcomes was made with FIM, DRS and GOS scales. **Results.** The medium age of

patients into the two groups is similar. In A group medium LCF at the admittance was 5.1 and FIM 37.9, in B group LCF was 4.3 and FIM was 34.4. The decrease of DRS worth in A group is about 8.5 points (13.5 before treatment and 5.3 after treatment), in B group is about 10.4 points (16.8 before treatment and 6.4 after treatment). The increase of GOS worths in A group is about 0.4 points (3.0 before treatment and 3.4 after treatment), in B group is about 1.0 points (2.8 before treatment and 3.8 after treatment). **Conclusion.** This study doesn't have a statistical evidence but this kind of rehabilitation model had good results inside our rehabilitation program: it's an interactive holistic model which involved the patient, his family, the therapeutic team and the whole community. (4)

References

1. Sohlberg M, Mateer C. Introduction to cognitive rehabilitation theory and practice, Guilford Press, New (1989), Introduction to cognitive rehabilitation: theory and practice, Guilford Press, New York.
 2. Hashimoto et al. Effectiveness of a comprehensive day treatment program for rehabilitation of patients with acquired brain injury in Japan *J Rehabilatin Med* 2006;38:20-25.
 3. Ben Yshay YY, Diller L. Kurt Goldstein's holistic ideas: an alternative, or complementary approach to management of traumatically brain injured individuals. *US Neurology.* 2008;4(1).
 4. McLellan. Functional recovery and the Principles of Disability Medicine, in M.Swash, J.Oxbury (eds.), *Clinical Neurology*, Churchill, Livingstone, Edimburgh, 1991;768-90.

Tracheostomy decannulation in rehabilitation of ABI: l'essenziale

V. Cappuzzo, N. Giunta, G. Schierano, L. Perrero, M. Mantelli, M. Meloni, S. Petrozzino

Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy

Introduction. The 47% of patients with traumatic brain injury (TBI) needs a tracheostomy tube in the acute phase but only 9,4% has tracheostomy at the moment of discharge from rehabilitation. Considering both traumatic brain injury (TBI) and acquired brain injury (ABI) non traumatic the tracheostomy reach 50,4%. In these group we observe a strong reduction at the discharge too (19,6%). From these data is evident the importance of a correct weaning management of the tracheostomy tube in the rehabilitation of patient with TBI and ABI. **Materials and methods.** Revision of the literature. **Results.** In despite of mechanical ventilation weaning there are not standardized criterions for endotracheal tube decannulation. To perform a correct decannulation are important empirical considerations, clinical practice and some parameters listed below. Is mandatory to know the possible early (within the seventh day from the positioning) and late complications. Early complications (haemorrhages, removal or obstruction of the cannula, infection of the stoma, dysphasia and inhalation) are less relevant for a rehabilitation ward as the patients are usually recovered later on. More important are late complications (stenosis, tracheomalacia, granuloma, vocal chords paralysis, etc.) with an incidences of 65%. Even if there are not international criterions for tracheal tube decannulation, it is generically approved the necessity of effective reflexes of protection of the tracheobronchial airway: cough and swallowing reflexes. Usually patients are recovered in rehabilitation wards with tracheal tube equipped with inner tube (controcannula) but without a cuff. If a cuff is present, the first step for a correct process of tracheostomy cannula weaning, is to deflate the cuff. In some subjects can be useful the presence of a fenestrate cannula. The second step is to evaluate the swallowing reflex through the consultation of a speech therapist (logopedist). The third step is to evaluate the cough reflex considered the main respiratory criterion. The peak cough expiratory flow (PCEF) directly evaluated the cough effectiveness but is often not possible for the altered collaboration. If both of reflex are effective is possible to close the cannula. It should be done earlier than possible as it increase under glottis pressure regenerating the afference of the peripheral stimuli. It is also correct to effect a bronchoscopy before the decannulation to exclude complications. The enteral nutrition and the regain of consciousness don't represent a criterion of exclusion from the program of decannulation. **Conclusion.** Is evident an high incidence of endotracheal tube in TBI and ABI patients in rehabilitation ward at the moment of recovery. Comparing literature data and our experience we observe a difference in the percent of endotracheal tube at the discharge. Usually an ineffective cough reflex is unusual event, specially if there is not an associated high spinal cord lesion. An ineffective swallowing reflex is not frequent without associated cranial nerves (IX, X) or pons lesions too. Also considering tracheal condromalacia all complication

are esteemed in less than 5%. If data of literature report around 20% of patients in which is not possible decannulation, it is probable that are considered criterions of exclusion not really essential. Is desirable a future consensus agreement for the development of standardized criterions for a correct management and weaning of endotracheal tube.

References

- Whited RE. A prospective study of laryngotracheal sequelae in long-term intubation. *Laryngoscope* 1984; 94(3):367-77.
- Lewis RJ. Tracheostomies: indications, timing, and complications. *Clin Chest Med* 1992;13:137-49.
- Stauffer JL, Olson DL, Petty TL. Complications and consequences of endotracheal intubation and tracheotomy: a prospective study of 150 critically ill adult patients. *Am J Med* 1981;70:65-76.

Early risk factors of pressure sores in patient with brain injury

N. Giunta, V. Cappuzzo, G. Schierano, M. Mantelli, R. Baio, S. Petrozzino

Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy

Introduction. It's generally accepted that recovery from brain injury is not only due to the treatment of primary injury but also to the prevention and appropriate treatment of secondary complications¹⁻². One of the most frequent complications in patients with acute brain injury is pressure sores³⁻⁴. The aim of our study was to investigate the impact on our rehabilitation centre of pressure sores and evaluate the presence of any risk factors in the acute phase of brain injury. **Materials and methods.** Retrospective study was conducted on patients admitted to our Brain Injury Rehabilitation Unit from January 2009 to December 2009. **Results.** 43 patients were treated with brain injury, 25 male (58,1%) and 18 female. The mean age of the patients was 51,2 (17-83) years. The time that has elapsed between injury and rehabilitation admission was 35,8 days.. The etiology of brain injury was vascular in 62.8% of cases (27), traumatic in 25.6% (11), anoxia in 7% (3), from other causes in 4.6% (2). 14 patients were in LCF2(32,5%), 6 patients in LCF3(13,9%), 13 patients in LCF4(30,2%) and 10 in LCF≥5(23,2%). At the time of admission 12 patients (27,9%) had one or more pressure sores. The mean length of stay in the rehabilitation unit was 112,6 days (14-215). **Conclusion.** Results from the present study support the hypothesis that the time that has elapsed between injury and rehabilitation admission, the etiology of brain injury and the level of consciousness at the time of admission are considered as a prognostic factor for developing pressure sores. Furthermore, the level of consciousness influence the development of pressure sores more than degree of motor disability.

References

- Dénes Z. Consequence of secondary complications during there habilitation of patients with severe brain injury. *Orv Hetil.* 2009 Jan 25;150(4):165-9.
- Buchanan RJ, Wang S, Huang C. Profiles of nursing home residents with traumatic brain injury using the Minimum Data Set. *Brain Inj.* 2007 Jun;17(6):507-23.
- Zampolini M., a.n.d.g. gruppo GISCAR. I percorsi riabilitativi delle persone con grave cerebrolesione acquisita dalla presa in carico al followup. *Eur Med Pys* 2008;44(Suppl.1toNo.3).
- Safaz I, Alaca R, Yasar E, Tok F, Yilmaz B. Medical complications, physical function and communication skills in patients with traumatic brain injury a single centre 5-year experience. *Brain Inj.* 2008 Sep;22(10):733-9.

Continuing care for individuals with spinal cord injury and complex acquired brain injury

M. Lauro, R. Lorusso, M. Mantelli, L. Lebrino, S. Petrozzino

Introduction. Rehabilitation day hospital(RDH)improves the rehabilitation continuum for people with spinal cord injury(SCI)and with *complex acquired brain injury (CABI)* by reducing the time spent in hospital, increasing consumer control over the rehabilitation environment, identifying issues that required referral for additional specialist/services and enhancing community re-integration. **Materials and methods.** The functions of a comprehensive Spinal Cord Units and Traumatic Brain Units do not cease with the discharge of the patient from in-patient treatment after rehabilitation, they extend to aftercare with RDH both in medical follow-up and prevention and treatment of complications, and in ongoing support and educational of the patient and his family. **Results.** 165patients were admitted in RDH during 18months, 46%were affected by SCI and37% by CABI; 35 % came from home and 51%from acute rehabilitation unit.

Conclusion. Health care maintenance is very important in people with SCI and CABI to maintain an elevate level of independence in community, preventing unnecessary admissions in acute wards and minimizing the development of complications.Lifelong costs can be anticipated with the development of a comprehensive life care plan

References

- MB Kendall. Bridging the gap:transitional rehabilitation services for people with spinal cord injury" *Disability and Rehabilitation* 2003;25:1008-1015
- Brown DJ. Continuing care of the spinal cord injured. *Paraplegia* 1987;25(3):296-300
- Meyers SondikT. Continuity of care for brain injury patients:a model for neuropsychologists. *Archives of Clinical Neuropsychology* 15(2000)653-663
- L Turner. Stokes. Efficiency of specialist rehabilitation in reducing dependency and costs of continuing care for adults with complex acquired brain injuries. *J Neurol Neurosurg Psychiatry* 2006;77:634-639
- By Uomoto. Care continuum in traumatic brain injury rehabilitation. *Rehabilitation Psychology.*1989;34:71-79.
- Berwick DM, The triple aim:care, health, and cost. *Health Affairs* 2008;759-769.
- Chioldo AE. Spinal cord injury medicine.5. Long-term medical issues and health maintenance. *Arch Phys Med Rehabil.* 2007;88(3Suppl1):S76-83.
- Nelson AL. Patients' perspectives of a spinal cord injury unit. *SCI Nurs.* 1990;7(3):44-63.
- Williams S. Improving the continuing care for individuals with spinal cord injuries. *Br J Nurs.* 2005Feb10-23;14(3):161-5.
- Groah SL, Spinal cord injury medicine.5.Preserving wellness and independence of the aging patient with spinal cord injury: a primary care approach for the rehabilitation medicine specialist. *Arch Phys Med Rehabil.* 2002Mar;83(3Suppl1):S82-9,S90-8.

Computerized tomography (CT)-guided botulinum toxin injection (BTXA) of the iliopsoas muscle (IP) by posterior approach: a case report

M. Marchioni, L. Perrero, M. Lauro, V. Cappuzzo, S. Petrozzino

Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy

Introduction. In patients with iliopsoas spasticity, BTXA infiltration using surface landmarks is a challenge due to it deep anatomical position [1]. This report describes a technique for the localization of this muscle. **Materials and methods.** A 74-years-old man affected by post-ischaemic incomplete spinal cord injury (neurological level T12, ASIA C) presented with hip flexion deformity due to focal spasticity (Modified Ashworth scale 3 on the right side, 2 on the left), spasms of lower limbs (Penn scale 3), pain(VAS 8) and ischiatic pressure wound (Shea classification IV). A previous attempt of US-guided BTXA infiltration of the iliopsoas muscle by anterior approach was not beneficial. He was then injected by CT-guided posterior approach (Ward technique [2]) of both side[3,4]. **Results.** We observed an improvement in terms of hip ROM and relief of pain (VAS 5) at 30 and 90 days after the infiltration. **Conclusion.** Although the posterior approach to iliopsoas infiltration is less diffuse than the anterior one, it appears to be a superior procedure to the infiltration of the psoas muscle. However, in order to minimize the risk of injury of vital neighboring structures, precision guidance by CT is warranted.

References

Westhoff et al. Ultrasound-guided botulinum toxin injection technique for the iliopsoas muscle. *DevMedChildNeurol.* 2003;45(12):829-32.

Ward et al. Botulinum toxin type A treatment of hip and thigh spasticity: a technique for injection of psoas major muscle. *EurJNeurol.* 1999;6(Suppl4):91-93.

Porta et al. A comparative trial of botulinum toxin type A and methylprednisolone for the treatment of myofascial pain syndrome and pain from chronic muscle spasm. *Pain.* 2000;85:101-105.

Manzi et al. CT guided injection of the iliopsoas muscle: an alternative technique for the Intervention of spastic hypertonia. successful outcomes in a case series. *ArchPhysMedRehab.*200;89(11):79.

Complex acquired brain injury : infections at the early time of rehabilitation

R. Baio, N. Giunta, M. Lauro, M. Mantelli, S. Petrozzino

S.S. Antonio e Biagio Hospital, Alessandria, Italy Department of Rehabilitation,Borsalino Rehabilitation Centre

Introduction. The course of rehabilitation of patients with complex acquired brain injury (ABI) is prolonged, complex and often complicated by recurrent infections. The tracheostomy tube, the CVC, the catheter bladder and the PEG is a port of entry for pathogens, that can cause systemic infections often multi-resistant, espe-

cially in the first weeks of hospitalization, resulting in a slower path to rehabilitation. The rapid weaning from devices dramatically reduces the number of nosocomial infections. **Materials and methods.** Was conducted a retrospective study, in which they compared two groups of patients with ABI hospitalized in 2009 at our rehabilitation Unit. *Group A:* 40 patients from intensive care, carriers of tracheal devices, CVC and bladder. *Group B:* 18 patients with GCA from NCH, of which only 2 were tracheostomised. Were compared to the number and type of examinations culture, the bacteria found in the first 8 weeks of rehabilitation. **Results.** *Group A,* 32 (80%) reported at least once a positive sputum culture; 30 (75%) at least once a urine culture positive, 16 (40%) a positive blood cultures, of which 10 (25%) associated with positive cultural venous catheter tip. 36 tests were positive for *Staphylococcus* worship, 16 for *Pseudomonas A.*, 13 for *Klebsiella P.* *Group B,* 12 patients were performed from 1 to 5 cultural examinations (66.6%), 4 patients from 6 to 10 cultural examinations (22.3%) and only 2 patients who underwent more than 10 cultural examinations (11.1%). Cultivation tests positive: urine cultures (57), sputum culture (51), *Clostridium D.* (13), blood cultures (9), cerebrospinal fluid (5), vaginal swab (3). 45 cultures were positive for *Pseudomonas, A.*; 23 for *Serratia M.*; 20 for *Staphylococcus.* **Conclusion.** The results obtained in this study clearly indicate that infections are particularly a problem in patients with ABI. Reducing the time of weaning from the tracheal cannula and the early removal of CVC and urinary catheter is the best prophylaxis for infection.

References

- ENT clinical practice group and Outreach team. Guidelines for care of patients with a tracheostomy. Royal Free Hampstead NHS Trust, Nov 2002
 Gosbel I.B.: Central venous catheter-related sepsis: epidemiology, pathogenesis, diagnosis, treatment and prevention. *Int Care World* 11:54-58, 1994.
 Marshall J. Catheter-associated bloodstream infections: looking outside of the ICU. *Am J Infect Control.* 2008;36:S172-5-8.
 Zampolini M., a. n. d. g. gruppo GISCAR. I percorsi riabilitativi delle persone con grave cerebrolazione acquisita dalla presa in carico al follow up. *Eur Med Phys* 2008;44 (Suppl. 1 to No. 3).

Determination of quality of life in adolescents with idiopathic scoliosis subjected to conservative treatment

A. Specchia³, A.G. Aulisa¹, C. Perisano², G. Ronconi³, P.E. Ferrara³, A. Rabini³, C. Nigito³, L. Maggi³, D.B. Piazzini³, C. Bertolini³, L. Aulisa²
¹Dept. of Orthopaedics, Children's Hospital Bambino Gesù, Institute of Scientific Research, Rome, Italy
²Dept. of Orthopaedics, Catholic University of the Sacred Heart, University Hospital "Agostino Gemelli", Rome, Italy
³Dept. of Geriatrics, Gerontology and Physical Therapy, Catholic University of the Sacred Heart, University Hospital "Agostino Gemelli", Rome, Italy

Introduction. Physical deformities caused by adolescent idiopathic scoliosis (AIS) as well as conservative treatment with orthosis impact on patients' quality of life (QOL). This study aimed at evaluating the QOL in patients affected by AIS treated with brace and at determining the ability of different QOL questionnaires to monitor QOL during the treatment. **Materials and methods.** 108 patients (92 females, 16 males) affected by AIS admitted to the outpatient orthopaedic clinic of the Catholic University in Rome. Patients were subjected to full-time conservative treatment with the progressive action short brace (PASB), the Lyon brace or a combination of PASB + Lyon brace. 3 instruments were used for QOL determination: the Scoliosis Research Society 22 (SRS-22), Bad Sobernheim Stress Questionnaire (BSSQ) and the Brace Questionnaire (BrQ). **Results.** A significant correlation was detected among the 3 scores ($p < 0.001$). The BrQ possesses a higher capacity to detect changes in QOL in relation to the patient gender, type of brace, curve severity at baseline and at the end of treatment and type of curve. Boys displayed a higher QOL than girls. In all 3 questionnaires, higher QOL scores were determined in patients treated with the PASB compared with those with the Lyon brace. QOL scores were significantly correlated with the curve severity. Higher QOL scores were obtained by participants with thoraco-lumbar curves. **Conclusion.** The 3 questionnaires are equally effective in capturing changes in QOL in AIS patients subjected to conservative treatment. The BrQ possesses a higher discriminatory capacity compared with the other questionnaires tested. PASB-based treatment is associated with better QOL than the Lyon bracing.

References

- Negrini S, Grivas TB, Kotwicki T, Maruyama T, Rigo M, Weiss HR. Why do we treat adolescent idiopathic scoliosis? What we want to obtain and to avoid for our patients. SOSORT 2005 Consensus paper. *Scoliosis.* 2006;1:4. doi: 10.1186/1748.

Role of Spiritual Beliefs in inpatient rehabilitation unite: preliminary data

D.B. Piazzini, P.E. Ferrara, G.P. Ronconi, L. Maggi, A. Rabini, A. Specchia, C. Nigito, E. Amabile, C. Bertolini
 Department of Physical Medicine and Rehabilitation of Catholic University, Rome, Italy.

Introduction. Few studies investigated the impact of spiritual beliefs (Sb) on health-related quality of life and disability. The purpose of this study is to describe the characteristics and the relationship of Sb with disability and HRQOL gain in patients admitted in acute inpatient rehabilitation unite of Catholic University Rome. **Materials and methods.** 44 patients, mean age 67,4 years (SD 16,3), male/female ratio 12/32, took part in a physiotherapy programme for mean 40 days. They were evaluated with the Royal Free Interview for Spiritual and Religious Beliefs (RFI) (2) and Cumulative Illness Rating Scale (CIRS) at baseline, the 36-item Short Form Health Survey Questionnaire (SF36) and the Barthel index (BI) at admission and at discharge. We excluded patients with MMSE < 24. **Results.** 95,5% of participants were Catholic Christians and 2,3% belonged to other religions. All patients had a religious and Sb. The importance of practice faith was strong for 72% (>7/10), weak for 25,7 % (6-1/10), absent for 2,3% (0/10). The 88,6 % of patients practiced private prayer, 65,6 % worship attendance, 54,5% reading about their faith, 50% sharing with others. Frequency of religious practice was daily for 79,5 % of patients, monthly for 13,6%, annual or less for 6,8%. Mean BI at the admission was 41,2 (ds 10.5 range 25-75), and 87,2 (ds 10.3 range 58-100) at discharge, with a gain of 46 (ds 13.15). **Conclusion.** These preliminary data don't show significant difference between male and female in Sb, BI and SF-36 at baseline. We'll describe all results regarding relationship between Sb, BI and SF-36 gain at discharge during congress presentation

References

1. Pernice D, Alesii A, Spiridigliozzi C, Caracciolo B, Giaquinto S. The Italian validation of The Royal Free Interview for religious and spiritual beliefs. *Funct Neurol.* 2005;20:77-84.

JObA for chronic Low Back Pain

A. Sgadari, A. Rabini, M. Broccatelli, S. De Bellonia, L. Maggi, P. Ferrara, C. Nigito, C. Bertolini, D.B. Piazzini
 Catholic University of Sacred Heart, Rome, Italy

Introduction. Low Back Pain (LBP) is the most common musculo-skeletal disorder. Physical exercise is known to be effective in reducing pain and ameliorating functional level of patients with chronic LBP. Physical exercise, indeed, may improve vertebral stability through stretching and strengthening of "core" muscles (abdominals, trunk extensors, abductors, thigh flexors and extensors) and by enhancing neuro-muscular proprioceptive facilitation. Joba Core-Trainer (Joba-CT) is an ergometer which simulates the movements of horse-riding and efficiently engages the "core" muscles. We conducted a 12-week randomized trial to assess whether a training program based on Joba-CT is effective in reducing pain and improving physical function of subjects with chronic LBP. **Materials and methods.** Fifty-four patients (age 56.8±18.2 years, 72% women) with chronic LBP were randomly assigned to one of three groups: JOBA (3 training sessions/week with Joba-CT), Postural Exercise (PE; 2 training sessions/week), and a Control group (C) of sedentary people undergoing usual care. Pain intensity (Visual-Analogue Scale, McGill Pain Questionnaire), physical impairment (Roland-Morris Disability Questionnaire), and quality of life (Short-Form 36) were measured before and after the intervention. **Results.** Lumbar pain intensity significantly decreased after treatment both in the JOBA and in the PE group (from 58.1±14.9 to 32.1±11.3, $p = 0.001$, and from 54.1±18.7 to 34.8±15.5, $p < 0.008$, respectively), but did not change in the C group (from 55.3±21.3 to 53.4±19.8, n.s.). At the end of the study, the Roland-Morris Disability Score was significantly reduced only in the JOBA group (from 10.3±3.9 to 4.7±4.1, $p = 0.001$), not in the PE (from 10.2±5.5 to 8.2±4.5, n.s.) and in the C group (from 10.4±4.5 to 9.9±4.3, n.s.). **Conclusion.** A 12-week intervention program using Joba-CT 3 times/week is as effective as a traditional PE training in reducing lumbar pain of patients with chronic LBP. Furthermore, Joba-CT improves disability more than PE in these patients.

Short- and Medium-term Effectiveness of Hyperthermia for Knee Osteoarthritis

A. Rabini, A. Sgadari, S. Paravati, G. Tancredi, C. Nigito, C. Foti, L. Maggi, P. Ferrara, A. Specchia, G. Ronconi, D.B. Piazzini, C. Bertolini. *University Tor Vergata, Rome*

Introduction. To identify changes in quadriceps starkness, joint pain and functional ability in patients with knee osteoarthritis (OA) after induction of deep Hyperthermia with short wave diathermy sessions. **Materials and methods.** Subjects with symptomatic knee OA (n 26) were randomized to 2 treatment groups: Hyperthermia (HG) or hot pack (HPG) group. Quadriceps starkness (BMRC), joint pain (VAS) and functional impairment (WOMAC) in the index knee were measured at baseline, at the end of the treatment, 1 and 3 months after the intervention. **Results.** After the intervention HG reported a 17% increase in BMRC (p= 0,014), a 52% decrease in mean WOMAC (p=0,001) and a 38% decrease in VAS pain score (P = 0,011) relative to baseline. Those in the HPG reported a 12% increase in BMRC (p= 0,059), a 12% decrease in WOMAC (p=0,162) and a 20% decrease in VAS pain score (p=0,065) relative to baseline: in no instances statistical significance was reached After the treatment, only the WOMAC score was significantly different between the 2 groups (p= 0,010). **Conclusion.** Our results demonstrates that the induction of deep with short-wave diathermy is not BMRC nor VAS scores effective in reducing functional impairment of patients with Knee OA. However, given the lack of statistical power of our study, further investigations are needed .

References

Giombini, V. Giovannini, Noriko Ichinoseki-Sekinek, M. Shiraishi, Hisashi Naitok, and Nicola Maffulli, Hyperthermia induced by microwave diathermy in the management of muscle and tendon injuries , *British Medical Bulletin* 2007; 83: 379-396
 P. Creamer, M. C. Hochberg, Osteoarthritis, *Lancet* 1997; 350: 503-09

Comparison between corticosteroid sub-acromial injections and shoulder Hyperthermia. Valuation on pain and functional status of patients with rotator cuff tendinopathy : a single-blind, randomized, controlled trial

A. Rabini, A. Sgadari, S. Paravati, G. Tancredi, C. Nigito, C. Foti, L. Maggi, P. Ferrara, A. Specchia, G. Ronconi, G. Milano, M.F. Saccomanno, D.A. Santagada, C. Bertolini, D.B. Piazzini *University Tor Vergata, Rome*

Introduction. To compare improvements in pain and functional status of patients with rotator cuff tendinopathy after corticosteroid sub-acromial injections and induction of deep Hyperthermia with short wave diathermy. **Materials and methods.** A group of 37 patients with sintomatic rotator cuff tendinopathy was randomized to 2 treatment groups: corticosteroid sub-acromial injections (n=21), or induction of deep Hyperthermia(n=16) . Quick-DASH, Constant-Murley scale, and VAS were measured at baseline, at the end of the therapy, and after one month. **Results.** The corticosteroid Injections group reported an improvement of 22% (p<0,001) at the quick-Dash, of 20% (p<0,001) at the Constant-Murley, and of 32% (p<0,001) at the VAS. The Iperthermia group reported a similar improvement with a 20% (p<0,001) at the quick-Dash, 19% (p<0,001) at the Constant-Murley, and of 20% (p<0,001) at the VAS. **Conclusion.** This pilot study was insufficiently powered to asses weather corticosteroid injections or deep Hyperthermia shows better improvements in the treatment of rotator cuff tendinopahty. Since deep Hyperthermia has different drawbacks other than Cortisone injections, and given the analogue changes in functional status and pain relieve in the two studied group, deep Hyperthermia merits further scientific investigation as a treatment modality for patients with shoulder pain.

References

Van der Windt DAWM, Koes BW, Deville W, Boeke QAJP, de Jong BA, Bouter LM. (1998) Effectiveness of corticosteroid injections versus physiotherapy for treatment of painful stiff shoulder in primary care: randomised trial. *British Medical Journal.* 317:1292-1296.
 Giombini A, Di Cesare A, Safran MR, Ciatti R, Maffulli N. (2006) Short-term effectiveness of hyperthermia for supraspinatus tendinopathy in athletes: a short-term randomized controlled study. *Am J Sports Med.* 34:1247-53.
 Di Cesare A, Giombini A, Calcific tendinopathy of the rotator cuff. Conservative management with 434 Mhz local microwave diathermy (hyperthermia): a case study., 2008.

Assessment of upper limb robot-aided rehabilitation in chronic hemiparetic patients: a biomechanical approach

S. Mazzoleni¹, R. Crecchi², M.C. Carrozza¹, F. Posteraro²
¹*Scuola Superiore Sant’Anna, Pisa, Italy;*
²*Neurological Rehabilitation Unit, Auxilium Vitae Rehabilitation Center, Volterra, Italy*

Introduction. Different robotic systems for rehabilitation of the upper extremities in neurologically impaired subjects were developed [1]. Recent systematic reviews showed that upper limb robot-aided rehabilitation treatments in chronic hemiparetic patients improve short- and long-term motor control [2]. A method based on biomechanical parameters for the assessment of motor performances of such patients is presented. **Materials and methods.** Seventeen chronic hemiparetic subjects were included in the study, having suffered the acute event at least a year prior to the experiment. A group of five healthy subjects was recruited for comparison purposes. The InMotion2 robotic system (Interactive Motion Technologies, Inc., Boston, MA, USA) was used [3]. In each session subjects received 45 minutes of robotic training, 3 sessions per week for 6 weeks. Outcome measures: 1) Chedoke-McMaster Stroke Assessment Scale, 2) Motor Status Scale, 3) Passive ROM, 4) Modified Ashworth Scale and 5) elbow active extension. Seven different biomechanical parameters related to the mean force direction were computed. **Results.** The results from outcome measures show a statistically significant decrease in motor impairment in the paretic upper limb after the treatment. Among the different combination of pairs direction/parameter, the t-test performed on the difference between admission and discharge resulted in a statistical significance for the parameter “skewness” in the direction from the centre to the north target (p<0.005) and from the south target to the centre (p<0.05). **Conclusion.** The study presented an innovative assessment method based on biomechanical parameters computed on force data recorded during the robot-aided upper limb rehabilitation in chronic hemiparetic patients along with experimental results.

References

1. Riener R. et al., *Med Biol Eng Comput*, 2005, 43:2-10.
 2. Kwakkel G. et al., *Neurorehabil Neural Repair*, 2008, 22(2):111-121.
 3. Krebs H.I. et al., *IEEE Trans Rehabil Eng*, 1998, 6(1):75-87.

Cough Assist Mechanical Insufflator-Exsufflator Machine in Neuromuscular Patients in a Rehabilitation Ward

M. Mantellini, L. Perrero, A. Bottazzi, V. De Michelis, L. Bruni, M. Meloni, S. Petrozzino
Department of Rehabilitation, “Borsalino Rehabilitation Centre”, “S.S. Antonio e Biagio” Hospital, Alessandria, Italy

Introduction. Respiratory infections are the most common cause of hospitalization and the most severe complication of patients with neuromuscular diseases. An important cause of infection is the stagnation of deep bronchial secretions due to a deficit of cough. The peak cough expiratory flow (PCEF), a direct indicator of cough efficiency, is always reduced. It presents a weakness of respiratory muscles and a reduced compliance of chest wall with formation of pulmonary atelectasis. The adults PCEF value is normal if greater than 360 L/min. The minimum level to consider an effective cough is 160 L/min. The Cough Assist Mechanical Insufflator-Exsufflator (M.In-Ex) machine is a non invasive therapy that safely and consistently reduced the problems related to an ineffective cough. The M.In-Ex machine is considered efficacy to remove secretions in patients with neuromuscular diseases with a PCEF<270 L/m. **Materials and methods.** We submit to M.In-Ex a heterogeneous group of patients affected by neuromuscular diseases (myopathies, neuropathies, spinal cord disorder, etc.). Neuromuscular diseases, independently from the etiopathogenesis, have a similar natural history with three main conditions: 1.reduction of strength of respiratory muscles, 2.restrictive respiratory syndrome and 3.deficit of cough. We focus on cough deficit using a Cough Assist (M.In-Ex) machine registered by “Philips Respironics” in patient with a PCEF<270 L/min. The machine gradually apply a positive pressure to the airway followed by a rapid shifting to negative pressure simulating a natural cough. We repeated 3 cycles daily through facial mask or an tracheostomy tube adapter starting with inspiratory pressures of +10cmH₂0 and expiratory pressures of -10cmH₂0 to allow an acclimation period to the device. We mainly use auto mode, towards manual, setting the inhale and exhale time to 2-3 second each. The pressures is upward with subsequent treatments by 5cmH₂0 each

cycle until optimal pressures to clear secretions. We works with optimized inhale pressures from 15cmH₂O to 40cmH₂O and exhale pressure vary between 35cmH₂O and 45cmH₂O. A standard treatment consists of applying 4-6 consecutive cycles of insufflation/exsufflation. Visible secretions are removed via suction from mouth or tracheostomy tube. **Results.** We observe a reduction of respiratory infections using a M.In-Ex machine. Besides we collect information from patients that the cough assist improve the perceived quality of life due to a reduction of acute respiratory failure episodes. **Conclusion** Cough Assist In Exsufflator Machine can prevent complications as infection or acute respiratory episodes in patients with neuromuscular disease with an ineffective cough with a related improved quality of life.

References

1. Bach JR. Eur Respir J. 2003; 21:385-386.
2. American Thoracic Society (ATS) clinical practice guidelines and Cough Assist in neuromuscular disease.
3. Winck JC, et al. Chest. 2004;126:774-780.
4. Miske LJ, et al. Chest. 2004; 125:1406-1412.

Analysis of rehabilitative cardiorespiratory needs in functional area 4 of Piemonte region

S. Petrozzino, V. De Michelis, E. Mantellini, L. Perrero, N. Vivaldi

Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy

Introduction. The Alessandria and Asti ASL population, functional area 4 (FS4), according to 2007 figures of Piemonte region demographic database, was 316.269 male and 338.190 female. Estimating an average of 4,2 beds for 100.000 residents, area FS4 ought to have 26 beds for cardiorespiratory diseases. Actually, rehabilitation needs are much more and similar to those of some regions like Trentino (about four times). **Materials and methods.** SDO Diagnosis, for the selection of causes of admissions to hospital, is based on the ninth review of the ICD 9 CM. The database is made up of 794658 cards according to the files about the Piedmont Hospital admissions. **Results.** In 2006 because of cardiovascular diseases there were 61571 hospital admissions among men and 48927 women, and 10209 admissions for ASL AL and AT. For Respiratory diseases based on a regional total amount of 28434 male and 21500 female in ASL AL and AT have been hospitalized 4354 male and 3427 female; 3848 cerebrovascular cases have to be deducted from the total amount; so as the total amount was 14472 hospital admissions for cardiovascular and 7781 for respiratory causes. **Conclusion.** These hospitalizations represent a mix case of several complex diseases. This requires a particular evaluation. We can evaluate a need of rehabilitative hospitalization about 10% (2253), so we need more beds. If we consider that a perfect rehabilitative hospitalization is about 28 beds guarantees a treatment of 650 patients a year with an hypothetical employment rate of 100%, we would need about 100 beds, much more than those scheduled; unfortunately these forecast is not easy to realize with a poor budget. We need to think about the empowerment of the doctor's office setting, in order to fulfil this needs without forgetting the secondary prevention and empowering of the instruments to reduce the cardiovascular risk.

References

1. Riorganizzazione delle attività riabilitative della Regione Piemonte - Prime direttive alle Aziende Sanitarie Regionali. DGR Piemonte 2 aprile 2007.
2. Petrozzino S., Mantellini E., Perrero L., La riabilitazione della persona cardiopatica: 8 Punti Chiave da sviluppare nei prossimi 3 anni. Eur Med Phys 2009; 45 (Suppl.1 To N°3).

A year of Customer satisfaction results in cardiorespiratory rehabilitation

V. Demichelis, E. Mantellini, L. Perrero, S. Petrozzino

Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy

Introduction. The clinical studies have revealed that the clients never evaluate the professional complete service, but only particular aspects that put together in a global judgement, and all the consumer use similar criteria to evaluate the quality. These ones are considered as important factors of the perception of the quality service: relationship and quality of the assistance. **Materials and methods.** The form of customer satisfaction has been used to monitor the improvement of the clients' satisfaction and given out to all the hospitalized patients with the request to hand out the day of their discharge. We have chosen a balance scale of categories between pro and cons.(score 1-5). **Results.** Thirty-One Out of 41 discharged patients gave back the form

and from the analysis done we have noticed that to fill up the form in 22 cases was the patient, and in the other cases one of the relatives or the care giver 20 patients arrived at the hospital advised by their general practitioner. The hospital admission was easy for 25 patients, not easy for 4, and two didn't answer. The orientation was good for 28 patients, not satisfactory for 2, only one didn't answer. Comfort during the hospitalization, valued as a good setting, has been acceptable for one, good for 15, and excellent for 15. The aspects regarding relationship and availability of the hospital physician have been considered excellent. **Conclusion.** The final results about the quality of the assistance has been pretty excellent and the satisfaction for the unit has been very good for 77 % of the patents. Regarding the "core" of the assistance, the medical services, the results has been almost excellent, both regarding the preliminary information during the admission and the respect of the privacy the information received by the physician about their illness, the information about the treatment and attitudes given after the hospitalization.

References

1. Art. 10 del D.Lgs 502/92.
2. art.14 del D.Lgs 502/92.
3. D.Lgs 229 del 19.6.99.
4. Circolare "Sacconi" del 27/04/93.

Report of one year activity in Cardiorespiratory Rehabilitation at The Borsalino's Hospital in Alessandria-Italy

V. De Micheli, E. Mantellini, L. Perrero, S. Petrozzino

Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy

Introduction. Piemonte Regional decree N.1065/07 claimed that in physiotherapeutic cardiological programs and course taking care is referred to the whole person and not only to the specific part of the body: the heart. The effective implementation of this practice has been applied since 7/1/2009 in Rehabilitative Borsalino Hospital, in Alessandria, where a rehabilitation unit program for cardiopathic people has started. **Materials and methods.** Since 7.1.2009 to 02.28.2010 N. 207 patients have been hospitalized in cardiorespiratory rehabilitation unit,(127 males, 80 women).Patients were from: Alessandria Hospital: Cardiosurgery(102) and cardiology ward(9),Respiratory ward(51 patients), Thoracic surgery(8). The others came from Tortona, Acqui Terme, Novi Ligure, Asti, and from Lombardia and Valle d'Aosta. The most important diseases were cardiovascular (111) and pulmonary (96). **Results.** None of patients has died. Four patients returned to the hospital where they had come from. The other ones returned to their normal family life.An aggressive approach to coronary main risk factors has been useful for a better prognosis and for a better quality of life for the patients(1). **Conclusion.** Cardiovascular diseases are the most frequent cause of death in The Western countries and one of the most important cause of disability. The Health and economic resources absorption due to the cardiovascular disease is the main cause of the Italian Health-care cost. The early taking care post-surgery requires to fill up a form, an instrument to screen and communication among the specialists. The cardiorespiratory unit, projected following regional guidelines dealing with patients with disability, taking care of these complicated patients, with a multidisciplinary approach assures the global taking care of the person, the reintegration to work and to a social life, and the reduction of patients emigration to extra regional hospitals.

References

1. Riorganizzazione delle attività riabilitative della Regione Piemonte-Prime direttive alle Aziende Sanitarie Regionali.DGR-Piemonte-2 aprile 2007
2. Petrozzino S.,Mantellini E., Perrero L.,La riabilitazione della persona cardiopatica: 8 punti chiave da sviluppare nei prossimi 3 anni. Eur Med Phys 2009;45(Suppl.1,N°3)

Secretion management in the invasive mechanically ventilated patient in a rehabilitation ward: the use of high frequency chest wall oscillation (HFCWO)

M. Mantellini, L. Perrero, A. Bottazzi, V. De Michelis, A. Gatta, S. Bona, S. Petrozzino

Department of Rehabilitation, "Borsalino Rehabilitation Centre", "S.S. Antonio e Biagio" Hospital, Alessandria, Italy

Introduction. Mechanical ventilator - a device designed to support or replace spontaneous respiration - is used in patients with acute respiratory crises and in long-term therapy in chronic hypo-

ventilation patients affected by respiratory or neuromuscular disease. When non-invasive ventilation is not indicated, placement of an artificial airway is mandatory: endotracheal tubes for short-term use and tracheostomy tube for long-term use. In the past Invasive Mechanical ventilation (IMV) was usually adopted only in intensive care unit. The most of patients receive short-term IMV therapy. However, some patients require long-term IMV with the use of an endotracheal tubes. A significant number these patients receive the treatment in high specialization rehabilitation wards reducing hospital costs. During IMV the presence of a foreign body is an important stimulus to increase secretions production. Besides, frequently is present COPD with a permanent increased secretion production. Often the subject are motionless with inefficient cough. These conditions increase the risk of pulmonary infections. From these clinical considerations emerges the importance of a correct management of the secretions. The high frequency chest wall oscillation (HFCWO) can be an effective instrument to remove the secretions in the deepest zones of lungs. **Material and method** The HFCWO is an effective device to remove secretions in patient collaborating and not during the IMV. To introduce the HFCWO in our ventilated patients we use the VEST devices, an airway clearance system registered by Hill-Rom. In patients with cough deficit after the treatment with VEST we make follow a Mechanical In-Exsufflator (M-I-E) treatment. During the IMV we alternate brief treatments of VEST (2 minutes) repeated at least 2 – 3 times a day with a frequency of 10-15 Hz to the use of the M-I-Exsufflator (3-4 cycles) followed by aspiration with suction catheter. We observe the possibility that VEST treatment during the ventilation interferes with the analysis of pressure and aerial flow of the ventilator modifying incorrectly the data of these parameters. **Result:** We observe that long-term IMV patients submitted to HFCWO associated to M-I-Exsufflator and manual CPT present a more effective airway clearance of bronchial secretion than only manual CPT, improving negative inspiratory force over time, reducing lung infections and in some few subject liberating earlier from ventilator support. **Conclusion** The mobilization of the secretions in invasive mechanical ventilated patients (IMV) with high frequency chest wall oscillation device (HFCWO) associated with the In Exsufflator machine (In-Ex M) reduce the incidence of infections and the necessary time to depend from a mechanical ventilation.

References

- Diette GB, Rand CS, Wise RA, Thompson K, Merriman B. Feasibility of using a sham control device in clinical trials of High Frequency Chest Wall Oscillation (HFCWO) in COPD. *Am J Respir Critical Care Med* 2004;167:A613
- Piquet J, Brochard L, Isabey D, De Cremoux H, Chang HK, Bignon J, Harf A. High Frequency Chest Wall Oscillation in patients with chronic airflow obstruction. *Am Rev Respir Dis* 1987; 136: 1355-1359.
- Perry RJ, Man GCW, Jones RL. Effects of positive end-expiratory pressure on oscillated flow rate during high frequency chest compression. *Chest* 1998; 113(4): 1028-1033.
- Ndukwu IM, Shapiro S, Nam AJ, Schumm PL. Comparison of High Frequency Chest Wall Oscillation (HFCWO) and manual chest therapy (MCPT) in long-term acute care hospital (LTAC) ventilator- dependent patients. *Chest* 1999; 116(4 Suppl 2): 311S.
- Whitman J, Van Beusekom R, Olson S, Worm M, Indihar F. Preliminary evaluation of high frequency chest compression for secretion clearance in mechanically ventilated patients. *Respir Care* 1993; 38(10): 1081-1087.
- Klous DR, Boyle M, Hazelwood A, McComb RC. Chest Vest & CF: better care for patients. *Adv Mgrs Respir Care* 1993; 2(3): 45-50.
- Chang HK, Weber ME, King M. E. Mucus transport by high frequency nonsymmetrical oscillatory airflow. *J Appl Physiol* 1988; 65(3): 1203-1209.

Patient fall reporting system in Hungary

E. Boros¹, É. Belicza², G. Fazekas¹, D. Zoltán¹

¹National Institute for Medical Rehabilitation, Budapest, Hungary

²Semmelweis University Health Services Management Training Centre, Budapest, Hungary

³Szent János Hospital and National Institute for Medical Rehabilitation, Budapest, Hungary

Introduction. Patient falls are the most frequent adverse events, which affect the cost and quality of patient care in hospitals. In order to identify main causes and high risks of these unwanted events, in Hungary three years ago an investigation started to collect nationwide reports of circumstances of inpatient falls. The aim of this study was to analyse the first thousand reports. **Materials and methods.** Reporting questionnaire was developed in the frame of NEVES patient safety project with collaboration of co-workers came from seven Hungarian hospitals and this work was organised by Semmelweis University Health Services Management Training Centre and Hungarian Hospital Association. Data provision is voluntary and anonymous. We got data from several hospitals through the online adverse event reporting

system. In this study data collected from 01.07.2007-31.12.2009 were analysed. For statistical analysis SPSS for Windows was used. **Results.** A total of 1020 fall reports performed during the study period (434 men and 534 women). The largest proportions of patients falls were in the patient's room (75%), near by their bed (43,5%), or set out to bathroom or toilet (31,5). Only 11,9% of falls actually occurred in the patient's bathroom. Most of fallers had an unassisted fall. 32,7 % of falls occurred at night (between 21-05 hours). Lost balance was the most common (55,6%) cause of the fall mentioned by nurses. 30,9 % of falls related to incontinence, 23,6% of patients was disoriented, and 15,6% of them had visual, while 16,2% speech problem. Overall, 50,3% of the 1020 falls resulted in some type of injury, 4,6% falls involved severe injury. **Conclusion.** Our results are very close correspondence with other review in this topic. The NEVES data reporting system is available tool in exploration of causes leading to inpatient falls and may play an important role in patient safety. On the base of these datas we are planning to work out recommendations for the fall risk assessment and to develop and carry out appropriate information and education depending on the risk.

References

- Hitcho E.B., Krauss MJ et al: Characteristics and Circumstances of Falls in a Hospital Setting A Prospective Analysis *J Gen Intern Med.* 2004 July; 19(7): 732-739.
- Boros E.: Role of environmental factors in patient falls. *Int.J.Rehab.Res.* 2009.Vol32, Suppl.1./111.

Application of the constraint-induced movement therapy modified in children with disabilities – EMG analysis of muscle recruitment

Sicari², D. Caramma¹, Commodari³, C. Sergi¹, M. Manoli³, A. Faranda¹, M. Origlio¹, C. Dipietro³, M. Sci¹, T. D' Erario¹, S. Verzi^{1,3}

¹Associazione J F Kennedy Centro Di Riabilitazione Sedi Adrano

^{1,2}Acireale

²Azienda Ospedaliera San Giorgio (Ferrara)

^{2,3}Catania

Introduction. The Constraint-induced movement therapy (CIMT) is an innovative method of neurorehabilitation (1) that in the last 15 years has accumulated a lot of scientific evidences on the rehabilitation of the paretic arm in the patients with recent stroke. This therapy compels patient with outcomes of recent stroke to use paretic limb, immobilizing the healthy limb and effecting intense rehabilitation on the paretic limb. (2) With the present study we would like to try to adapt principles of CIMT to children with disabilities and to determine if they improved hand function and underlying muscle activation changes. **Materials and methods.** It's a pilot study with 4 children with CP or peripheral disabilities participated in the study, receiving 2 hours of therapy 6 days a week coupled with bivalve casts worn 8-12 hours for 15 days. They often continue treatment on a less intensive basis when the CIMT ends. This is usually 1-2 times per week in individual treatment for 4 weeks. Outcomes measures of ability test, grip strength, pinch strength, mental test and EMG were compared before, immediately (2 weeks), at 4 weeks, and 3v months post-intervention. **Results.** CIMT group showed good improvements in clinical test and mental practises test. EMG analysis showed increases in muscle activation during grip and decrease during dexterity tasks. **Conclusion.** Our pilot study support CIMT for improving hand skills in children with disabilities. EMG is a good analysis method to measure muscle activation during CIMT intervention.

References

- Blanton Sarah, Steven L.Wolf: An application of upper-extremity constraint-induced movement therapy in a patient with subacute stroke. *Physical Therapy* 1999;79: 847-853.
- Dromerick A., Edwards D.E., Hahn M.: Does the application of constraint-induced movement therapy during acute rehabilitation reduce arm impairment after ischemic stroke? *Stroke* 2000; 31: 2984-2988.

Clinical work developed in a rehabilitation centre during the year 2009

A. Pereira, J. Laíns, P. Margalho, C. Noronha, P. Amorim, J. Almeida, I. Lucas, G. Beça, P. Figueiredo, S. Santos, J. Branco.

Centro de Medicina de Reabilitação Região Centro - Rovisco Pais

Introduction. The periodic and systematic study of the clinical activity is crucial to evaluate methodologies, procedures and treatment efficacy, and thus take actions for continuous improvement. This retrospective research analyzes the inpatient medical activity in a Medical Rehabilitation Center during 2009. **Materials and methods.** The

Functional Independence Measure (FIM) was used in patients on admission and discharge during the year 2009. It was characterized age, gender, and functional diagnostic groups: stroke, cerebral dysfunction, other neurological diseases, amputation, spinal cord injury and multiple trauma using the classification GFL (*Groups of Functional Limitation*). The data were statistically analyzed using SPSS, version 17.0 for Windows. **Results.** 144 patients were discharged, 98 (68.53%) male and 45 (31.47%) female. The average age was 53.27 years and the average in hospital stay (LOS) of 96.81. The most frequent GLF categories were: stroke with 37.76% (n=54), spinal cord injury with 32.87% (n=49), brain dysfunction with 13.29% (n=9). The average FIM on admission was 73.78 and of 93.5 at discharge. The average FIM gain (FIM discharge - FIM admission) was 19.32. The average FIM gain per day (FIM-gain/day) is higher in stroke (0.362) comparing with brain dysfunction (0.217) and with SCI (0.154). Age was negatively correlated with FIM at admission but not with FIM at discharge. **Conclusion.** Functional improvement, measured by FIM, was similar to the records presented by the literature. However, the FIM-gain/day is significantly smaller, which is a stimulus to optimize procedures and gain efficacy.

References

- Keith RA, Granger CV, Hamilton BB, Sherwin FS. The functional independence measure: a new tool for rehabilitation. *Adv Clin Rehabil.* 1987;1:6-18.
 Linacre JM, Heinemann AW, Wright BD, Granger CV, Hamilton BB. The structure and stability of the Functional Independence Measure. *Arch Phys Med Rehabil* 1994; 75:127-132.
 MossRehab.com. Philadelphia 2010 [assessed in 2010 Feb 08]. <http://www.mossrehab.com>

Botulinum toxin a injection to pectoralis minor muscle in a patient with venous thoracic outlet syndrome

G. Erden¹, D. Palamar¹, K. Akgün¹, F.Kantarç², L. Özçakar³

¹Istanbul University Cerrahpaşa Medical School, Dpt. of PRM

²Istanbul University Cerrahpaşa Medical School, Dpt. of Radiology

³Hacettepe University Medical School, Dpt. of PRM

Introduction. Thoracic outlet syndrome (TOS) is the constellation of findings that ensue due to compression of the neurovascular structures in the cervicoaxillary region. It is generally classified as neurogenic (true and disputed) and vascular. Isolated venous compression is quite rare. Herein, we report about a patient with venous TOS in whom botulinum toxin injection to pectoralis minor (PM) muscle was successfully performed after conservative treatment failed to improve her complaints. **Case report.** A 27-year-old female was seen for pain, paresthesia and discoloration in her left upper limb for the last 2 years. On detailed questioning, she declared that her complaints had started after a whiplash trauma and that they occurred especially during overhead activities. Physical examination of the cervical and shoulder regions were unremarkable. Neurological examination was normal. Roos test was positive on the left side. Laboratory and electrodiagnostic tests were also noncontributory. Doppler ultrasonography and magnetic resonance angiography revealed severe compression of the axillary-subclavian vein between the PM muscle and the subclavian artery. Accordingly, the patient was diagnosed as venous TOS. After 6 weeks of physical therapy failed to improve her complaints, 75 U botulinum toxin A was injected to PM muscle under sonographic guidance. A 50% decrease was achieved in her complaints at the end of the 3rd week. She also underwent surgery whereby first rib resection and release of scalene and pectoralis muscles were performed. She was completely normal at control visits and repeat doppler sonography showed no compression during neutral and dynamic positioning. **Conclusion.** It is noteworthy that botulinum toxin injection can be used in TOS patients irresponsive to conservative therapy as an alternative interventional treatment method. Further, in case of an onward surgery, its results may also guide surgeons concerning the exact surgical technique to be used.

Euroaspire III Romania follow-up: role of general practitioner in smoking cessation

D. Stancila¹, L. Craciun², S. Iurciuc², M. Iurciuc², C. Avram⁴, A. Avram², C. Ciulacu³, D. Gaita²

¹Municipal Clinical Hospital, Dept. Internal Medicine, Timisoara, Romania

²University of Medicine and Pharmacy Timisoara, Romania

³The Emergency County Hospital, Dept. of Psychiatry, Timisoara, Romania

⁴University of West, Timisoara, Romania

Introduction. Evaluating the role of general practitioner in cardiovascular prevention by supporting smoking cessation in asymptomatic

high risk patients included in the first Euroaspire III Romania Follow-Up. **Materials and methods.** We followed-up 325 patients out of 503 asymptomatic high risk patients included in EuroAspire III Romania Primary Care. These patients were evaluated every 6 months for a period of 18 months of follow-up by general practitioners that have been advised to reinforce lifestyle changes. We selected 46 smoking patients (age 51,93±8,84 years, 32.6% women) in which we evaluated their compliance to GP recommendations. **Results.** At the time of inclusion, the majority of patients never smoked (NS) and 14.2% were active smokers (AS) and 16% have quit smoke (FS). More than a half of AS (69.5%) used to smoke 6-20 cigarettes/day while 10.9% smoked more than 25 cigarettes/day. AS performed a higher score for severe anxiety (4,3%) than NS (1,9%). Although all smokers should receive recommendation of quit smoking, only 69.6% received a minimal advice from their general practitioner prior their inclusion in the study. After 18 months, 43.5% quit smoking while 56.5% continued to smoke. Although similar antihypertensive treatment was applied to both groups (AS and NS), after intervention period, a significant improvement in DBP control was observed only in NS (84,56±10,8 mmHg vs 77,22±8,62 mmHg, p<0.05). **Conclusion.** Even if smoking continues to be the leading preventable cause of cardiovascular disease, only 69.6% of active smokers with high individuals risk for cardiovascular disease received advice for smoking cessation; their compliance to this recommendation was about 50%. The data highlighted that it is a strong need to intensify preventive intervention in primary care and there are still barriers that need to be cross regarding patients, sanitary system and physician.

A psychiatric screening assessment in an institutionalized adult population with mental retardation and neurological impairment

?????

?????

Background and Purpose. Periodic psychiatric valuations are frequent when mental retardation with neurological impairment occurs in people during the age of development. When they reach adulthood or old age such monitoring activity is often considered useless or impossible. **Materials and methods.** "Opera della Provvidenza S. Antonio" is a residential institution for mentally retarded people with neurological impairment where about 500 people live. In October 2006 we started a psychiatric screening of the population. From October 2006 to December 2009 there where 624 people in the home (average age = 54,4; SD = 13,53; Range = 0,4-98,9). Up to December 2009, 251 patients were examined by a psychiatrist (average age = 55,1; SD = 15,2; Range = 6,4-98,1); 186 of them were examined once, 42 twice, 15 three times, 7 four times and 1 six times. The reasons which led to a psychiatric examination were: in 132 cases, screening of people who had been living in the home for a long time; in 115 cases, new pathological events; in 57 cases, control examination and in 45 cases the newly admitted. **Results.** Only 16 psychiatric examination out of 349 (4,48%) had no prescription whereas for the other 333 examinations the physician prescribed an amount of 807 interventions: 168 individual physiotherapy treatments, 150 indications for postures, 101 prescriptions for prostheses and aids; in 87 cases the physician demanded further investigations; in 38 cases a pharmacologic treatment was prescribed, in 16 a multi-professional treatment and in 15 a logotherapy intervention. In 81 cases the ongoing treatment was confirmed. **Conclusion.** The outcome of such practical knowledge proves that continuous psychiatric monitoring is possible and useful for people with mental retardation and neurological impairments furthermore, in more than 95% of the examinations, it leads to implement further investigation and new rehabilitation treatment or to confirm the ongoing treatment.

Test for functional outcome of soccer players after ACL reconstruction at the end of assisted rehabilitation

F. Danelon, D. Pisoni

Isokinetic Medical Group, Milan, Italy

Introduction. The goal for soccer players after ACL reconstruction is return to full athletic activity. Subjective criteria are usually used to decide when patients can return to competitions. To give consensus to return we used a battery of tests and compared results with data obtained in a previous study (1). Aim of the study is to evaluate

retrospectively results at the end of rehabilitation in order to improve treatment. **Materials and methods.** We studied 37 male players, aged less than 45 ys, submitted to ACL isolated surgery, and full treated for rehab in our centre between 2005 and 2009. Patients were divided in two group based on surgical reconstruction technique: BPTB group (20 players) and St-Gr group (17 players). Parameters measured are time from surgery to field test, running speed at anaerobic threshold, strength with single leg hop test (SLHT) and triple one leg hop test (THT), expressed as Limb symmetry index (LSI), ball passing accuracy with "long passing test" (2). **Results.** Our study evidenced no difference between groups in time passed from surgery to test, in SLHT, TLHT and "long passing test. In running speed at anaerobic threshold both group results were significantly lower than values of healthy group. **Conclusion.** When the rehabilitation is considered fully completed on observational evaluation, the aspect that objectively doesn't appear full recovered is athletic condition.

References

1. Danelon F et al. Objective reference values for assessing functional recovery after injuries in amateur soccer players. *Med Sci Sports Exercise* 37, 5 Suppl, 2005.
2. Rosch D et al. Assessment and evaluation of football performance. *Am J Sports Med* 28, No 5, S 29-39, 2000.

Case report: diagnosis and proposal of rehabilitative treatment in a patient with hysterical dysphonia

S. Damiani, M. Ranieri, A.P. Amico, R. Cortese, M. Megna, G. Megna *Physical Medicine and Rehabilitation Unit, Neurological and Psychiatric Sciences Department, Aldo Moro University, Bari, Italy.*

Introduction. The dysphonia is a disorder of voice that may have different causes, both organic and functional. The organic causes are traumatic, infective or neoplastic lesions of the larynx or of the nervous system which activates its muscles, either at a central level or at a peripheral level. The non organic dysphonia generally depends upon psychological diseases, in demonstration of the fact that the voice is strictly connected with the mind and the behaviour.

Materials and methods. In our study we analyze a patient with dysphonia who suffers, not casually, from another psychosomatic disease (fibromyalgia) and has an already defined pattern of depression of the mood. This analysis is aimed to find out a protocol for diagnosis and treatment of hysterical dysphonia. As to the diagnosis, we think that it is important to exclude all organic causes of dysphonia, so the patient undergoes to clinical and instrumental evaluations. As to the treatment, we try to associate physiotherapy (electrical stimulation of the throat) with specific training of the voice, adjusting the psychiatric therapy too. **Results.** We had good results with this integrated treatment, both as to the voice and as the mood and the quality life of this patient. **Conclusion.** Like in other fields of rehabilitation, a team is necessary in order to apply harmoniously different kinds of therapy with the best benefit on the patient.

References

1. Bauer H H. Definition of psychogenic voice disorders, *Laryngorhinotologie*, 1991 Feb, 70(2): 102-4.
2. Behrendt S, Hess M M. Psychotherapeutic care of dysphonic patient, *HNO*, 2004 Jul; 52(7): 642-7.
3. Puelz J, Schuetzenberger A, Graessel E, Koellner V, Eysholdt U, Rosanowski F, Satisfaction of dysphonic patients: psychosomatic assessment and intervention, *HNO* 2009 Sep, 57(9): 902-9.
4. Mans E J, The psychosomatic interview in diagnosis of functional voice disorders, *Folia Phoniatri (Basel)*. 1993;45(3):105-11.
5. Sudhir PM, Chandra PS, Shivashankar N, Yamini BK, Comprehensive management of psychogenic dysphonia: a case illustration, *J Commun Disord*. 2009 Sep-Oct;42(5):305-12. Epub 2009 May 4.
6. Butcher P, Psychological processes in psychogenic voice disorders, *Eur J Disord Commun*, 1995; 30(4): 467-74.
7. Seifert E, Kollbrunner J, Stress and distress in non-organic voice disorders, *Swiss Med Wkly*. 2005 Jul 9;135(27-28):387-97.

Will an electronic form help the information exchange among professionals? Experimental study on the communication between nurses and physiotherapists in the case of neurologic patients

????
 ????

Introduction. The goal was to verify the improvement of the communication between physiotherapists and nurses by introducing a dedicated form into the network folders. **Materials and methods.**

In the first part of the study, physiotherapists and nurses were asked to evaluate the exchange of information and to point out their information needs about patient who is in a rehabilitation process. The collected needs were used as a starting point for the creation of two patient forms. A first one was dedicated to nurses, a second one to physiotherapists. Both would be inserted into the clinical records of the patient, which are still in a paper form. The form was created with Patidok software and could be filled out in 90 seconds both when printed out and when filled out from a PC. Nurses and physiotherapists were asked to fill out the form daily, for a total period of 3 months. Later on, a feedback form was filled out. **Results.** The form performance was rated as very useful by the interviewed professionals, but was classified as difficult by 50% of physiotherapists and 75% of nurses. The need for information is based on the physiotherapist's necessity for continuous updates on the general conditions of the patient, while for the nurse it is important to know the degree of collaboration, movement and transfer. The form was filled out by the physiotherapists on 93% of the days, but by the nurses only on 66% of the days because of the lack of time to dedicate to it for 17 out of 20 nurses. No critical feedback was provided. **Conclusion.** The information exchange process is very important for the professionals, who consider it as a high priority for their performance. Even though the users had difficulties in filling out the form, the form will not be changed, but the users will be motivated to fill it out.

Group treatment for patient with chronic low back pain: 10 or 20 session exercise programme?

????
 ????

Introduction. Some authoritative sources in literature suggest to prolong the rehabilitative treatment for patients with chronic low back pain well beyond the traditional 10 session. We have, therefore, started a study to evaluate the effectiveness of a group treatment program with 10 and 20 sessions and, in parallel, recorded the compliance of the same patients. **Materials and methods.** 34 patients, 15 male and 19 female, affected by chronic low back pain (since more than 6 months) have been consecutively recruited with an average age of 45 years (24-74 range). Criteria to be excluded were the contemporary presence of other severe pathologies, the spondylolysis and spondylolisthesis, or their need to carry out other treatments at the same time. The treatment program, lasting 20 biweekly 1-hour-sessions, is based on the Feldenkrais's method associated with a cognitive behavioural treatment. It has been run by the same physiotherapist. Physical disability and pain have been evaluated at the beginning, after 10 and after 20 sessions through two questionnaires: the Back Ill (BI) and the Roland and Morris Disability Questionnaire (RMDQ). In the BI a change larger than 15%, both toward improvement or worsening, is considered significant. **Results.** Out of the 34 patients, screened within the study, 23 (equivalent to 68%) have carried out 10 sessions, 19 at least 17 and 7 (15%) have stopped after 5 sessions (1-8). The differences between the results of the BI test after 10 and 20 sessions have not shown any statistical relevance. The RMDQ have not shown statistically significant differences between the tenth and twentieth session. **Conclusion.** In spite the poorness of the statistical sample, we have to reconsider whether it is the case or not to extend the cycle beyond the tenth session. The compliance among patients is good, as the abandonment takes place well before 10 sessions.

Un esempio di collaborazione per il turismo inclusivo: la valutazione dell'accessibilità ai passeggeri nel Porto di Venezia

C. Massaro, P. Tonin., F. Sensini, C. Gallo, N. Gianotti
 ????

Background. Taking in consideration the worldwide problem to permit the full accessibility to the centre of the historical city, avoiding any limitation in the participation of people with disabilities and promoting the inclusive tourism, a research project on the Port accessibility for the passengers, inside the cooperation between IRCCS San Camillo and the Authority of Port of Venice, has been formalised. **Materials and methods.** In this project, both, the ship services, supplied by the shipping companies, and the front services, supplied by "Venezia Terminal Passeggeri", will be analyzed. **Aims.** The first aim

of the project is to establish a new model of organization and management of the offer to create an Accessible Port. The second aim is to share this new model with other ports, to achieve an uniform employment of this offer, by means of a procedures' standardization, until the feasible proposal of touristic packages with these features. **Discussion.** The project perspectives include: the enlargement of the accessibility to other disabilities over the motor one, such as cognitive, psychiatric and geriatrics disabilities; the possibility to create an embedded certification (quality/safety/environmental) of the specific paths/procedures; the enrichment of the specific utilities on board, such as the presence of health professionals for specific training; the comparison with other transport solutions. **Conclusion.** The city of Venice considering both its criticism and singularity looks as the best location to experiment adequate and innovative solutions.

New technologies of restorative medicine in ophthalmology

O. Yurova, A. Razumov, I. Bobrovnickey, G. Nazarova, T. Konchugova
The Russian Scientific Centre for Restorative and Resort Medicine, Moscow, Russia

Introduction. Carrying out of rehabilitation actions is shown at chronic inflammatory diseases of an eye and its additional device, glaucoma, retina defeats against such diseases, as hypertensive illness, an atherosclerosis, diabetes, at a pathology vitreous body, degenerate myopia, partial atrophy of an optic nerve various genesis and of some others. In restorative treatment patients require the early regenerative period after operative interventions on the eyeball, orbit and eyeball traumas, and after intensive treatment of sharp inflammatory diseases of the eye, hemorrhages into the eye. **Materials and methods.** There are the basic physical methods of treatment in "restorative ophthalmology": electrophoresis, magneto therapy, ultrasound therapy, laser therapy, local pressure therapy (infrasound), heat treatment and others. Now, at patients of an ophthalmologic profile physical factors are applied not only in complex treatment of chronic inflammatory processes, dystrophic diseases of the eye and their complications, but also as the basic method of preventive maintenance and correction of visual infringements with the accommodation infringements of the eye. **Results.** It is necessary to underline especially the role of the psychological help in system of complex of invalids' rehabilitation as even partial loss of sight, influences all structure of the person, leading to his disadaptation in the social plan. The main objective of the social and psychological rehabilitation - rendering to the persons having limited possibilities of ability to live, the psychological help and emotional support with a view of simplification of process of their active adaptation to new conditions of ability to live. **Conclusion.** Timely carrying out of the complex rehabilitation actions spent at early stages of the of disease's development, allows to lower level of primary physical inability on sight.

References

Ovechkin I., Bobrovnickey I., Shacula A. etc. - The restorative ophthalmology, - The monographs, - Moscow, -2006.

Evaluation of patients with gait abnormalities in PRM settings based on ICF, PRM Programme of Care

A. Delarque, L. Bensoussan, H. Collado, J.M. Viton
Pole of PRM, University Hospital, Medical School, University of the Mediterranean, Marseille, France

Introduction. Assessment of patients with gait abnormalities in physical and rehabilitation medicine settings. **Materials and methods.** Clinical examination based on the International Classification of Functioning, Disabilities and Health. Body structure, activities and participation, and environmental factors (physical and human factors) must all be assessed. Qualitative and quantified assessments of gait are part of the activity and participation evaluation. Scales are also used to assess gait activities. **Results.** To understand the underlying mechanisms and the aetiology of the disorders, to obtain quantified gait parameters, to define suitable therapeutic methods, and to follow the course of the disease. **Conclusion.** Clinical evaluation based on ICF leads to improving quality of life.

References

Evaluation of patients with gait abnormalities in physical and rehabilitation medicine settings.
Bensoussan L, Viton JM, Barotsis N, Delarque A., J Rehabil Med. 2008 Jul;40(7):497-507. Review.

Retrospective study on outcome of post-anoxic brain injured patients

A. Montis¹, G. Zani, S. Lavezzi¹, A. Bertocchi¹, F. Scano², N. Basaglia³
¹High Speciality Unit for Rehabilitation of Severe Brain Injuries – Department of Neurosciences/Rehabilitation, Sector of Rehabilitative Medicine "San Giorgio", Ferrara
²Department of Rehabilitation Medicine ULSS7, Conegliano Veneto (TV)
³Rehabilitative Medicine Unit, Department of Neurosciences/Rehabilitation, Sector of Rehabilitative Medicine "San Giorgio", Ferrara

Introduction. This study was performed to evaluate demographical, clinical and neurophysiological variables of a population of postanoxic brain injured patients (PABI). **Materials and methods.** In this retrospective study were included patients with postanoxic coma who underwent an inpatient rehabilitation program from 1974 to 2008. Datas collected from medical records were: Demographical (age and gender); Clinical (Long of stay, Levels of Cognitive Functioning-LCF admission/discharge, Functional Independence Measure-FIM admission/discharge, Glasgow Coma Scale-GCS, Glasgow Outcome Scale-GOS). **Results.** Subjects were 70 (mean age 53 years; St.D. 15,3), 50 males (72,4%) and 20 females (28,6%). The mean of inpatient rehabilitation long of stay was 108 days. On admission LCF mean score was 3, whereas at discharge was 4. FIM mean score on admission was 29,4/126, whereas at discharge was 41,9/126. The main outcome measure (evaluated by GOS) was an unfavorable (GOS 1, 2 and 3): 45,7%. **Conclusion.** According to previous studies, our results explain post anoxic brain injured patients have poor cognitive outcome: most of patients have severe disorders of consciousness, only few patients achieve to communicate their simple needs. As regards motor recovery, these patients remain dependent in activity of daily life and in transfers after discharge. Therefore, in our opinion rehabilitative interventions should be oriented towards caregivers training to manage and to supervise these chronic disabled patients at home.

References

1. Levy et al. Predicting Outcome From Hypoxic-Ischemic Coma. JAMA 1985; 253: 1420-1426
2. E. Zandbergen et al. Systematic review of early prediction of poor outcome in anoxic-ischaemic coma. Lancet 1998; 352: 1808-12
3. Pifferi et al. Early prediction of neurologic prognosis after post-anoxic coma. Intensive Care Med 1998; 535-536

Results of Physical Treatment in the Spa and Medicamentous Therapy on Muscle Strength and Trunk Mobility in Subjects with Lower Bone Density

S.K. Marković¹, R. Filipov¹, J. Jovanović², K. Amila²
¹Institute for treatment and rehabilitation of rheumatic disease "Niška Banja"
²Center of Medical Rehabilitation "Fojnica"

Introduction. Important parameters for functional assessment of muscles trunk are: quantification of muscle strength, range of motion and endurance. It is the most significant in prevention of falls and fractures in patients with lower bone mineral density. Isostation B200 is the three axial isoinertial dynamometer for the examining the musculature of the LS part of the spinal column. On this apparatus, we have analyzed values of the maximal isometric test, for the muscles both flexor and extensions of the trunk; then values of the average rotation moment, as well as, average speed in dynamic test in addition to the respective loading. On this apparatus it is also possible to monitor movements, simultaneous time registration, angles and speed in sagittal, frontal and transversal level. The aim of this investigation was to prove that positive effects of prescribed medications and physical therapy with suitable dynamic test, to patients with lower bone mineral density, leads to the increase of muscle strength and functional mobility. Measuring of bone mineral density was performed on the Lunar DPX, anteroposterior scan of the lumbar vertebra L1-L4 was performed by the method of the DXA. **Materials and methods.** 125 postmenopausal women with lower bone mineral density were included in the prospective study, and were treated with prescribed medication and physical spa therapy for six months. **Results.** In the group without therapy during six months with average T-score = -2,3 (BMD=0,897g/cm²) reduction in muscle strength and mobility in the LS part of the spinal column of 15,47% was noticed. The second group also with 25 patients and average T-score = -2,4 (BMD=0,886g/cm²) was treated with physical spa therapy. After six months, in this group muscle strength and mobility in the LS part

was increased by 17,92%, especially in contraction extensors by 28,43%. The third group with 50 patients and average T-score = -2,7 (BMD=0,860g/cm²) was treated with calcium and vitamin D3, besides physical therapy. After six months, muscle strength and mobility in the LS part in this group increased approximately as in the previous group. In the last group there were 25 patients with average T-score = -2,88 (BMD=0,835g/cm²) and the increase of muscle strength and mobility in the LS part was far more than 35%. This group was treated by calcium, vitamin D3, physical therapy and bisphosphonates. **Conclusion.** With the applied of the prescribed medication and physical spa therapy in subjects with the lower bone mineral density there is statistically significant increase of muscle strength and functional mobility in the LS part of the spinal column, independent of age, duration of the disease and the level of bone mineral density reduction. The results showed that bone mineral density, on one hand and muscle strength and functional mobility of the lumbo-sacral LS part of the spine, on the other hand, are objectively dependent.

New methods of restorative treatment of patients with cerebrovascular diseases

D. Penionzhkevich, F. Gorbunov

The Russian Scientific Centre for Restorative and Resort Medicine, Moscow, Russia

Introduction. Modern researches of neurochemistry testify to presence at preparations, as Dimephosphon and Mexidol properties of the membrane protector, capable to regulate of Calcium homeostasis, to reduce neurotoxic action of the raised concentration of exciting amino acids. **Materials and methods.** For strengthening of medicinal electrophoresis influence, we had been used methods of transcerebral and segmental reflex physiotherapy such factors as variable magnetic field and local d'arsonvalization, that has in turn helped to change pharmacological activity of the substances entered at electrophoresis and to raise clinical efficiency in surveyed groups. It was inspection of 80 patients at the age from 32 till 65 years. All patients received base therapy in the form of courses hydrokinezotherapy, massage and the general siliceous baths. **Results.** In the course of treatment similarities and distinctions of influence of studied complexes on clinic-neurologic displays have come to light, positive dynamics which was characterized by decrease in intensity of headaches, noise in ears, dizziness, improvements of structure of the dream was traced. By data of Dopplergraphy of extra cranial departments after a course of Dimephosphon and Mexidol electrophoresis in combination with d'arsonvalization there is the inclusion of collaterals, and also development of a cerebral haemodynamic reserve in pools of carotids at 77% of patients. **Conclusion.** There were positive shifts of electrolyte's indicators (Ca, Mg, P, Na) whey of blood after course of treatment. Normalization of the electrolytic blood structure in all groups is dependent proportional to the general changes of metabolism in fabrics, at the expense of increase in permeability of cellular membranes, reduction of processes lipid per oxidation and as consequence of it is restoration of the micro molecular link in the fabric metabolism.

References

Tolokonin A.O., Razumov A.N. - World improving systems in practice of restorative medicine, - Medicine, Moscow, 2007.

Physioalneootherapy methods in rehabilitation programs of patients with cardiovascular diseases

V. Badtieva

The Russian Scientific Centre for Restorative and Resort Medicine, Moscow, Russia

Introduction. Objective the researches was to develop and to prove scientifically new programs of not medicamentous treatment and secondary preventive maintenance of patients with an arterial hypertension and ischemic heart disease combination, revealing prevailing influence mechanisms of physioalneofactors and definitions of the differentiated indications to their use. **Materials and methods.** The studied contingent consisted of 127 patients with combination of arterial hypertension II-III degree and ischemic heart disease, angina pectoris II-III class. Patients have been divided into 3 groups: I group received laser therapy, physical exercises, massage, gas carbonic baths; II group patients in addition received the general baths with Iodine and bromine; III groups – in addition contrast baths. Active action of I rehabilitation complex which was reduced

pressure and angina, normalization of a daily arterial pressure profile, quantity and duration reduction of a myocardium ischemia episodes, did heart work economical, increase myocardial and coronary reserves, normalization of diastolic heart functions. **Results.** Addition of a contrast baths course had an extra training effect on an organism, promoted more reduced pressure and angina, reduction of arterial pressure variability, coronary growth, myocardial and aerobic reserves with economy of its works, summarizing action of I complex factors on patients with a combination of arterial hypertension II-III degree and ischemic heart disease, angina pectoris II class. **Conclusion.** Thereby, considering expanding vessels and reduced pressure and angina laser therapy, training action through various mechanisms of medical gymnastics, gas carbonic, the general baths with Iodine and bromine and the contrast baths applied in sparing medical modes, the offered complexes probably could be included in programs of treatment and secondary preventive maintenance of patients with the arterial hypertension and ischemic heart disease combination, concerning to high and very high risk group of cardiovascular complications development.

References

Kniazeva T.A., Badtieva V.A. – Physioalneootherapy of the cardio-vascular diseases, - Practical guidance, - Moscow, - 2008.

Theory of intensity in care-rehabilitation

G. Graziani, A. Marchese, M.L. Nicodemo, M. Celestini

U.O.C. di Riabilitazione Ospedale S. Spirito, Roma

Introduction. In the hypothesis of a new organization of the rehabilitation's circuit, elimination of the structure's codes and identification of a logistics area of intensive care in a single work assessment has been suggested. These, leaving current classification: MDC1 (neurological post-acute) and MDC8 (orthopaedic post-acute). Physiatrists are able to measure cognitive and physical abilities and plan an intervention strategy which generally focuses on improving capacity or residual capabilities so that patients can carry out activities of daily living. Environment and personal factors can greatly influence expression of these skills in everyday life. Thus emphasizes the need for a single classification and an assessment instruments related to it, in every areas (primal and social). That would provide the basis for an assessment and an interdisciplinary study. These tools make this research comparable and useful as a reference model to describe health components (Body Functions and Structures, Activities and Participation) and some of its related components (social and personal factors) through a unified and standard language. Therefore it is necessary to set a new organizational structure through a case-mix, with the introduction of criteria of admission, for an integrated assessment of the following criteria: Clinical; Medical Care; Rehabilitation; Social factors. In relation to: Pre-morbid physical-statement; Severity of the disease (media/severe disability); High or low nursing/physiotherapy care; Role of family; Motivation and willing of patient. However, some of the co-morbidities represent the true disease from primary care in relation to acute event that led to hospitalization in rehabilitation post-acute. The amount of diseases involve: Delay recovering; Higher aid-care; A longer hospitalization; More complexity in the management. **Materials and methods.** Actually there is no model that supports these levels of assistance, based on diagnostic codes related to the cost-effectiveness-efficacy. This model is currently under study from scientific societies by the National SIMFER and ASP. Statistically we assessed a "weight" of the complexity's care through a CORRECTION's FACTOR that has the objective to reduce Barthel Index during check-in procedure, through a mathematical formula balancing the intensity care through the discharge's data indicated by single region (RAD-R in the Region of Lazio). We have combined: Age; Number of co-morbidities; Number of clinical compromises; Barthel Index; Urinary and faecal incontinence; Transfers; Use WC; Number and level of sore. **Results in progress conclusion.** In order of this we have to propose a new organization and structure of the department, based on logistics, staff, technology, assessment tools with a interdisciplinary team that knows how to integrate local environmental and social sector. Finally this new assessment will imply a new modulation of remuneration with specific DRG- F.

References

Shash S, Vanclay F, Cooper B. Improving The Sensitivity Of The Barthel Index For Stroke Rehabilitation. J Clin Epidemiol 1989;42:703-709.
 Mahoney Fi, Barthel Dw. Functional Evaluation: The Barthel Index. Maryland State Med J 1965;14:61-5.
 Decreto Del Presidente In Qualita' Di Commissario Ad Acta 30 Gennaio 2009, N. 10.

Modern rehabilitation programs in physiotherapy of lymphedema of lower extremities

T. Apkhanova, V. Badtieva

The Russian Scientific Centre for Restorative and Resort Medicine, Moscow, Russia

Introduction. A choice method in treatment Lymphedema of the lower extremities I-III stages is conservative therapy which includes medicamentous and not medicamentous methods including the recommendations about change of the life's way, compression by a low-stretch elastic stocking and complex physiotherapy. **Materials and methods.** Action of various physical factors is directed on stimulation of the lymphatic drainage both restriction lymph formation and normalization of processes of micro vascular circulation closely connected with it. We developed and used in rehabilitation programs the technique of magnetic stimulation, magnetic laser therapy, pulse matrix laser therapy, criotherapy, pneumocompressions, balneotherapy (mineral baths and black mud), thalassotherapy (algotherapy with cold seaweed application). Also it's applied Manual Lymph Drainage and bandaging of the affected limb follows each MLD session. **Results.** At I stage - the elastic compression, preventive and medical rehabilitation programs (magnetic stimulation, pneumo compression, magnetic laser therapy, pulse matrix laser therapy, balneotherapy, thalassotherapy). At II stage - recommendations about change of a way of life, compression therapy, medical rehabilitation programs (pneumocompression, magnetic laser therapy, pulse matrix laser therapy, magnetic stimulation, criotherapy, balneotherapy, thalassotherapy, Manual Lymph Drainage and bandaging of the limb). At III stage - change of a way of life, compression therapy, medical rehabilitation programs (pneumocompression, magnetic laser therapy, magnetic stimulation, pulse laser therapy, criotherapy, balneotherapy, Manual Lymph Drainage and bandaging of the limb) are spent 2-3 times a year. At IV stage - patients accept surgical treatment with carrying out of conservative preoperative preparation and postoperative rehabilitation. **Conclusion.** Creation of rehabilitation programs of regenerative treatment of patients with Lymphedema has allowed to raise considerably efficiency of conservative treatment of patients with Lymphedema and to create necessary base for development in Russia a physiotherapeutic direction.

References

Kniazeva T.A., Badtieva V.A. - Physiotherapy of the cardio-vascular diseases, - Practical guidance, - Moscow, - 2008.

Curved walking in stroke patients

A. Nardone^{1,2}, M. Godi¹, G. Margherita¹, M. Schieppati^{3,4}

¹*Posture & Movement Laboratory, Division of Physical and Rehabilitation Medicine, Fondazione Salvatore Maugeri (IRCCS), Veruno (NO)*

²*Department of Clinical and Experimental Medicine, University of Eastern Piedmont, Novara*

³*Centro Studi Attività Motorie, Fondazione Salvatore Maugeri (IRCCS), Pavia*

⁴*Department of Experimental Medicine, University of Pavia, Italy*

Introduction. Curved walking requires complex adaptations, including shift of body weight to counteract the ensuing centrifugal force and production of strides of different length between legs (1,2). We hypothesized that gait would be more stressed in hemiparetic patients (HP) than in normal subjects (NS) when walking along curved with respect to straight trajectories. **Materials and methods.** Twenty HP and 20 NS walked along straight or curved trajectories at self-paced cadence and velocity. Mean step frequency and gait velocity were computed from video-recordings. Centre of pressure during quiet standing (CoP) was recorded. An electronic walkway detected the asymmetry of single support and the degree of foot yaw angle at mid-stance. **Results.** CoP was mostly shifted toward the unaffected limb. Step frequency and velocity were smaller in HP than NS during both straight and curved gait. Velocity ratio between curved and linear gait was smaller in HP than NS. Velocity during both curved and linear walking in HP was independent of affected body side or direction of rotation, but inversely correlated to paretic limb weakness, asymmetry of single support, lateral shift of CoP during quiet stance. External rotation of paretic foot relatively favoured curved walking toward the paretic side. **Conclusion.** Curved locomotion is defective in HP, but impairment is not dependent on direction of rotation across patients, indicating a shared task between legs, or occurrence of effective functional adaptation, or both. Nevertheless, the velocity of curved walking is modulated by asymmetry of body weight and orientation of the paretic foot (3). These findings advocate rehabilitation exercises aimed at targeting

curved walking, restoring the appropriate symmetry of body weight distribution and foot orientation in the horizontal plane.

References

1. Courtine G, Schieppati M. Eur J Neurosci 2003; 18: 177-190.
2. Courtine G, Schieppati M. J Neurophysiol 2004; 91: 1524-1535.
3. Nardone A et al. Gait Posture 2009; 30: 5-10.

Osteoporosis in pregnancy

Gulseren Akyuz

Marmara University School of Medicine, Dept of P.M.&R, Istanbul, Turkey

Osteoporosis is a systemic skeletal disorder characterized by low bone mass and microarchitectural deterioration of bone tissue. While osteoporosis is seen very often, osteoporosis in pregnancy is a rare clinical problem with unknown etiology and pathophysiology. The condition of idiopathic osteoporosis related to pregnancy was first described as a clinical syndrome in 1955 by Nordin and Roper. Whether pregnancy is accidental or is a direct etiologic cause for osteoporosis are questions that remain unanswered. The normal pregnancy induced changes in bone and mineral metabolism allows adequate delivery of calcium to the fetus, mostly in the last trimester of pregnancy. The calcium demand during pregnancy and lactation can be addressed by compensatory mechanisms including increased intestinal absorption of calcium driven by 1,25 dihydroxyvitamin D, decreased urinary excretion of calcium and mobilization of calcium from the maternal skeleton. Parathormone related peptide (PTHrP) release from the lactating breast into the maternal circulation might be responsible from the rapid bone resorption during lactation. Other causes might be milk production, lactation associated amenorrhea and calcitonin deficiency. Therefore pregnancy and lactation may have significant impact on bone density loss and this may result in pregnancy induced osteoporosis and related fractures. The symptoms occur mostly during the first pregnancy and usually does not recur. Changes during pregnancy when superimposed on a decreased bone mass, may lead to pain. Affected women usually present with back pain which appears in last trimester of pregnancy or immediately postpartum, loss of height and fractures. Pregnancy associated osteoporosis is characterized by the vertebral fractures and more rarely fractures of the hip, pubic rami and ribs. The higher prevalence of fractures in the mothers of patients support the possibility of an underlying genetic component. Studies have shown that only a minority of these women have risk factors for osteoporosis and they suggest that bone turnover increased activity and bone mineral density return to normal by six months after weaning. It appears to be clinically distinct from transient osteoporosis of the hip occurring during pregnancy, which is characterized by early presentation, periarticular hip pain and restricted hip motion. Also secondary causes of osteoporosis, that may cause back pain and fractures during pregnancy, should be taken into consideration. At the moment no guidelines exist the therapy of pregnancy associated osteoporosis, this means each case must be analyzed on an individual basis in order to decide the treatment plan.

Rasch analysis of the Stress-Energy Questionnaire

Å. Lundgren-Nilsson¹, A. Pousette², A. Ekman², P. Larsman³

¹*Departement of Clinical Neuroscience and Rehabilitation, Rehabilitation medicine Group, Institute of Neuroscience and Physiology at Sahlgrenska Academy, University of Gothenburg*

²*University of Gothenburg, Occupational and Environmental Health*

³*Department of Psychology, University of Gothenburg.*

Introduction. Stress and fatigue are increasingly recognized as important facets of health in the workplace and elsewhere. Routine monitoring of levels of stress and energy may be facilitated by the Stress and Energy Questionnaire (SEQ). **Materials and methods.** Data was collected from 434 persons in a representative sample from the population in west Sweden. The age range was 18-64 years and 47.2 % were male. Over a third (34.3%) reported depressive feelings, based on a single question. Data from the two subscales of the SEQ were fitted to the Rasch model. A detailed analysis of scoring function and fit to the model was assessed. Analysis of Differential Item Functioning (DIF) was undertaken for gender and depressive feelings. **Results.** The existing six category scoring system for both scales was found to be valid and the distribution of item matched the distribution of persons. No item or person showed misfit to model expectations. DIF was found for gender on the stress scale item 'pressured', and for both gender and depressed feelings on the

item 'passive' in the energy scale. Otherwise both the energy scale and the stress scale showed acceptable psychometric properties. **Conclusion.** The SEQ was found to be unidimensional, valid and reliable, and satisfied the rigorous standards of the Rasch measurement model. Further work is required to determine if the scales work the same way in different groups (e.g. diagnoses).

Psychometric properties of the Shirom–Melamed Burnout Questionnaire (SMBQ)

Å. Lundgren Nilsson¹, I.H. Jonsdottir², G. Ahlberg Jr³, J. Pallant⁴, A. Tennant⁵

¹*Institute of Neuroscience and Physiology, Department of Clinical Neuroscience and Rehabilitation, University of Gothenburg, Sweden*

²*The Institute of Stress Medicine, Carl Skottsbergsgata 22B, 413 19 Göteborg, Sweden*

³*Occupational and Environmental Medicine at the Department of Public Health and Community Medicine, Sahlgrenska Academy at the University of Gothenburg, Gothenburg, Sweden*

⁴*School of Rural Health, University of Melbourne, Australia.*

⁵*Department of Rehabilitation Medicine, Faculty of Medicine and Health, The University of Leeds, UK,*

Introduction. Suboptimal on-the-job performance and sickness absence due to mental health problems are becoming a major concern in many countries. Long-term sickness absence due to mental disorders has increased from the mid-1990s onwards in Sweden, and the foremost cause is believed to be psychosocial stress, especially at work. Ascertaining the risk of, for example, burnout, thus becomes an integral part of monitoring the workforce. **Materials and methods.** Data collected from 319 persons all diagnosed with stress-related Exhaustion Disorder (ED), using the diagnostic criteria as proposed by the Swedish National Board of Health and Welfare (National Board of Health and Welfare 2003), was used for examining the properties of the Shirom–Melamed Burnout Questionnaire (SMBQ). There were 219 women and 100 men with a mean age of 42 years. Initially the structure of the scale was examined with a Principal Component Analysis (PCA). After this a Mokken analysis was conducted to determine if a non-parametric probabilistic Guttman-style relationship existed in the data. Based on these results data from the SMBQ was fitted to the Rasch model. A detailed analysis of scoring function, fit to the model was assessed. Analysis of Differential Item Functioning (DIF) was undertaken for gender and age. **Results.** The PCA gave three factors of the scale and can be described as a combination of the burnout and listlessness domains; a tension domain, and a cognitive weariness domain. The Mokken scale analysis also revealed tension as a separate scale and all but one of the remaining items contributed to a second scale. After adjustments for disordered thresholds and local dependence, the subscales were found to fit the Rasch model. No DIF was found. **Conclusion.** The SMBQ subscales and the total SMBQ are valid for use with ED patients after adjustments. A conversion table can be created for clinicians and researchers to convert ordinal data to interval level. Further work is required to explore the use of the scale to detect early ED in the population.

Past and present issues in Rasch analysis: the Functional Independence Measure (FIM™) revisited

A. Tennant¹, Å. Lundgren Nilsson²

¹*Department of Rehabilitation Medicine, Faculty of Medicine and Health, The University of Leeds, UK,*

²*Institute of Neuroscience and Physiology, Department of Clinical Neuroscience and Rehabilitation, University of Gothenburg, Sweden*

Introduction. Since 1994 over 60 Rasch/FIM papers have been published representing a wide variety of analytical practice. **Materials and methods.** An example of current analytical practice is given with data from the FIM™ Motor scale, based upon secondary analysis of 340 in-patients undergoing rehabilitation following stroke (Tennant A, et al, 2004). A number of key choices can be made about the analytical strategy, for example, using the rating scale or partial credit parameterizations; rescoring disordered thresholds or not. **Results.** Where items were not rescored, the fit of the partial credit parameterization was better than the Rating Scale version. When disordered thresholds were re-scored, fit improved, and considerably so with rescored items using the Partial Credit version where the number of misfit items has fallen to 5. However, considerable local dependency existed in the data, associated with the four underlying domains of 'self care' (6 items); 'sphincter control' (2 items); 'mobility' (3 items) and 'Locomotion' (2 items). The domains

were made into four testlets, and the analysis repeated. This achieved adequate summary fit with no misfit. With strict unidimensionality this provides an optimal solution for the FIM™ Motor scale, retaining all items. **Conclusion.** The current solution retains the clinical utility of the scale (clinimetric) for rehabilitation management while at the same time satisfying modern psychometric measurement standards. It also suggests that the majority of misfit previously reported for the FIM™ Motor Scale may have been attributable to the effects of local dependency as well as, or in combination with the choice of an inappropriate parameterisation of the polytomous model.

References

Tennant A, Penta M, Tesio L et al. Assessing and adjusting for cross cultural validity of impairment and activity limitation scales through Differential Item Functioning within the framework of the Rasch model : the Pro-ESOR project. *Medical Care* 2004; 42: 37-48

The European Project SMILING: Self Mobility Improvement in the Elderly by counteracting falls

F. Marcellini¹, M. Bulgheroni², S. Bar-Haim³, I. Melzer⁴, C. Bula⁵, D. Carus⁶, L. Chiari⁷, D. Šimšik⁸, J. Penders⁹, K. Aminian¹⁰, P. Pavlov¹¹

¹*INRCA: Italian National Institute on Ageing, Italy*

²*ABACUS: Ab.Acus Srl, Italy*

³*SOM: Step of Mind, Israel*

⁴*MISHAN: Mishan, Israel*

⁵*CHUV: Centre Hospitalier Universitaire Vaudois, Switzerland*

⁶*BDM-USTRATH: Strathclyde University, United Kingdom*

⁷*UNIBO: Alma Mater Studiorum, University of Bologna, Dept. of Electronics, Computer Sciences and Systems*

⁸*TUKE: Technical University of Košice, Slovakia*

⁹*IMEC-NL: STICHTING IMEC-NL, The Netherlands*

¹⁰*EPFL: Ecole Polytechnique Fédérale de Lausanne, Switzerland*

¹¹*GCKOSICE: Geriatric Centre of St. Lucas in Kosice, Slovakia*

Introduction. The European project SMILING (FP7, ICT, GA 215493, EC funded 2.250.000) started on 1st January 2008. Eleven research centers, universities and companies of 5 European countries (IT, CH, UK, NL, SK,) and Israel are involved in it. The SMILING project aims to counteract falls in old age. On the basis of the chaos theory, SMILING will develop a wearable computer-controlled device. **Materials and methods.** Prototypes of the system were built to be validated in 4 European countries (IT, NL, CH, SK). The study design, a randomized controlled cross-over trial, is carried on about 96 elderly: the subjects, divided into two groups, will perform 8 weeks of training, 4 with SMILING system in activity and 4 with SMILING system not working, as control. The progress is evaluated 3 times, through questionnaires on physical-psychological functioning, acceptance of technology and gait analysis parameters. **Results.** Currently, the validation is running. The results are about the recruited subjects in Israel (27) and Italy (27). Those subjects matched these criteria: age \geq 65 years, ability to walk at least 20 meters independently, one or more falls in the previous year, no visual and hearing impairments, Tinetti's POMA score between 22-26, positive evaluation at Codex examination, 4-items Geriatric Depression Scale score = 0. The baseline results of the Israeli and Italian elderly are on the following tests: POMA, Narrow-base walking test, Short Physical Performance Battery, Home safety check-list, SF-12, Falls Efficacy Scale International, 6-Minute Walking Test. **Conclusion.** The SMILING validation is running. It is expected to validate the system from the technological and clinical side.

References

For information on the SMILING project and references: www.smiling-project.eu.

Acknowledgement. The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n°215493.

Accelerometry-based activity spectrum in persons with chronic physical conditions

J.B.J. Bussmann, H.J.G. van den Berg–Emons, H.J. Stam

Dept. of Rehabilitation Medicine and Physical Therapy, Erasmus MC University Medical Center Rotterdam

Introduction. Life expectancy has increased in persons with chronic physical conditions. As a consequence, health problems related to an inactive lifestyle are of increasing concern in this segment of the population. The aims of this study were 1) to give an overview of the impact of a variety of chronic physical conditions on accelerometry-based levels of physical activity and to identify

high-risk conditions; and 2) to compare these objectively assessed activity levels with the levels estimated by rehabilitation physicians. **Materials and methods.** We summarized data on the level of everyday physical activity, as objectively measured with an accelerometer-based activity monitor, in 18 chronic physical (sub) conditions, comprising 461 people. Thirty-one rehabilitation physicians filled in a questionnaire designed to obtain their estimates of the level of physical activity in patients with the various conditions. **Results.** Only 3 of the studied conditions had normal activity levels (>90% of the able-bodied level). Persons with transtibial amputation (vascular), spinal cord injury, and myelomeningocele (wheelchair-dependent) had the lowest levels of activity, <40% of the able-bodied level. In general, rehabilitation physicians were aware of the inactive lifestyles, but considerably underestimated the magnitude of inactivity in the high-risk conditions. **Conclusion.** This is the first study to provide an objectively assessed activity spectrum in a variety of chronic physical conditions. Although the optimal level of physical activity may differ between able-bodied persons and persons with a chronic physical condition, we hope that this study will contribute to the awareness of health professionals on which chronic physical conditions are at increased risk for an inactive lifestyle and to adaptation of patient management accordingly

Decompressive craniectomy and evaluation of outcome from regional database GRACER

N. Basaglia¹, G. Zani², L. Roma¹, F. Servadei³, S. Ferro⁴

¹Rehabilitative Medicine Unit, Department of Neurosciences/Rehabilitation, Sector of Rehabilitative Medicine "San Giorgio", Ferrara

²High Speciality Unit for Rehabilitation of Severe Brain Injuries, Department of Neurosciences/Rehabilitation, Sector of Rehabilitative Medicine "San Giorgio", Ferrara

³Neurosurgery Hub & Spoke, Maggiore Hospital, Parma, Santa Maria Nuova Hospital, Reggio Emilia

⁴Hospital facilities Service - General management for healthcare and social policies, Emilia Romagna region

Introduction. The effects in the long term of decompressive craniectomy in the treatment of severe head injury remain unclear. Therefore, the objectives of this multicentric retrospective study are to assess the effect on outcome of decompressive craniectomy and to dimension the regional epidemiological data. **Materials and methods.** Patients having decompressive craniectomy, to 2005 at 2008 years, were included. The informations regarded demographic, clinical, neuroradiological, surgical management, mortality and outcome variables. The 398 patients (mean age 53,80 years) included in the study have been selected from surgical registers, medical records and neuroradiological images. The outcome was evaluated by structured phone interviews and Regional Database GRACER. It allows to establish the current state of the patient and to consequently assign a Glasgow Outcome Scale (GOS) category. **Results.** The dominant aetiologies were severe traumatic brain injury (53%) and stroke (32%). The size of the decompression was however considered too small in 58% of cases. Before surgical decompression in 83,3% of the cases the Glasgow Coma Scale (GCS) was ≤ 8 . The discharge destination was mostly at another acute unit (18,8%) and at home (14,1%). The main outcome measure (GOS) was an unfavourable: 55,6% death (38,3% before discharge; 17,3% after discharge); 6,9% Vegetative State; 16,3% Severe Disability; 10,4% Moderate Disability and 10,7% Good Recovery. **Conclusion.** The results provide a picture of neurosurgical surgical approaches to the management of brain injured patients: mostly patients dies or remains in a poor neurological condition.

References

- Hutchinson P.J. et al.: Decompressive craniectomy in traumatic brain injury – time for randomized trials?. *Acta Neurochir (Wien)* (2005) 147:1-3.
 Boldrini P., Basaglia N.: GRACER: un progetto di rete integrata regionale di strutture, presidi e servizi riabilitativi per le persone affette da Gravi Cerebrolesioni Acquisite. *Giornale Italiano di Medicina Riabilitativa* (2002)16: 61-77

Pressure ulcers in spinal-cord injured patients. A Retrospective Study of the Effect of Lifestyle on the Development of Pressure Ulcers

N. De Baets, T. Defloor, E. De Ruyck, G. Vanderstraeten, A. Viaene
 University Hospital, dep of Physical and Rehabilitation Medicine

Introduction and objective. Spinal-cord injured patients run an extremely high lifelong risk of developing pressure ulcers. Various factors are implicated in this risk. In the present study it was determi-

ned whether changes in a patient's lifestyle contributed to the sudden onset of a pressure ulcer after a many years' ulcer-free interval. **Materials and methods.** A retrospective descriptive study was performed, based on the medical records of 17 spinal-cord injured patients. **Results.** Some of the patients experienced a number of recurrent problems. In three patients a decline in general health preceded the development of a pressure ulcer ; in two others the ulcer occurred during a hospital admission. In five cases isolated incidents were responsible for the development of a pressure ulcer. In another two cases, the patients failed to undertake immediate action at pressure ulcer onset. **Recommendations and conclusion.** In the patient records more attention should be paid to the most important variables that may contribute to the development of a pressure ulcer. Preventive measures, such as the use of specific wheelchair seat cushions or pressure-relieving mattresses, are essential in this respect. Concrete information about drug use, spasticity, contractures, lifestyle, etc. should complete the assessment. For a full appreciation of an individual patient's situation, it is important that his/her history be included in the medical record. In this way, all members of the multi-disciplinary team are well-informed of the patient's habits and health, and more particularly of the progression of the pressure ulcer.

Total hip arthroplasty in young patients. Rehabilitation.

S. Pantelic, O. Nikolic, Z. Bascarevic

Institut za ortopedske i birurske bolesti (IOHB) "Banjica"

Introduction. Total hip arthroplasty are in successful use for many years and we can say it become one of most popular orthopedic procedure. These kinds of operation are usually connected with elderly people. However the development of surgical technique and new materials make the possibility for use it in young population even in adolescent period. The indications for THA are disabling pain or ankylosis with malposition. **Purpose.** Purpose of this report is to underline the problems and doubts connected with THA in young patient as well as specificity of their rehabilitation. There are increasing needs for THA in this age group. **Case report.** Female patient 21 years old with severe hip pain, limitation in ROM and swaying. In eleven she got acute lymphoblastic leukemia treated with cytostatic and corticosteroids. She stopped with therapy 3 years ago and disease is in remission. Roentgenogram shows bilateral avascular necrosis of the hips. There is no hematology contraindication for operation. THA (noncemented) was done on both sides with minimal invasive surgery, first on less damaged then on the other hip. Rehabilitation protocol started first postoperative day, with therapeutically exercises and gait training with assistive devices. Three weeks after second operation she was dismissed from hospital. Patient was able for painless walk with two crutches, half weight-bearing on both legs and significant improvement in ROM. She was advised to continue rehabilitation in rehabilitation centre until she gets full functional recovery. **Conclusion.** Modern new material and advantage surgical technique open new possibilities for THA in young patients having in mind better quality of life and functional abilities.

References

- Roach J.W.; and Paradies L.H.: Total hip arthroplasty performed during adolescence. *J. Pediat. Orthop.* 1984; 4: 418-421
 Maric Z.; and Haynes, R.J.: Total hip arthroplasty in juvenile rheumatoid arthritis. *Clin. Orthop.* 1993; 290: 197-199.
 Chandler H.P.; Reineck F.T.; Wixson R.L. and McCarthy J.C.: Total hip replacement in patients younger than thirty years old. A five-year follow-up study. *J. Bone and Joint Surg.*, 63-A: 1426-1434. Dec. 1981.
 Callaghan J.J.: Results of primary total hip arthroplasty in young patients. *J. Bone and Joint Surg. Nov.* 1993; 75-A: 1728-1734.
 Bisla R.S.; Inglis A.E.; and Ranawat C.S.: Joint replacement surgery in patients under thirty. *J. Bone and Joint Surg. Dec.* 1976; 58-A: 1098-1104.
 Torchia M.E.; Klassen R.A.; and Bianco A.J.: Total hip arthroplasty with cement in patients less than twenty years old. Long-term results. *J. Bone and Joint Surg. July* 1996; 78-A; 995-1003.

The Italian ABILHAND questionnaire can measure manual ability across a variety of motor impairments

A. Simone¹, L. Tesio², V. Rota², L. Perucca²

¹Istituto Auxologico Italiano, Ospedale San Luca, IRCCS, Clinical Unit and Research Laboratory of Neuromotor Rehabilitation, and the
²Università degli Studi di Milano, Department of Human Physiology and Chair of Physical and Rehabilitation Medicine, Milan, Italy

Introduction. The capacity of the Italian version of the ABILHAND questionnaire (AH23-I) to work as an impairment-inde-

pendent measure of manual ability was tested through Rasch Analysis (RA). Originally, this was a 46-item 4-level scale, developed for patients with Rheumatoid Arthritis. Thereafter, a 23-item, 3-level version retaining bimanual or alternate-unimanual items was validated in a sample of 74 Belgian and 29 Italian chronic stroke patients, and maintained the same item hierarchy across these two distinct impairments and countries. Later research was devoted to the development of impairment-specific versions, with diverse item sets and levels. **Materials and methods.** In this study, the generalizability of the original 23-item scale to a common rehabilitation case-mix was tested by applying the scale to a sample of 150 Italian subjects: 24 healthy controls, and 126 out- or in-patients. Of these, 83 presented with chronic hemiparesis, 10 with tetraparesis, 33 with a mix of other neural impairments (multiple sclerosis, ataxia, Parkinson's disease). AH23-I scores were routinely recorded from the whole sample over period of 6 months. One or more variables out of: sensation (64-Hz tuning fork- index fingertip), force (Jamar handgrip) or dexterity (Box & Block test or Purdue pegboard assembly) were assessed in sub-samples of patients, as per clinical routines. The study goal was unknown to the 4 prescribing physicians and the 2 occupational therapists who administered and rated the tests. RA (rating scale model) was performed through Winsteps™ software. **Results.** Item difficulty in the AH23-I ranged over 5 logits, which were 0-100 transformed. Item Rasch reliability index (ideal=1) was 0.94. Item internal consistency across items (ideal: 0.7-1.4) was good (infit mean-square index ranging from 0.67 to 1.51). Average subjects' ability was 89 (SE 8) and 63 (SE 17) in controls and patients, respectively. The AH23-I ability measure was significantly correlated with measures from other sensory and motor tests (average across hands; Pearson's r ranging from 0.37 to 0.53, p<0.01). The item hierarchy was substantially retained across gender, impairment (hemiparesis vs. other), age and ability subgroups (above/below median). The same held when the hierarchy of item difficulty was contrasted across the present mixed sample and the original Belgian-Italian stroke sample. **Conclusion.** Results suggest that ABILHAND can be applied in its original 23-item form to a variety of impairments commonly encountered in Italian rehabilitation units.

References

Tesio L. Special report. Measuring person's behaviors and perceptions: Rasch analysis as a tool for rehabilitation research. *J. Rehabil Med* 2003;35:1-11.
 Penta M, Tesio L, Arnold C, Zancan A, Thonnard JL. The ABILHAND Questionnaire as a Measure of Manual Ability in Chronic Stroke Patients. *Stroke* 2001;32:1627-1634.
 Burger H, Franchignoni F, Kotnik S, Giordano A. A Rasch-based validation of a short version of ABILHAND as a measure of manual ability in adults with unilateral upper limb amputation. *Disabil and Rehabil* 2009;31:2023-2030.

The synergies of instrumental assessment, botulinum toxin (BT) and rehabilitation in the Multiple Sclerosis' spasticity

G. Ianieri, R. Marvulli, M. Ranieri, G. Tondi, S. Altini, L. Mastromauro, E. Romanelli, M. Megna, G. Megna

Neurological and Psychiatric Sciences Department, Physical Medicine and Rehabilitation University of Bari, Italy

Introduction. Purpose of this study was to compare two methods assessing the effect of BT on spasticity: the Modified Ashworth Scale method (MAS) and the myometric method. **Materials and methods.** Two groups of 10 patients were treated with BT and FKT (5 and 3 days a week for each group). Was evaluated the degree of spasticity using MAS; using the myometric method, were evaluated muscle tone, elasticity and stiffness. The evaluations were performed before the administration of BT (to) and after 25, 90 and 105 days (t3). **Results.** Myometric method demonstrated that the effect of the drug lasted about three and a half months for both groups (first group: from 18.6 to 18.01; second group from 17.20 to 16.73, P <0.001). For the second group, the myometric method demonstrated that the effect of the toxin was also present after 25 days (myometric method: from 17.20 to 15.36; MAS: from 2.13 to 2.10, p<0.001). Finally, when using the myometric method it was possible to assess the improvement of the data of elasticity and stiffness. **Conclusion.** Myometric method is more accurate than the MAS. Moreover, by considering the changes in elasticity and muscle stiffness, we have a broader view of spastic muscle, and we can better plan appropriate rehabilitative care for each patient.

References

1. Vain A. Role of skeletal muscle tone and elasticity in the workability restoration of male cross-country skiers. *Acta Acaedemiae Olympique Estoniae*. 10(1):95-108, 2002.

2. Ööpik V., Timpmann S., Karelson K., Vain A. Monitoring of the training of triathletes – a longitudinal case study. *Acta Academiae Olympique Estoniae*, 11(1):70-84, 2003.
 3. Bizzini M., Mannion A.F. Reliability of a new, hand-held device for assessing skeletal muscle stiffness. *Clin. Biomech.* (Bristol, Avon), 18(5):459-461, 2003.

Effectiveness of combined treatment of botulinum toxin, biofeedback, electrical stimulation and physiotherapy in chronic pelvic floor

G. Ianieri, M. Ranieri, R. Marvulli, G. Tondi, S. Miccoli, L. Mastromauro, E. Romanelli, M. Megna, G. Megna

Neurological and Psychiatric Sciences Department, Physical Medicine and Rehabilitation University of Bari, Italy

Introduction. Purpose of this study is to determine the effectiveness of botulinum toxin therapy, combined with pelvic floor rehabilitation techniques, for the treatment of pelvic floor dissinergia's. **Materials and methods.** Between January 2005 and August 2009, 15 patients (4 women and 11 men) with a mean age of 54 years (between 31 and 68) after manovolumetria anus rectal exams were subjected to EMG-guided inoculation of TB in the four quadrants of the external anal sphincter. After infiltration, patients were subjected to two sessions a week of biofeedback, electrical stimulation and physiotherapy for a total of 8 sessions. **Results.** After 4 weeks, patients underwent clinical and anorectal manovolumetria exams. All patients were free of symptoms without any side effects. A questionnaire (0 = not at all 10 = very satisfied) assessed overall patient satisfaction (averaged 9.26, p <0.001). It also demonstrated a significant reduction in tone to manovolumetria anorectal at rest (from 54.26 to 24.6, p <0.001) and decrease (from 146.86 to 115.4, p <0.001). **Conclusion.** Combined treatment of TB, biofeedback, electrical stimulation and physiotherapy is very effective and without side effects. Patients can therefore avoid the common therapy drug, such as the local treatment with nitrates, often ineffective and poorly tolerated because they can cause the onset of headaches.

References

1. Katsinelos P, Papaziogas B, Koutelidakis I, et al. Topical 0.5% nifedipine vs. lateral internal sphincterotomy for the treatment of chronic anal fissure: Long-term follow-up. *Int J Colorectal Dis* 2006;21:179-83.
 2. Witte ME, Klaase JM. Botulinum toxin A injection in ISDN ointment-resistant chronic anal fissures. *Dig Surg* 2007;24:197-201.
 3. Madalinski M, Chodorowski Z. Relation between botulinum toxin and nitric oxide donors in the treatment of the chronic anal fissure. *Med Sci Monit* 2005;11:HY1-HY5.

Objectives for logopedic management of serious acquired brain injury patients in early post-acute rehabilitation – proposal of a chart for multidisciplinary observation of functionality in the orofacial region

M. Manfredini, A. Stori, R. Tralli, G. Arioli

“Carlo Poma” Hospital, Rehabilitation Department, Specialist Rehabilitation Unit, “Destra Secchia” Hospital Trust, Pieve di Coriano, Mantua

Introduction. It is a widely held opinion that where patients are in a vegetative and/or minimally responsive state, there is a need: to initiate treatment even before the patient shows signs of conscious response; to evaluate cognitive responsiveness with standardized tools, not least through multidisciplinary comparison of responses to stimuli in diversified contexts, observing certain common denominators (controlled environment, qualitative/quantitative progression of stimuli, presence of relatives, choice of material)... Given that a variety of important functions take place in and around the buccal cavity (exploration of surroundings, feeding, breathing, communication...), it is believed that functionality of the orofacial region should be a component of primary importance in the approach to the patient's condition, both in favouring sensory and perceptive stimulation that can be provided by all members of the team, and as a tool for evaluating the evolution of patient responses based on the principle of behaviour repeatability in different contexts. **Materials and methods.** With the end in view of facilitating comparison between operators, a chart is proposed for use by all disciplines involved, on which to gather data relating to the observation of certain fixed parameters while various activities are being performed. The proposed use of an observation chart is applicable to the stage of early interdisciplinary treatment for patients in a vegetative and/or

minimally responsive state, characterized by scores of LCF 2/8 and LCF 3/8 on the Levels of Cognitive Functioning scale. With regard specifically to the protocol, treatment must always be preceded by an assessment of the patient, both overall (clinical-cognitive-behavioural), and specifically logopedic (search for signs indicating difficulty in swallowing and/or risks to breathing, assessment of praxis, of archaic physiological and/or pathological reflexes, of swallowing, of breathing and of posture). In early post-acute rehabilitation, moreover, orofacial stimulation must be conducted in a context of daily patient care activities — personal hygiene, mobilization, changes of posture — seeking both to provide sensory stimuli (visual, gustatory, olfactory, tactile, thermal...) and to facilitate basic movements and/or inhibit pathological reflexes, evoking responses. **Results.** Particular importance should be given to the context in which the protocol is developed: the patient's premorbid experiences / habits and current clinical status must be assessed; particular care must be given both to the external environment, so that stimuli can be presented in an orderly fashion, not prolonged, accompanied by verbal explanation or otherwise, and to the most suitable posture, paying attention especially to the head/neck/torso system; a temporal sequentiality emulating daily routine must be applied (for example, regular times, suitably adjusted lighting...); emphasis should be given operationally to the affective and emotional aspect (involvement of relatives, use of material having particular significance for the patient...). **Conclusion.** Finally, intervention strategies of the protocol must be developed through a system of research for answers, then adaptation of the stimulus and redefinition of the objective, always followed by comparison of answers produced, both at sequential intervals in time, and applying a system of comparison with other members of the team.

References

Borer-Alafi N, Gil M., Szabon L, Korn >C. Loewenstein communication scale for the minimally responsive patient Brain Injury, vol 16 n. 7 593-609 (2002)
 Cancialosi P., Riabilitazione del cerebroleso disfagico Quaderni di Logopedia collana diretta da O. Schindler Torino Minerva Medica, maggio. (2007)
 Chiambretto et al. Patients in a persistent vegetative state: caregiver attitudes and reaction Acta Neurol: Scand: 104 364-368 (2001)
 Daniels et al. Clinical predictors of dysphagia and aspiration risk: outcome measures in acute stroke patients Arch. Phys. Med. Rehabil n. 81 1030-1033 (2000)
 Davies M. Patricia. ,Ricominciare, Milano, Springer (2004)
 Elliott et al., Rehabilitation interventions for vegetative and minimally conscious patients Neuropsychological Rehabilitation vol.15 July 480-493 (2005)
 Farneti et al. The Swallowing Centre: rationale for a multidisciplinary management Acta Otor. Italica ; 27 200; (2007)

Does human gait exhibit comparable and reproducible long-range autocorrelations on level ground and on treadmill?

B. Bollens^{1,2}, F. Crevecoeur^{1,3}, V. Nguyen², C. Detrembleur¹, T. Lejeune^{1,2}

¹Université Catholique de Louvain, Rehabilitation and Physical Medicine Unit, Brussels, Belgium

²Université Catholique de Louvain, Cliniques universitaires Saint-Luc, Physical and Rehabilitation Medicine Department, Brussels, Belgium

³Université Catholique de Louvain, Center for Systems Engineering and Applied Mechanics (CESAME), Louvain School of Engineering, Louvain-la-Neuve, Belgium

Introduction. Stride duration of young healthy subjects fluctuates over the long-term in a very complex way. The presence of long-range autocorrelations among these fluctuations has already been highly suggested for subjects walking on level ground¹, but the mathematical methods used among studies are variable. Moreover, despite the frequent use of a treadmill in rehabilitation, the presence of such autocorrelations was nearly exclusively assessed during level-ground walking. The first aim of this study was to detect the presence of long-range autocorrelations during level-ground walking with a high level of evidence. The second aim was to challenge the persistence and the reproducibility of the results during treadmill walking.

Materials and methods. Stride duration fluctuations of ten young healthy subjects were first assessed on a 37m-long track, using an integrated approach that combines rescaled range analysis and power spectral analysis². Next, the same walking test was performed twice on a treadmill, in order to test the persistence and the reproducibility of the results obtained during treadmill walking. **Results.** The outcomes of this study confirm with a high level of evidence that long-range autocorrelations are present among stride duration variability on level ground. The persistence and the reproducibility of the results

during treadmill walking also validate the use of the treadmill to assess the long-term fluctuations of human gait. **Conclusion.** These conclusions widen the current fields of gait analysis. The assessment of long-range autocorrelations could be combined with other gait parameters traditionally measured on a treadmill in order to improve our understanding of normal and pathological gaits and to enhance our knowledge pertaining to motor control.

References

1. Hausdorff JM. Is walking a random walk? Evidence for long-range correlations in stride interval of human gait. J.Appl.Physiol.1995.
 2. Rangarajan D. Integrated approach to the assessment of long range correlation in time series data. Physical review E 2000.

Botulinum toxin versus Fascial Manipulation technique in the treatment of chronic facial pain associated with temporo-mandibular dysfunction

A. Stecco¹, L. Guarda-Nardini², D. Manfredini², S. Bressan¹, C. Ferraro¹, S. Masiero¹

¹Physical Medicine and Rehabilitation, University of Padova, Italy

²Department of Maxillofacial Surgery, University of Padova, Italy

Introduction: The present investigation is a preliminary randomized clinical trial with the aim to assess the efficacy of type A botulinum toxin and Fascial Manipulation technique to treat myofascial pain symptoms and to reduce muscle hyperactivity in bruxism.

Materials and methods. Thirty patients (22 males, 8 females; age range 23-69 years) with a diagnosis of chronic facial pain associated with myofascial syndrome were randomly divided in 2 groups: 15 subjects (9 women, 6 men, mean age 44) were treated with botulinum toxin injections (group A) and 15 subjects (10 women, 5 men, mean age 49) were treated with four sessions of Fascial Manipulation technique (group B). All the patients were assessed with the Research Diagnostic Criteria for Temporomandibular Disorders axis II (intensity of facial pain, limitation of ADL). **Results.** The group A showed a decrease in pain (from 8.1 to 6.8 of the VAS scale) and in the masticatory pain (from 4.6 to 3.8). Moreover, botulinum toxin injections permit to quit habits of tooth grinding and clenching. There are no side effects further a "fixed" smile for about 6 to 8 weeks. In group B a reduction of pain intensity was evident (from 6 to 2.1). Significant differences were found in rest pain between pre-intervention and both post-intervention and one month follow-up periods. Besides, all the participants reported reductions in headache frequency and intensity over time, although only in the group B this improvement was statistically significant (88.5%). Surface electromyography mesured a decrease of frequency (microvolt) and amplitude of muscle activity in both groups, but higher in group A. **Conclusion.** Results from the present study support the efficacy of BTX-A and Fascial Manipulation technique to reduce myofascial pain symptoms in bruxism, and it is probably that using both the methods could further improved the outcomes. A larger definitive trial will be needed to confirm this hypothesis.

Effects of a rehabilitation treatment including kinesitherapy and hydrokinesitherapy in a spa centre: a randomized controlled trial in patients with postmenopausal osteoporosis

S. Masiero¹, L. Bonaldo¹, A. Stecco¹, S. Bressan¹, C. Ferraro¹, A. Lalli²

¹Rehabilitation Unit, University of Padova, Italy

²Centro Studi "Pietro D'Abano", Abano Terme (PD), Italy.

The study was supported by a grant from Region Veneto (DGR n. 2588 -2004)

Introduction. Recent studies have shown that women with postmenopausal osteoporosis present postural modifications associated with changes in balance, leading to increased risk of falling. The aim of rehabilitation in these patients is to reduce fall risk and prevent fall complications. The objective of this study was to evaluate the impact on posture and balance of an association of kinesitherapy and hydrokinesitherapy in a spa centre, in females with postmenopausal osteoporosis. **Materials and methods.** A group of 65 subjects with postmenopausal osteoporosis (mean age 63.1 years; T-score < -2.5 measured by the DEXA technique), were randomized into 2 groups: an experimental group (EG) with 32 subjects (mean age, 62.9±2.1) and a control group (CG) with 33 subjects (mean age 63.9 ±1.5). The EG underwent rehabilitation treatment including kinesitherapy and hydrokinesitherapy in a spa centre, while the CG received no rehabilitation treatment. At baseline and after 12 months all subjects were

evaluated with a compass-needle pocket goniometer (IncliMed®) for spinal mobility and a force platform balance, with eyes both open and shut. **Results.** At baseline assessment no significant differences were found between the two groups. At final assessment, after treatment, the women in the EG presented a significant improvement in balance compared to those in the CG. In particular, analysis with the force platform balance yielded a statistically significant decrease ($p < 0.050$) in sway path, sway area and A-P sway values with eyes shut, in addition to a non-statistically significant decrease in the same parameters with eyes open. Assessment of the vertebral column showed postural alignment at the level of the thoracic kyphosis, with changes in partial values and an improvement in vertebral column mobility in the sagittal plane. **Conclusion.** This study suggests that our rehabilitation programme can alter postural state, improve spinal mobility, reduce balance instability and consequently decrease the risk of falling.

Post-stroke robotic training of the upper limb: a randomized trial study (preliminary results)

S. Masiero¹, G. Rosati³, S. Valarini¹, P. Poli¹, G. Ferlini², A. Chiasera², M. Armani², A. Rossi³, C. Ferraro¹

¹Department of Rehabilitation Medicine, University of Padua, Italy

²Neuromotor Rehabilitation Unit, Eremo Hospital, Arco (TN), Italy

³Department of Innovation in Mechanics and Management, University of Padua, Italy

The study was supported by a grant (year 2008) from the Autonomous Provinces of Trent (Italy)

Introduction. Robot therapy can be a promise in rehabilitation treatment in post-stroke patients; the aim of our study was to assess a rehabilitation protocol that allows to directly compare the effectiveness of the robot therapy (by NeReBot developed at Padua University) to the traditional rehabilitation treatment. **Materials and methods.** Ten hemiparetic patients after a mean of 14.5 (SD 5.5) after a unilateral, ischemic embolic, or thrombotic stroke (mean age 71.2 (6.1) y.; 7 male and 3 female) were randomized in the experimental group (EG; n=5) and the control group (CG; n=5). Patients of both groups received the same length per day of treatment time (120 minutes) for five days a week and for five weeks. The daily treatment (120 minutes) in the EG included traditional rehabilitation therapy (for a ratio of 65%) and robotic therapy (for a ratio of 35%): robotic sessions will last an average of 20 minutes, twice a day that consisted of peripheral manipulation of the shoulder and elbow of the impaired limb, correlated with visual stimuli. The CG will receive only the traditional rehabilitation treatment. Clinical evaluation was performed at the baseline, after 5 weeks (i.e., at the end of treatment protocol) and 3 months after the beginning of the rehabilitation treatment with: 1) Medical Research Council for deltoid, biceps and triceps, wrist flexors and wrist extension muscles; 2) Fugl-Meyer Assessment for shoulder/elbow and coordination and wrist/hand subsections; 3) Motor-Functional Independent Measure; 4) box and block test; 5) a questionnaire of acceptance NeReBot therapy (1-10; 10 maximum acceptance). **Results.** The 2 groups were comparable in demographic characteristics and no significant differences were found in pre-treatment clinical evaluations. Compared with the patients in the CG, the EG showed not significant difference in motor impairment and functional recovery of the upper limb, as measured in all the clinical assessment at the end of rehabilitation treatment protocol and at 3-months follow. The questionnaire administered to the EG patients at the end of robot therapy showed that this form of intervention was well accepted and tolerated (mean score, 7.5/10) and all patients were in favor of including NeReBot training in rehabilitation program. **Conclusion.** Specific sensorimotor stimulation by NeReBot appears to lead an improvement to motor and functional outcome in the impaired upper limb, similarly to the traditional rehabilitation treatment and the improvement persists at the 3-month follow-up. On the base of our preliminary results, robotic therapy by NeReBot may therefore effectively complement standard rehabilitation in paretic upper limb post-stroke patients.

Twelve-month follow-up of rehabilitation treatment for the management of patients with ankylosing spondylitis in anti-TNF treatment. A randomized controlled trial

S. Masiero¹, L. Bonaldo¹, M. Pigatto¹, R. Ramonda², A. Lo Nigro², L. Punzi¹, C. Ferraro¹

¹Department of Rehabilitation Medicine, University of Padua, Padua, Italy

²Department of Rheumatology, University of Padua, Padua, Italy

Introduction. Management ankylosing spondylitis (AS) requires a combined pharmacological and non-pharmacological therapy. The aim of this study was to assess the long term effects on pain, spine mobility, physical function outcome of the rehabilitation program. **Materials and methods.** Thirty-eight outpatients (8 women and 30 men, mean age 47.5±10.6 years) with clinically stabilized AS, in treatment with a standard dose of TNF drugs for at least 9 months, were consecutively enrolled into the study and randomly recruited to rehabilitation (n=18; Rehabilitation Group, RG) or no rehabilitation treatment (n=20; Control Group, CG). Rehabilitation treatment included 2 educational meetings and 12 exercise sessions (60 min. session, 2 times/week), including exercises for spine/hip joint flexibility, stretching, chest and breathing expansion. The patients were taught the programmed exercises and encouraged to perform them at home at least three times per week. Outcome assessment after rehabilitation treatment and 12-months follow-up included: spinal pain intensity by the Visuo-Analogue Scale, Bath Ankylosing Spondylitis Metrology Index, Bath Ankylosing Spondylitis Functional Index, Bath Ankylosing Spondylitis Disease Activity Index, chest expansion, active range of motion of cervical and lumbar spine measured by a pocket goniometer (IncliMed®). **Results.** The 2 groups were comparable in demographic characteristics and no significant differences were found in clinical evaluations at baseline. Intragroup comparison after the rehabilitation treatment (after 2 months from the start) showed that the RG significantly improved ($p \leq 0.050$) in pain, functional and spine mobility, compared to CG, and the results were maintained to check at 12-month follow-up. **Conclusion.** Our results show that the combination of an intensive group exercise and an educational-behavioural program can provide promising results in the long-term functional and mobility outcomes for the management of patients with clinically stabilized SA in treatment with TNF.

Acetylcholinesterase inhibitor donepezil chlorohydrate effectiveness in critical cognitive impairment and behavioural disorders after serious TBI: a case report.

M. Calegari¹, S. Di Carlo¹, L. Cocchini², A. Eskenazi², C. Macchetta², M. Beatrice², A.L. Fogliato³

¹Medici Specializzandi, Università degli Studi di Torino, Scuola di Specializzazione in Medicina Fisica e Riabilitazione, A.S.O. CTO-Maria Adelaide, S.C. Recupero e Riabilitazione Funzionale

²Medici specialisti in Medicina fisica e Riabilitazione

³Logopedista

Introduction. Cognitive impairment is a common neuropsychiatric sequelae of traumatic brain injury. Cholinesterase inhibitors (AChEIs) are well known to enhance cognitive functioning in patients with Alzheimer's disease. Many recent studies have shown that AChEIs clinical effects can be extended to patients with critical cognitive impairment after TBI (traumatic brain injury). **Materials and methods.** We report of a young male patient with critical cognitive impairment and behavioural disorder after serious TBI which did not ameliorate after prolonged therapy with atypical antipsychotic, beta blockers and SSRI. After seven months since trauma we administered an acetyl-cholinesterase inhibitor (donepezil chlorohydrate) at 5 mg/die for 3 weeks and 10 mg for other 6 weeks with positive outcomes. **Results.** The patient seemed to improve in few days after donepezil administration: he showed a more regular sleep-wake rhythm, he became more active and cooperative, he improved his contact with people and environment. A week later the patient showed behavioural and motor initiatives. Also aggressive and self-harm behaviours decreased. Four weeks later the patient can be finally tested with cognitive, speech, communicative, and neuropsychological tests, previously not administrable because of his totally collaboration lack. **Conclusion.** We intriguingly noticed a prompt improvement few days after the administration of donepezil. In degenerative dementia (e.g. Alzheimer), where the efficacy of the drug is well proven, improvements are much more progressive. Moreover improvements in relational ability produced an enhancement in every rehabilitative component. Donepezil could be an useful therapeutic option in the treatment of cognitive impairment and behavioural disorders after TBI alone or in association with other more frequently used drugs (e.g. carbamazepine, beta-blockers, antidepressants, SSRI). Larger studies are needed to confirm our findings.

References

- Whelan FJ, Walker MS, Schultz SK. "Donepezil in the treatment of cognitive dysfunction associated with traumatic brain injury". *Ann Clin Psychiatry* 2000;12:131-5.
- Masanic CA, Bayley MT, vanReekum R, Simard M. "Open-label study of donepezil in traumatic brain injury." *Arch Phys Med Rehabil* 2001;82:896-901.

- Arciniegas DB. "The cholinergic hypothesis of cognitive impairment caused by traumatic brain injury." *Curr Psychiatry Rep* 2003;5:391-399.
- Zhang L, Plotkin RC, Wang G, et al. "Cholinergic augmentation with donepezil enhances recovery in short-term memory and sustained attention after traumatic brain injury." *Arch Phys Med Rehabil* 2004;85:1050-1055.
- Ballesteros J., Guemes I, Ibarra N., Quemada J. "The effectiveness of Donepezil for cognitive rehabilitation after traumatic brain injury: a systematic review". *J Head Trauma Rehabil* 2008, Vol. 23, No. 3, pp. 171-180.
- Yong Wook Kim, Deog Young Kim et al. "The Changes of Cortical Metabolism Associated With the Clinical Response to Donepezil Therapy in Traumatic Brain Injury" *Clin Neuropharm* 2009;32: 63-68.

Buccality and cognitive impairment in patient affected by Traumatic Brain Injury

S. Vesco¹, A.L. Fogliato², M. Alloro³, M. Cancelli³, C. Macchetta³, M. Beatrici³, A. Cistaro⁴

¹Medico Specializzando, Università degli Studi di Torino, Scuola di Specializzazione in Medicina Fisica e Riabilitazione, Torino

²Logopedista, A.S.O. CTO-Maria Adelaide, S.C. Recupero e Riabilitazione Funzionale-

³Medici specialisti in Medicina Fisica e Riabilitazione, A.S.O. CTO-Maria Adelaide, S.C. Recupero e Riabilitazione Funzionale

⁴Medico Specialista in Medicina Nucleare, Positron Emission Tomography Centre IRMET S.p.A., Turin, Italy

Introduction. Dysphagia is a common sequela of TBI and other brain injuries and can hardly affect recovery. In subacute state after Traumatic Brain Injury (TBI) evaluation of ability in swallowing provides many information about level of consciousness and clinical evolution and outcome. (Schindler A. et al. 2001). **Materials and methods.** *Objective:* The objective of the study is to analyze if there is a correlation between cognitive impairment and disorders in some aspect of buccality and if that is supported by instrumental analysis ((18F) fluorodeoxyglucose positron emission tomography study - FDG PET). *Design:* Single center prospective cohort study with consecutive inclusions. *Setting:* Rehabilitation Unit of a University Hospital. *Patients:* Ten mild and severe TBI patients recovered in the Unit of Neurorehabilitation from 1/03/2008 to 31/12/09 were included in the study. *Interventions:* Patients underwent to clinical evaluation in which were examined by MIDA test, LCF - Levels of Cognitive Functioning Scale, qualitative analysis about non-declarative memory, qualitative analysis of oral sensibility and of swallowing with Bed-side assessment. Then patients were studied with 18F-FDG-PET/CT to quantitatively measure regional cerebral glucose metabolism in some cerebral areas implicated in cognitive functioning and/or in buccality (sensorimotor cortex, premotor cortex, cerebellum, orbito-frontal cortex, prefrontal cortex, cingulate cortex, precuneus, insula, thalamus sensory and motor association cortices). **Results.** The study, still in progress, suggest that could be a correlation between buccal manifestation (alteration in oral sensibility, pathological reflex, altered coordination during swallowing) and cognitive impairment (attention, vigilance, memory), and that seems to be supported by 18F-FDG-PET analysis. **Conclusion.** Such findings may help to explain the variable nature of swallowing disorders after TBI. It may also be the first step to understood correlation between swallowing disorders and cognitive impairment in patient with TBI.

References

- Cancialosi P. Riabilitazione del cerebroleso disfagico. Quaderni di Logopedia, Edizione Minerva Medica, 2007.
- Tai YF, Piccini P. Applications of positron emission tomography in neurology. *J Neurol Neurosurg Psychiatry*. 2004;75(5):669-76.
- Harris ML, Julyan P, Kulkarni B, Gow D, Hobson A, Hastings D, Zweit J, Hamdy S. Mapping metabolic brain activation during human volitional swallowing: a positron emission tomography study using [18F]fluorodeoxyglucose. *J Cereb Blood Flow Metab*. 2005;25(4):520-6.

The effects of inpatient rheumatologic rehabilitation programs on the function and disease activity in chronic rheumatoid arthritis and ankylosing spondylitis: one-year follow-up

F. Figen Ayhan, Rukiye Yazıcı, Muharrem Geçene, Pınar Borman, Z. Rezan Yorgancıoğlu

Ankara Training and Research Hospital, 1st Clinic of PRM, Ankara, Turkey

Introduction. Both rheumatoid arthritis (RA) and ankylosing spondylitis (AS) are chronic inflammatory rheumatic diseases leading

to chronic pain and disability. There are very limited data about the impact of inpatient rehabilitation for patients with RA and AS. The aim of this controlled study was to evaluate the long-term effects of inpatient rehabilitation using composite disease activity measures and widely used functional instruments in patients with RA and AS. **Materials and methods.** Totally 120 eligible patients with RA and AS were included this study after giving informed consent. Patients were excluded having variations in DMARDs therapy at any time during trial and dependence in activities of daily living. Randomized selected patients were equally distributed as rehabilitation and control groups (30 patients in each group). **Results.** Mean age and disease duration of patients with chronic RA were 51.8±11.7 and 8.5±6.4 years, respectively. HAQ scores improvements were better in rehabilitation group than controls. Mean age and disease duration of patients with AS were 39.7 ±10.4 and 8.7 ±7.8 years, respectively. Multivariate comparisons showed that BASFI and BASDAI scores improvements were same in both groups. Inpatient care is reserved for patients who have the most advanced rheumatic diseases with the most functional impairment. Inpatient rheumatologic rehabilitation programs improved physical function and disease activity in patients with RA and AS. However, statistically significant improvement was detected only HAQ scores of RA patients. **Conclusion.** Since patients' functioning is a central aspect of the rheumatic diseases, multidisciplinary rheumatologic rehabilitation programs should be applied to all of these patients ranging from home exercises to inpatient rehabilitation.

References

- Dagfinrud H, Hagen KB, Kvien TK. Physiotherapy interventions for ankylosing spondylitis. *Cochrane database of Systematic Reviews* 2008; Issue 1. Art.No.: CD002822. DOI: 10.1002/14651858.CD002822.pub.3.
- Vliet Vlieland TP, Li LC. Rehabilitation in rheumatoid arthritis and ankylosing spondylitis: differences and similarities. *Clin Exp Rheumatol*. 2009;27(4 Suppl 55):S171-8.

Determinants for muscle recovery in upper and lower motorneuron traumatic lesions useful for selecting paraplegics subjects to stand and walk through FES

A. Cerrel Bazo Humberto¹, H. Kern², U. Carraro³, F. Protasi⁴, M. Winfried⁵, C. Hofer⁶, A. Fiaschi⁷, A. Giustini⁸

¹Unita Spinale di Villanova sull' Arda, ASL di Piacenza, Centro di Neuroriabilitazione e Ricerca di Villa Margherita, Arcugnano, Vicenza, Scuola di Specialità in Medicina Fisica e Riabilitazione, Università di Verona, Italy

²Department of Physical Medicine, Ludwig Boltzmann Institute of Electrostimulation and Physical Rehabilitation, Wilhelminenspital, Vienna, Austria

³Laboratory of Translational Miology, Interdipartimental Center of Miology & Consiglio Nazionale delle Ricerche, Institute of Neuroscience, c/o Department of Biomedical Sciences, Università di Padova, Padova, Italy

⁴Interuniversity Institute of Miology, Centro Scienze dell'Invecchiamento, Università degli Studi G. d'Annunzio, Chieti, Italy

⁵Center of Biomedical Engineering and Physics, Medical University of Vienna, Vienna, Austria

⁶Department of Physical Medicine, Ludwig Boltzmann Institute of Electrostimulation and Physical Rehabilitation, Wilhelminenspital, Vienna, Austria

⁷Dipartimento di Scienze Neurologiche e della Visione. Scuola di Specialità in Medicina Fisica e Riabilitazione. Università di Verona, Italy

⁸Istituto di Riabilitazione Santo Stefano, Ospedale San Pancrazio, Arco di Trento, Italy

Objective. To shed light for the determinants of nerve-muscle failure in generating functional forces in SCI (spinal cord injury) muscles useful for standing or walking through FES. To investigate nerve-muscle integrity & organization, excitatory-contractile (EC) coupling machinery, metabolic activity and FES response in paralysed muscles up to 20 years post-SCI. *Setting:* Neurorehabilitation-Research center & Institute of Myology. **Study design.** Prospective, case-series study design. **Statistical Analysis.** Mann-Whitney U-test to define for statistical significance as well as Student t Test. Student's t Test was mostly used for the analysis of significance when evaluating morphometric characteristics of the muscle fibres. **Participants.** Sixteen paraplegics with upper (1st MTN) and lower (2nd MTN) motorneuron SCI. 1st MTN group: 9 male & one female. mid-term subgroup; elapsing time after SCI: 1-3 years: ASIA level injury mean T7 range T5-T12. long-term; elapsing time after SCI: 14-20 years: ASIA level injury mean T8 range T5-T12. 2nd MTN group: 5 male & one female. short-term subgroup; ela-

psing time after SCI: 8-9 months; ASIA level injury mean T12/L1, range T8-12/L1-L1. mid-term subgroup; elapsing time after SCI: 2,9-3,4 years; ASIA level injury mean T12-L1 range T12-T6/12-L1. long-term; elapsing time after SCI: 6,1-8,7 years; ASIA level injury mean T12/L1 range T9/12-L1 **Intervention.** Muscle biopsies from vastus lateralis muscle, study of fiber composition, electronic micrographs for ultrastructure analysis, CTscan for area and density of thigh measurements, force measurement, 2 years training of FES in denervated muscles. For the elaboration of the present work it was necessary our participation to the european FES project "RISE" for the study of long-term denervated-degenerated muscles. **Main Outcome Measures.** Muscle-mass bulk, muscle fiber size, fiber composition, force generation, ultrastructural findings; mitochondria, triads, M lines, Z Lines, T-Tubes, sarcoplasmic reticulum, muscle response to FES, denervation-anti/NCAM. **Results.** Significant ($p < 0.001$) deficit of the EC and metabolic (mitochondria) machinery in lower vs upper motoneuron SCI lesions. Marked muscle atrophy not correlated to years of injury or capacity of generating force. 45% of fiber size reduction was reported with respect to able-body individuals (AB) at 12 months post injury in upper motoneuron SCI, despite an spastic activity steady thereafter up to 20 years. Severe muscle atrophy at 8 months post injury in lower motoneuron SCI subjects, 56% reduction with respect to upper motor neuron SCI and 2-3 times more with respect to AB, with a tendency to be progressive over the first three years post injury steady thereafter up to 8 years. Muscle force was dramatically reduce in both SCI group, quadriceps strength was recorded as 3%-4,6% Nm of the total normal force present in AB. Lower motoneuron force was difficult to be recorded and range between 0,032%-0,41% Nm of the total force related to normal. 10-15 μ m muscle fibers in presence of anti-N-CAM antibody represent denervation and 17-23% of the muscle fibers in the upper motoneuron group may have this characteristics despite a relative short period of SCI (1 year) and of spasticity. **Conclusion.** If surface FES is to be used, determinants for muscle recovery need to be considered. Muscle may recover depending in type of SCI, remnants of excitable and metabolic muscle tissue, and FES parameters (duration, intensity and frequency) of stimulation. The lost in part or totally of the EC and metabolic machinery is critical for electrical propagation (periphery to center), fuel utilization and production, as well as for EC-coupling and are at the base for the difficulties encounter in FES treatment in paraplegics subjects. Strength and endurance will depend in the ability of FES to obtain plastic remodeling of the muscle fibers substrate, knowing that FES pattern of motor unit recruitment is limited by type of SCI, stimulation parameters, ontogenetically muscle fiber type differentiation and muscle remnants of metabolic and excitable tissue.

Treatment of disorders of neurological disability in mobility in inclusive tourism

G. Arbosti, L. Pignataro, G. Filippini, D. Bonaiuti, P. Cornelio, N. Gianotti, F. Cornelio
Istituto Neurologico Besta

Introduction. The prevention and treatment of mobility disorders in neurological disability is represented by a global multidisciplinary approach. This model focuses on the person and his own needs including the assessment of accessibility and the styles of life in an inclusive tourism. **Materials and methods.** Analyzing outcomes related to functional and psychological aspects, customer satisfaction and accessibility through operational tools that will be covered by a specific oral report. **Results.** The model of interrelation between the health, environmental and personal factors is presented through an assessment of pathways for rehabilitation and wellness with the introduction of the WHO ICF classification and reference made to UN Convention on the Persons with Disabilities. It is presented the issue of accessibility for an inclusive tourism. **Conclusion.** Demonstrate a method which combines operational tools and accessibility, in order to determine an improvement in the response to the needs of people with disabilities. It's in progress a project based on Rehabilitation spa, whose validity is to verify through practical application. From disability towards a concept of needs.

References

Atti Convegno Internazionale "Neurologia del III Millennio", 2009
Libro bianco "La vita buona nella società attiva", Ministero del Lavoro 2009
Manifesto per la promozione del turismo accessibile, Ministero del Turismo
The Neck Disability Index, Hains F, Waalen J, Mior S. Psychometric properties of the neck disability index. J Manipulative Physiol Ther. 1998
Tesio L., Special report. Measuring person's behaviours and perceptions: Rasch analysis as a tool for rehabilitation research. J. Rehabil. Med. 2003
Wade DT., Barriers to rehabilitation research, and overcoming them (Editorial), Clin Rehabil 2003

OPIN – A Permanent Observatory on Neurorehabilitation – A interregional experience

N. Gianotti¹, A. Compostella¹, C. Gallo¹, F. Cornelio², A Lalli¹, G. Arbosti²
¹ARSS-Veneto
²Istituto Neurologico Besta

Introduction. The scope is to develop knowledge, to give visibility and to diffuse information on technological, organizational and applied research innovations in the field of neuro-rehabilitation. We created a Permanent Observatory, OPIN, based on two main elements: a website portal as "virtual hub" for exchanging and diffusing information/knowledge about activities on Accessible tourism, Tele-rehabilitation & Technology, Rehabilitation outcome measures; periodic residential appointments as "physical hub". **Materials and methods.** Application of European regulations for accessible website and privacy. Web Accessibility Initiative (WAI)-World Wide Web Consortium (W3C)Tecnica development by IWA/HWG and law proposal by Scientific research italian Minister, (Stanca). Knowledge management methodology and tools, team building skill, intra- inter groups communication. **Results.** At the moment the virtual hub (portal) has been created and is working with satisfactory participation. Actual statistics will be shown at the Congress. Physical hubs are on the way of being developed. **Conclusion.** As the "motto" of the Observatory project is "think globally, act locally" the final objective of OPIN (arrival point of the started project process) is twofold: to create an "incubator" for innovation in the field and to build an appropriate "hub" and "market place", turning OPIN into concrete events of confrontation among *demand entities and individuals and supply entities* (industries, distributors, services providers).

References

B.Chludry, J. Wang, S. Wu et al, Systematic Review: Impact of Health Information Technology on Quality, Efficiency, and Costs of Medical Care, Annals of Internal Medicine, 2006.
Tesio L. La valutazione funzionale in Medicina Riabilitativa. Encycl. Méd. Chirurg, Elsevier Italia, Fasc 26.

Accessibility, clinical rating scales and costumer satisfaction of the person with neurological disability: operational tools

L. Pignataro¹, P. Cornelio¹, G. Bodini¹, L. Pressato², C. Gallo²
¹Istituto Neurologico C. Besta
²ARSS Veneto

Introduction. The importance in measuring outcomes in the model of prevention and treatment is based on solid and validated operational tools. The measurement of functional and psychological aspects as well as the satisfaction of the person and the accessibility of structures plays a key role in neurological disability. **Materials and methods.** Among the tools we study the accessibility as well as the set of services and facilities that enable people with special needs. Is presented in detail a list of characteristics that define people with special needs for the purposes in an inclusive tourism. The clinical rating scales include monitoring indicators of disability whereas personal care daily activities, pain assessment and management of leisure time. For the assessment of customer satisfaction is considered a specific questionnaire. The questions of the survey are grouped into three areas: the organizational area, the area of comfort and the area of professionals. **Results.** Clinical rating scales. Customer satisfaction scales. Accessibility evaluation scales. A selection of ICF items. **Conclusion.** Apply the concepts through operational tools in order to quantify the quality of life, of service and accessibility.

References

The Neck Disability Index, Hains F, Waalen J, Mior S. Psychometric properties of the neck disability index. J Manipulative Physiol Ther. 1998 Feb; 21(2): 75-80.
Regione Lombardia, Legge Regionale n° 31- Norme per il riordino del SSN e sua integrazione con le attività dei servizi sociali. 11 luglio 1997.
Regione Lombardia - Delibera Regionale n° 7/8504 del 22 marzo 2002 – "Qualità percepita dei servizi sanitari".

An example of cooperation for inclusive tourism: assessment of accessibility to passengers in Venice Port

C. Massaro¹, P. Tonin¹, F. Sensini¹, C. Gallo², N. Gianotti²
¹IRCCS Ist. San Camillo
²ARSS Veneto

Introduction. To permit the full accessibility to the centre of the historical city, avoiding any limitation in the participation of people

with disabilities and promoting the inclusive tourism, a research project on the Port accessibility for the passengers, inside the cooperation between IRCCS San Camillo and the Authority of Port of Venice, has been formalised. The first aim of the project is to establish a new model of organization and management of the offer to create an Accessible Port. The second aim is to share this new model with other ports, to achieve an uniform employment of this offer, by means of a procedures' standardization, until the feasible proposal of touristic packages with these features. **Materials and methods.** Both, the ship services, supplied by the shipping companies, and the front services, supplied by "Venezia Terminal Passeggeri", will be analyzed. **Results.** The project perspectives include: the enlargement of the accessibility to other disabilities over the motor one, such as cognitive, psychiatric and geriatrics disabilities; the possibility to create an embedded certification (quality/safety/environmental) of the specific paths/procedures; the enrichment of the specific utilities on board, such as the presence of health professionals for specific training; the comparison with other transport solutions. **Conclusion.** The city of Venice considering both its criticism and singularity looks as the best location to experiment adequate and innovative solutions.

References

Manifesto per la promozione del turismo accessibile, Ministero del Turismo
 Architettonic barriers for elderly and physically disabled people: an epidemiological study of the physical structure of health service units in 7 Brazilian states, Siqueira, Facchini, Piccini, Cien Saude Colet 2009

The Electronic Medical Record in Rehabilitation: Clinical integration and computerization of Rehabilitation Pathways in Neurology, Orthopedics and Cardio-Pneumology at the Villa Margherita Hospital

R. Di Mizio, A. Ciarimboli, A. Del Monaco, R. Della Cagna, L. Del Sordo, C. Iannella, M. C. Penna, V. Vozza, G. Nalon, A. Pastorio, A. Rizzetto, F. Cortese.

Hospital Villa Margherita provides medical intensive and extensive rehabilitation in two sites in Italy: Benevento and Vicenza.

Introduction. The two facilities, with 286 beds, over several years have been running process of continuous improvement of efficiency and effectiveness through multiple interventions at different levels: The adoption of therapeutic protocols and innovative diagnostic guidelines. The certification of quality released on 2006 by Sincert. The extensive and intensive use of IT tools in support of the ward activity, which have been introduced 8 years ago and are now a indispensable support in therapeutic processes. **Materials and methods.** The Electronical Medical Record was introduced in the wards through a two stages programme: In 2002 we started managing: personal data; rehabilitation project; diagnostic reports (laboratory, imaging, consultant visit); functional tests; periodic medical evaluations. Since 2004 all patients have an IT clinical record that allows: a quick consultation of historical as well as current information recorded from the admission; the circulation of information among all professionals concerned in the rehabilitation project: doctors, nurses, therapists. In 2009 the clinical record has been further extended on medical and nursing workflow process allowing the management of: the daily clinical record, supporting the application of clinical rehabilitation protocols; the nurse clinical record, accessible also to doctors and therapists. The EMR software manages also the social activities with the involvement of family members in regular meetings that are tracked in the system, recording meeting minutes, objectives and results. Other functions which are almost ready to be introduced in the system are: the management of the assessment and treatment of neuropsychological and speech therapy; the management of socio-environmental history made by the social workers **Results and conclusion.** The experience gained during these years allowed us to develop a system, certificated and integrated, which permits evaluations and comparison of outcome: the rehabilitation clinical record is now shared among all those involved in the rehabilitation project giving uniformity to our activity; the IT system actually is the irreplaceable engine of the process of care.

References

1. A.L. Rettore, W.A. Nolan, S. Kay. Foundations for an Electronic Patient Record. Medical Informatics Group Department of Computer Science. University of Manchester
2. Horan B, Rettore AL, Sneath EL, Goble. CA, Howkins TJ, Kay S, Nowlan. WA, Wilson A. Supporting a humanely impossible task: the clinicalhuman-computer environment. In Diaper D, eed. Proceedings of interact 90, Amsterdam: Elsevier science Publ. 1990:247.

Disease and disability: the role of the physical medicine specialist in the definition of need and opportunities

G. Filippi

Director, Department of Rehabilitation, Az. U.L.S.S. no.4 "Alto Vicentino", Veneto Region

Introduction. In the last twenty years there have been a lot of changes in the culture of rehabilitation medicine, as in the society, in terms of capability to understand the needs of disabled people. Thus the accessible tourism (now defined as "inclusive tourism") becomes an opportunity of full self-realization of the disabled person and his/her general wellbeing. It is possible to find three different levels of tourism: the first one is health-related; the second one has "relief" aims; the third one is the management of one's own free time (which neglects the "health-related" aspect). **Materials and methods.** In the last years many researches have been analyzed on these themes, as the ITER/ENEA research (1999) and the TOUCH-ROSS report of the 1993. Then many guides (as the "Guide to Accessible Tourism", 2003) have been written and consulted and a lot of projects studied, like the C.A.R.E. project (Accessible Cities of the European Regions, 2004), to find the needs of people who have special requests in relation with tourism. **Results.** In the ITER/ENEA research 9 groups of people/clients "with special needs" were identified (in relation with the different kinds of deficits they had: physical ones; sensorial ones; dietary problems). Then that study the reasons why those disabled people decided not to travel (61% for health reasons, 39% for general difficulties in getting around). The problem was to identify the conditions in which those "potential holidaymakers" would have travelled: 61% of those indicated the need for a companion, 25% the availability of medical care and 7% the problems related to architectural barriers. **Conclusion.** To give an answer to these requests, the C.A.R.E. project of the European Community proposed the IG-VAE method (Information Guaranteed for the Evaluation of Accessibility for Own Requirements) to allow everyone to evaluate the different structures and services, in relation with personal needs, to reach the model of a city "hospitable for all".

References

ITER/ENEA 1999 on the site <http://www.italiapertutti.it>
 Fantini L., Matteucci M.E., "Guida al turismo accessibile", Edizioni Airplane, Bologna 2003
 CARE News, European Community, n.1, Year 1, April 2005

Selftreatment of lymphedema in the upper limb after breast cancer surger

F. Coppadoro

U.O. Medicina Riabilitativa A.O. Fatebenefratelli e Oftalmico, Milano, Italy

Introduction. This work suggests the use of techniques of self-treatment (1) as an integration of the classic combined treatment for patients affected by lymphedema of the upper limb after a mastectomy or quadrantectomy with axillary dissection (2, 3). **Materials and methods.** 30 patients (aged from 42 to 74) with upper limb lymphedema have been treated. Their parameters, their physical examinations and the features of the lymphedema have been valuated with a physiatric visit. Cooperation, compliance to the program, motivation, absence of relevant functional limitation in the use of the upper limbs and absence of controindications to lymphodrainage have been taken as fundamental presupposition for the involvement of the patients in the study. The study involved 10 sessions of one hour (3 sessions per week). After the patient had been told some theoretic notions, the physiotherapist taught them the procedure of the self-drainage, self-bandaging, respiratory rieducation and mobilization. The lymphedema had been measured before and after the treatment with centimetric method. **Results.** The amount of the differences measured at different level between the two limbs has been defined as delta. The deltas measured before and after the treatment have been compared and have been expressed with the rate of modification obtained. A reduction of the delta of 25% or more has been accepted as a positive response to the treatment, an improvement of 25% or more has been taken as a worsening, while a reduction or an improvement of the delta of less than 25% has been considered as a stable condition. The results showed that: all the patients obtained a decreasing of the lymphedema; 20 out of 30 patients (66,66%) obtained a positive response (reduction of the delta of 25% or more). **Conclusion.** The self-treatment of the lymphedema with self-lymphdrainage and self-bandage resulted a

technique easy to use for some selected patients. It can integrate (but not substitute) the classic treatment of the lymphedema, which is made by the physiotherapist, and results particularly usefull as maintenance therapy

References

1. F. Coppadoro: "L'autotratamento del linfedema post-mastectomia: partecipazione attiva della paziente come supporto al trattamento classico" , Ital J Rehab Med – MR 2008;22:255-63.
2. Michelini S., Campisi C., Ricci M., et al.: "Linee guida italiane sul linfedema" – Eur MedPhys 2007; 43 (Suppl. 1 to No.3).
3. Schieroni MP: "Riabilitazione della donna operata al seno per carcinoma mammario" In: Valobra GN, editor. Trattato di Medicina fisica e Riabilitazione. Torino: UTET; 2000. Cap. 128, p.2188-9.

Effects of a 6 week pulmonary rehabilitation program in patients with chronic obstructive pulmonary disease (COPD)

Andjic Mojsije, O. Ilic Stojanovic, M. Lazovic
Institute for Rehabilitation, Belgrade, Serbia

Introduction. Pulmonary rehabilitation programs improve exercise tolerance, pulmonary function and dyspnea in patients with COPD. The aim of the study was to assess prospectively the effectiveness of pulmonary rehabilitation in patients with COPD. **(1) Materials and methods.** In a prospective, randomized study, patients with an established diagnosis of COPD participated in a 6-week multidisciplinary rehabilitation program. Sixty patients were divided into three groups. Group A, twenty patients with moderate COPD (64,5±5,9 of age, 14 men; FEV1 60,5±11,0). Group B, twenty patients with moderate COPD (64,20±6,3 of age; 14 men; FEV1 57,0±12,4) and group C twenty patients with severe COPD (61,7±7,2 of age; 15 men; FEV1 31,3±10,5). The 6-week supervised pulmonary rehabilitation program in groups A, B and C included respiratory physiotherapy. In group A was also included exercise training on cycle ergometry. All patients had stable COPD and medication therapy. Pulmonary function, exercise tolerance and dyspnea were measured after 6 weeks of rehabilitation. Exercise tolerance was assessed by measuring the distance each patient walked in six minutes, and dyspnea assessed using the Medical Research Council (MRC) scale. **Results.** The difference in distance covered on the walk test (6min) between groups A and B (p<0,05), A and C (p<0,01) and B and C (p<0,01) was statistically significant improved after 6-week rehabilitation. Dyspnea also improved after rehabilitation with the best results in group A. MRC (p<0,01) and FEV1% increased results significantly (p<0,05) in group A. **Conclusion.** After the 6-week multidisciplinary rehabilitation program in patients with COPD significant improvement in pulmonary function, exercise tolerance and dyspnea has been seen in the patients who participated in the exercise training, particularly in group A. The rehabilitation program improved exercise tolerance independent of disease level.

References

1. The dose effect of pulmonary rehabilitation on physical activity, perceived exertion, and quality of life. Hassanein SE, Narsavage GL, j. Cardiopulm Rehabil Prev 2009; Jul-Aug ;29(4):255-60.

Thalassotherapy methods in rehabilitation of patients with chronic venous insufficiency

N. Trukhacheva, V. Badtjeva
The Russian Scientific Centre for Restorative and Resort Medicine, Moscow, Russia

Introduction. Lately in Russia rapid development of hi-tech industry SPA (thalassotherapy) by use of various kinds of pack is observed, the most effective and often applied from which are seaweed pack. Brown seaweed contains in the structure a significant amount micro- and macro cells (iodine, zinc, chrome, selenium, calcium, iron, magnesium), and also produces the whole spectrum of biologically active substances which great bulk make various polysaccharide, such as alginate, fucoidan. **Materials and methods.** We surveyed 30 patients with chronic venous insufficiency (3-5 stages on the international clinical classification), which have been divided into 2 groups: 1-st group (control) - medicamentous therapy (Detralex on 1 capsule 2 times a day) and adequate compression therapy medical elastic compression products (I-II compression class); 2-nd group - application SPA technologies (cold seaweed pack) on the lower extremity "high boots". **Results.** As a result of the spent researches higher therapeutic efficiency is established in the

group receiving cold seaweed pack. Positive dynamics of clinical indicators is established: reduction of the edematous syndrome, reduction of developments of stagnation in the lower extremity to what improvement of venous outflow testified is established on shins on 21% and on foot on 16%. Realization of therapeutic action was carried out through improvement of processes of microcirculation. **Conclusion.** Thus, joining to standard medicamentous treatment and elastic compressions of thalassotherapy methods (cold seaweed pack) raises efficiency of conservative treatment of patients with chronic venous insufficiency at the expense of influence of biologically active components of brown seaweed, promoting improvement of processes of microcirculation, lymph drainage functions, peripheral haemodynamics that leads to reduction of hypoxia, to improvement of the tissue trophics, to anti-inflammatory effect.

References

- Tolokonin A.O., Razumov A.N. - World improving systems in practice of restorative medicine, - Medicine, Moscow, 2007.

Confronto tra due diverse formulazioni di acido ialuronico per via intra-articolare nel trattamento della gonartrosi

A. Lucangeli, L. Marangon, M. Gugelmetto, M. Callegaro, D. Primon
Dipartimento di Medicina Fisica e Riabilitazione. P.O. Camposampiero A. Ulss 15 Alta Padovana

Introduction. In Italia l'artrosi è l'affezione reumatica che si riscontra con maggior frequenza colpisce circa 4 milioni di Gli studi epidemiologici che si basano sulla diagnosi radiologica indicano una prevalenza di malattia pari a circa il 50% della popolazione compresa tra i 15 e 79 anni da sola rappresenta il 72,6% di tutte le malattie reumatiche. Le sedi più frequentemente colpite sono in ordine decrescente: la colonna lombare (33%), la colonna cervicale (30%), le ginocchia (27%), le anche (25%) Scopo di questo lavoro è stato quello di valutare la risposta ad un trattamento infiltrativo con due diverse formulazioni di acido ialuronico in due gruppi di pazienti affetti da patologia artrosica, con localizzazione principale alle ginocchia. **Materials and methods.** A questo scopo sono stati arruolati consecutivamente 10 casi di gonartrosi, e in modo del tutto casuale 5 sono stati indirizzati verso il gruppo che prevedeva l'esecuzione di 5 infiltrazioni a cadenza settimanale di Acido ialuronico tradizionale (2 cc di soluzione all'1% di concentrazione con peso molecolare tra 800000 e 1 M di Dalton Gruppo H), gli altri 5 verso l'utilizzo di una formulazione di acido ialuronico a doppia camera in unica siringa (0,7cc a basso peso molecolare 1M Dalton ad alta concentrazione 2.2% e 0.7cc ad alto peso molecolare 2M Dalton a bassa concentrazione 1% Gruppo R) per eseguire 2 infiltrazioni a cadenza settimanale. I pazienti sono stati valutati secondo indici algofunzionali (Lequesne Samson e scala VAS) in tre momenti diversi: prima, dopo, a tre settimane dal trattamento effettuato. I dati raccolti sono poi stati sottoposti ad indagine statistica. **Results.** Dopo 3 settimane dalla conclusione del ciclo infiltrativo sono stati rivalutati gli indici iniziali: i valori medi della VAS e della LS hanno dimostrato in entrambi i gruppi un miglioramento soggettivo con valori confrontabili, nel gruppo H un unico paziente ha indicato un peggioramento soggettivo (VAS) rispetto ad indici nella scala LS di leggero miglioramento. **Conclusion.** Pur con i limiti del breve periodo di osservazione, l'analisi dei dati evidenzia un vantaggio nell'utilizzo della formulazione di acido ialuronico a doppia camera in unica siringa sia per il miglior risultato nella valutazione degli indici algofunzionali, sia per la riduzione del numero di infiltrazioni necessarie

References

- Petrella R.J. et al. Combining two hyaluronics acids in osteoarthritis of the knee: a randomized, double blind, placebo controlled trial. In Clin reumatologic 10.1007/s10067-007-0834-4.

Rehabilitation Goals: Too Easy or Too Hard?

Fahim Anwar, Ahmad Al-Khayer, Bhupinder Panesar
Physically Disabled Rehabilitation Unit, Southern General Hospital, Govan, Glasgow, United Kingdom

Introduction. The goal of the rehabilitation process is to promote the full integration of individuals with disabilities into the society. This goal can be achieved from a process in which deficiencies in life skills are accurately diagnosed and reduced or removed via targeted rehabilitation services. Goal Attainment Scale (GAS) is a measurement methodology introduced by Kiresuk and Sherman in 1968

for evaluation in mental health services. The aim of this study was to access goals on Goal Attainment Scale and rise in FIM score and to evaluate whether our goals are challenging for the patients. **Materials and methods.** Retrospective analysis of all the goals planned and their achievement on Goal Attainment Scale in neuro-rehabilitation along with changes in FIM scores during inpatient rehabilitation from July 2006 to December 2006. **Results.** A total of 360 outcome goals were planned. 62% achieved most likely outcome, 16% of the goals had more or much more than expected outcome whereas 22% of goals had less or much less than expected outcome. Mean rise in Functional Independence Measure (FIM) score was 20 and a median of 31.5 during the inpatient rehabilitation stay. **Conclusion.** In rehabilitation settings, Goal Attainment Scale has shown superior sensitivity to changes compared to other functional outcome measures. It has excellent inter-personal reliability and satisfactory concurrent validity with other outcome measures. The use of Goal Attainment Scale is recommended in planning ongoing rehabilitation process, evaluating the quality of goals planned and monitoring the targeted rehabilitation programmes.

References

1. Kiresuk, T.J., & Sherman, R.E. Goal attainment scaling: A general method for evaluating comprehensive mental health programs. *Community Mental Health Journal*, 1968; 4:443-453.

Effectiveness of combined treatment of botulinum toxin, biofeedback, electrical stimulation and physiotherapy in chronic pelvic floor

G. Ianieri, M. Ranieri, R. Marvulli, G. Tondi, S. Miccoli, L. Mastromauro, E. Romanelli, M. Megna, G. Megna

Neurological and Psychiatric Sciences Department, Physical Medicine and Rehabilitation University of Bari, Italy

Introduction. Purpose of this study is to determine the effectiveness of botulinum toxin therapy, combined with pelvic floor rehabilitation techniques, for the treatment of pelvic floor dissinergia's. **Materials and methods.** Between January 2005 and August 2009, 15 patients (4 women and 11 men), after manovolumetria anus rectal exams, were subjected to EMG-guided inoculation of TB in the four quadrants of the external anal sphincter. After infiltration, patients were subjected to two sessions a week of biofeedback, electrical stimulation and physiotherapy for a total of 8 sessions. **Results.** After 4 weeks, patients underwent clinical and anorectal manovolumetria exams. All patients were free of symptoms without any side effects. A questionnaire (0 = not at all, 10 = very satisfied) assessed overall patient satisfaction (averaged 9.26, p <0.001). It also demonstrated a significant reduction in tone to manovolumetria anorectal at rest (from 54.26 to 24.6, p <0.001) and decrease (from 146.86 to 115.4, p <0.001). **Conclusion.** Combined treatment of TB, biofeedback, electrical stimulation and physiotherapy is very effective and without side effects. Patients can therefore avoid the common therapy drug, such as the local treatment with nitrates, often ineffective and poorly tolerated because they can cause the onset of headaches.

References

1. Katsinelos P, Papaziogas B, Koutelidakis I, et al. Topical 0.5% nifedipine vs. lateral internal sphincterotomy for the treatment of chronic anal fissure: Long-term follow-up. *Int J Colorectal Dis* 2006;21:179-83.
 2. Witte ME, Klaase JM. Botulinum toxin A injection in ISDN ointment-resistant chronic anal fissures. *Dig Surg* 2007; 24: 197-201.
 3. Madalinski M, Chodorowski Z. Relation between botulinum toxin and nitric oxide donors in the treatment of the chronic anal fissure. *Med Sci Monit* 2005; 11: HY1-HY5.

UEMS PRM Section and Board webpages and e-learning activities

S. Moslavac¹, N. Barotsis², N. Christodoulou³

¹Croatia

²Greece

³Cyprus

UEMS PRM (European Union of Medical Specialists – Physical and Rehabilitation Medicine) Section and Board has a long history of internet presence, starting in 1996. The mission of the official website is to support and promote the activities of Board, Professional Practice and Clinical Affairs Committees. Homepage (www.euro-prm.org) presents information about the organization and activities of the Section and its committees, news, announcements, links, con-

tact details and a private area dedicated to delegates. Board registration, certification and recertification procedures for PRM doctors, trainees, trainers and training centres are thoroughly explained and guided through downloadable application forms. Accredited events, fellows, delegates and certified centres are listed, providing trainees with synthetic forms of the accredited training centres. UEMS PRM Board, aiming to promote distant and lifelong learning, created the e-learning platform (www.euro-prm.org/elearning) in 2009. The concept of this interactive auxiliary website is to enhance communication between registered trainees and fellows across Europe and to provide selected online educational resources. Forum, e-books, self assessment activities and collections of educational links are available online. E-learning users regularly receive the official newsletter, announcements regarding educational activities and scientific events. Surveys conducted online, make the e-learning platform an important source of feedback for the Board. Professional Practice Committee dedicated its place to the Field of PRM Competence, in general info on running projects and activities as White Book, guidelines, system of organization & payment of PRM services, and position of PRM towards other professionals in health care system and within specific items in the field. Clinical Affairs Committee lists procedures for accreditation of PRM programmes of care and displays already registered programmes for the public, aiming at providing accurate information about PRM clinical practice throughout European countries, to foster exchanges of experiences between PRM specialists and to gradually improve the "Quality of PRM Care" for all European patients.

A comparison of therapy in localized lipodystrophy treatment

R. Saggini, L. Di Pancrazio, P. Iodice, V. Piscicella, R.G. Bellomo

Department of Basic and Applied Medical Sciences, University "G. d'Annunzio", Chieti (Italy).

Introduction. Incipient cellulite recognized by an "orange peel" appearance represents focally enlarged fibro-sclerotic strands partitioning the hypodermis and limiting the out-pouching of fat lobules. In contrast, full-blown cellulite recognized by a dimpled skin surface represents subjugation of the hypertrophic response of the hypodermal connective tissue strands when the resistance is overcome by progressive fat accumulation (in subjects with high body mass indexes) forming papillae adiposae that protrude into the lower reticular dermis.(1,2) The aim of this study was to assess the efficacy and safety of this new non-invasive focused ultrasound system at 34 KHz frequency with Multicell-1 linked with manual lymphatic drainage (Vodder method) and diet in reducing localized fat deposits to improve body contours. **Materials and methods.** 20 female, non-pregnant, of age between 25 and 50 years with lipodystrofy parameters were selected and divided into 2 homogeneous groups (based on stage, type and location of lipodystrofy). Group 1: treated with diet, low frequency ultrasound and manual lymphatic drainage (Vodder method); 10 sessions, 2 times/week, for 2 weeks and then 1 time/week for 6 weeks. Group 2: treated with diet, physical compressive treatment and manual lymphatic drainage (Vodder method); 10 sessions, 2 times/week, for 2 weeks and then 1 time/week for 6 weeks. Before and at the end of treatment, all patients were evaluated by clinical examination, BIA(Body Impedance Analyzer), fat thickness and circumference measurements. **Results.** Body weight and fat mass (FM) decreased in greater proportion in group 1. In group 1 Fat Free Mass (FFM) and muscle mass increased (p <0.1), and fat mass decreased (p <0.1). In both 2 groups the percentage of TBW (Total Body Water) did not increase significantly. The circumference of the treated areas decreased in greater proportion in group 1; the examination of fat thickness showed a greater reduction of adipose tissue in group 1. **Conclusion.** This study shows the efficacy and safety of focused ultrasound, as a non-invasive transdermal method for reducing unwanted fat deposits in the body.

References

Angehrn F, Kuhn C, Voss A. Can cellulite be treated with low-energy extracorporeal shock wave therapy? *Clin Interv Aging*. 2007;2(4):623-30.
 Kuhn C, Angehrn F, Sonnabend O, Voss A. Impact of extracorporeal shock waves on the human skin with cellulite: a case study of an unique instance. *Clin Interv Aging*. 2008;3(1):201-10.

Integrated water treatment rehabilitation in occupational neck pain, myometry and emgs investigation

P. Iodice¹, L. Di Pancrazio¹, V. Piscicella¹, G. Barassi², C. Aventaggiato², R.G. Bellomo¹, R. Saggini¹

1Department of Basic and Applied Medical Sciences, University "G. d'Annunzio", Chieti (Italy).

2Medicine Sports University Center, Chieti (Italy).

Introduction. The aim of our study was to evaluate the influence of a specific rehabilitation treatment in water versus the use of a collar stabilizer type Doctor Disk, on a sample of patients with neck pain who play or have played in the past work activities characterized by repetitive movements of upper limbs. **Materials and methods.** 30 patients, aged between 45 and 60 years, female, all suffering from neck pain were randomly divided in two groups: Group W was treated for 8 sessions, 2wk, each lasting about 45 minutes of therapy in water to which you add about 15 minutes of warm-water pre-treatment. Group D utilized was treated with the use of neck support such as "Doctor Disk" (Smart Hospital, Italy) for 1 months to 3+3 hours per day. At the beginning and end of rehabilitation program all subjects were tested with myometry and algometry, EMGs of the trapezius muscle in different experimental situations: at rest, the head twisted right and left, during isometric contraction of left and right, back to sleep. **Results.** Results obtained from the survey showed an improvement of the myometrium elastic component of muscle at rest (T0 1.23 ± 0.13 vs T1 1.01 ± 0.01) and isometric contraction (1.27 ± 0.29 VS1, 04 ± 0.12). The Muscle Stiffness decreased after treatment of 11.5%. Muscle tone does not show significant changes (17.04 ± 1.15 vs $16, 19 \pm 0.72$). The data showed EMGs after rehabilitation treatment, a decrease of the antagonist muscle during the twisting movements of the head and during isometric contraction. **Conclusion.** Integrated treatment in water allows the natural need for balance tonic postural through motor stimulation, thermal microgravitation and manual even after repetitive traumatic phenomena type of employment.

Postural ant-gravitational reprogramming in the elderly with flexed posture

R. Saggini, L. Di Pancrazio, V. Piscicella, P. Iodice, A., Marri, R.G. Bellomo
Department of Basic and Applied Medical Sciences, University "G. d'Annunzio", Chieti (Italy)

Introduction. The dorsal kyphosis or flexed posture is an important factor for functional limitation as triggers a cascade of events leading to progressive limitation of physical activity, loss of skeletal muscle mass and function, greater stiffness, reducing the balance control, increasing the risk of falls and consequently increase the risk of fractures. **Materials and methods.** Under investigation in the initial phase (T0) and at the end of treatment (T1): examination, Tinetti Balance Scale Evaluation, Stabilometry. Patients were divided into two homogeneous groups. Group A performed 3 times weekly for 4 weeks total therapy system SPAD. Group B performed 3 times weekly for 4 weeks total therapy in aquatic environment. **Results.** The results obtained at the time T1 has made clear, in both groups, a reduction of the load imbalance front breech, an increase of control's balance (Romberg index T0 63.5 vs T1 120) and body alignment expressed by bioposturale (IBP T0 35 vs T1 22) and a better distribution of forces on the ground during the binding step (T0 180.6 mm vs T1 202.7 mm; Pmax T0 1050 g/cm² vs T1 889 g/cm²). **Conclusions**

In the field of rehabilitation is increasingly recognized the need for constant updating that we can deal comprehensively with the problem of postural disabilities. The antigravitational approach allows new treatment protocols that meet the needs and demands of patients, with the aim of obtaining a greater capacity for locomotion, a better stability and thus a better quality of life for the elderly.

Postural instability in parkinson drug non-responder (atypical Parkinson)

R. Saggini, L. Di Pancrazio, P. Iodice, V. Piscicella, R.G. Bellomo
Department of Basic and Applied Medical Sciences, University "G. d'Annunzio", Chieti (Italy).

Introduction. Parkinson's disease is one of the most common neurodegenerative diseases caused by degeneration of dopaminergic neurons in the substantia nigra. The cardinal physical signs of the disease are distal resting tremor, rigidity, bradykinesia, and asymmetric onset.(1) In 1967, Martin JP. acknowledged that the loss of balance and the postural instability are observed at an early stage of

the disease, thus affecting gait quality on the fear of falling and general mobility.(2) The aim of the study was to improve postural control, gait cycle and to increase both muscular endurance and strength. **Materials and methods.** 10 patients (7 male; 3 female) age ± 64 years, non-responsive to drug therapy with L-Dopa were recruited. All patients were treated with: SPAD (Dynamic Antigravitational Postural System) 2 sessions/week (20 min) for 2 months. Viss(Vibration Sound System) 3 sessions/week (15 min) for 2 months. Active stretching 2 sessions/week (10 min) for 2 months. Before, after the end of the treatment and at a 1 month follow-up, all patients performed a battery of tests: Stabilometry (StT), static and dynamic baropodometry, and Body Analysis Kapture (BAK); Myometry; Scale Assessment: Berg Balance Scale (BBS), Hoehn and Yahr Staging, Unified Parkinson's Disease Rating Scale. **Results.** Evaluation of StT showed an improvement of stability, decrease sway area ($p < 0.05$) and ellipse surface ($p < 0.05$). Static Baropodometric analysis showed a better distribution of plantar pressures. The gait analysis shows an increase of the step length and the bearing surface of both feet. All improvements persisted at follow-up 1 month later. **Conclusion.** Our work has emphasized the existence of new rehabilitation techniques for patients with Parkinson's disease. Since postural instability and the risk of frequent falling can severely compromise the quality of life of these patients, they should be introduced to a rehabilitation program at an early stage in order to improve posture and balance.

References

- Rao SS, Hofmann LA, Shakil A. Parkinson's disease: diagnosis and treatment. *Am Fam Physician.* 2006 Dec 15;74(12):2046-54.
Franchignoni F, Martignoni E, Ferriero G et al. Balance and fear of falling in Parkinson's disease. *Parkinsonism Relat Disord.* 2005 Nov;11(7):427-33. Epub 2005 Sep 9.

Proprioception and prevention in dancers by vrrs training

R. Saggini¹, P. Iodice¹, L. Di Pancrazio¹, V. Piscicella¹, G. Barassi², R.G. Bellomo¹

1Department of Basic and Applied Medical Sciences, University "G. d'Annunzio", Chieti (Italy)

2Medicine Sports University Center, Chieti (Italy)

Introduction. The need for superior performance in dance has impelled teachers and choreographers to use increasingly effective and sophisticated methods of preparation. Biomechanics may also help dancers to assess fitness levels, to control overtraining or "burnout," and assist them and their teachers in the effective scheduling of practice and exercise sessions.(1) Previous studies evidenced that motor training applied in a virtual environment, by means of an augmented feedback, promotes motor learning in normal subjects.(2) The aim of the study was to show how the aid of a new rehabilitative approach, i.e. VRRS® (Virtual Reality Rehabilitation System), could decrease the incidence of injuries linked to the perception of movement in dancers by means of training sessions providing visual and auditory feedbacks that aimed at improving daily performance and, where needed, also improving and balancing the distribution of static and dynamic local and global loads. **Materials and methods.** Methods. 15 dancers were recruited, randomized into 3 homogeneous groups: Group A: training with the VRRS (the therapist explained the exercises only at the first sitting). Group B: training under the supervision of the physiotherapist. Group C: training without the physiotherapist. The training provided 2 weekly sessions, for 1 month, of 10 proprioceptive dancing exercises, to improve performance. Before, after and at a 3-month follow-up after the end of the treatment, all patients were evaluated by Stabilometry test (StT), static and dynamic baropodometry test, Body Analysis Kapture (BAK) and Myometry test. **Results.** Significant improvements were shown only in the first 2 groups. Evaluation of StT showed an improvement of stability, decrease sway area ($p < 0.05$) and ellipse surface ($p < 0.05$). Static Baropodometric analysis showed a better distribution of plantar pressures and BAK measurements showed an improvement of ROM. All muscle parameters improved. All improvements persisted at follow-up 3 months later. **Conclusion.** Our data indicated that motor learning in order to improve performance in dancers was promoted by the VRRS and assisted training. We could say that the use of virtual reality dovetails with the traditional work of the physiotherapist optimizing the results of the training.

References

- Koutedakis Y, Owolabi EO, Apostolos M. Dance biomechanics: a tool for controlling health, fitness, and training *J Dance Med Sci.* 2008;12(3):83-90.
Todorov E, Shadmehr R, Bizzi E., Augmented feedback presented in a virtual environment accelerates learning of a difficult motor task. *J Motor Behav* 1997;147:58.

Retrospective study on long-term efficacy of eswt treatment in rotator cuff syndrome

R. Saggini, L. Di Pancrazio, P. Iodice, V. Piscicella, R.G. Bellomo
Department of Basic and Applied Medical Sciences, University "G. d'Annunzio", Chieti (Italy).

Introduction. Degenerative rotator cuff disease is the leading cause of shoulder pain [1,2]. Recent studies have demonstrated the effectiveness of shock waves (ESW) in the stimulation of growth factors, induction of angiogenesis and the healing of fractures and wounds. The aim of our study consisted to observe the modifications in patients pain-thresholds after ESWT treatment in subjects affected by rotator cuff syndrome. **Materials and methods.** 394 patients (age 55 years), with rotator cuff syndrome (stage I, II and III) treated with 3 session, 1/week of extracorporeal shock waves and ten sessions, 2/week of rehabilitation exercise, for 1 month. All patients evaluated by clinical examination and instrumental investigations (radiography, ultrasound or MRI) and by clinical evaluation, VAS scale at the begin (T0), at the end (T1) and 5 years (T2) after the end of treatment. **Results.** At the end of the treatment (T1), VAS decreased from 7,75 to 2 (p<0,001). The 80% of patients showed a pain significant reduction at the end of treatment and it persisted at the follow-up of the second year, 86% at the third year, 80% at the fourth year. In 28 patients pain persisted after the treatment and they had recourse to other therapies. Ten of these patients had humeral biceps tendinopathy and they showed a pain significant reduction at the end of the second cycle of treatment. In the second year only the 19% of patients had recourse other therapies, the 40% at the third year and 33% at the fourth year. Further only the 6% of patients recurred to surgery. Our study shown a significant reduction of drugs assumption in the first 3 years. **Conclusion.** With its good tolerance, safety, and clinical-radiological response, ESWT should be considered as an alternative treatment for rotator cuff syndrome (stage I-II-III) of the shoulder refractory to conventional treatments.

References

Beaudreuil J. et al. Contribution of clinical tests to the diagnosis of rotator cuff disease: a systematic literature review. *Joint Bone Spine.* 2009 Jan;76(1):15-9. Epub 2008 Dec 6.
 Roquelaure Y, Ha C, Leclerc A, et al. Epidemiologic surveillance of upper-extremity musculoskeletal disorders in the working population. *Arthritis Rheum* 2006;55:765e78.

Stroke patient rehabilitation in acute and post-acute phases: relationship between primary motor cortex and mirror neurons during actions observation

L. Dicandia¹, C. Laurentaci¹, P. Bucci Brucato¹, C. Rondinone¹, P. Paradiso¹, M. Megna²

¹*U.O. Medicina Fisica e Riabilitazione, Ospedale Madonna delle Grazie, Matera*
²*Cattedra di Medicina Fisica e Riabilitazione, Università degli Studi di Bari*

Introduction. The study aims to demonstrate the effectiveness of Mirror Therapy in stroke treatment, as during acute phase, as during post-acute one, making use video tapes and simulated actions. The mirror neurons activation could consent a precocious recovery of motor functions by means of motor tasks re-learning after cerebral injury. The study of PM&R unit, in collaboration with Internal Medicine Unit, Nuclear Medicine one and Integrated Home Assistance Service (ADI), propose to obtain positive recovery results in upper limb rehabilitation, taking in consideration the effectiveness of therapeutic model based on actions observation therapy and intensive functional training. **Materials and methods.** Ten patients with emiparesis, included age from 45 to 75, will be involved in our study immediately after the acute event, during admission in Medicine Unit. The experimental group will includes 5 patients that will perform Mirror Therapy treatment, in addition to classical rehabilitation training, making use video-tapes and following these therapies in Rehabilitative Day Hospital setting or Integrated Home Assistance one. **Results.** One case enrolled, a male 55 years old afflicted by left emiparesis, have been performed for six months, has obtained an excellent functional recovery, as gait training, as upper limb performances, such as demonstrated by SPECT observations. **Conclusion.** The study aims to demonstrate the effectiveness of observational therapy in stroke patients, in addition to traditional rehabilitation treatment, since the acute phase injury. This therapy performed precociously could accelerate the global rehabilitation recovery, accepting neuroplasticity, observed with SPECT.

References

G. Rizzolatti, C. Sinigaglia. "So quel che fai. Il cervello che agisce e i neuroni specchio". 2006.
 M. Iacoboni "I neuroni specchio- come capiamo ciò che fanno gli altri". 2008.
 V. Gallese, L. Fadiga, L. Fogassi. "Action Recognition in the Premotor cortex brain". 1996.
 G. Buccino "Action observation has a positive impact on rehabilitation of motor deficits after stroke". 2007.
 Sjoerd de Vries, Theo Mulder. "Motor Imagery and Stroke rehabilitation : a critical discussion". 2007.

Comparison of the effects of upper extremity progressive resistive exercises and endurance exercises in the rehabilitation of patients with spinal cord injury

Dost Gulseren, Y'ld'r'm Adem, Karabay ilkay, Dogan Asuman, Ozgirgin Nese

Ankara Physical Medicine and Rehabilitation Education and Research Hospital

Introduction. This study was to compare the effects of upper extremity progressive resistive exercises and endurance exercises performed with an arm ergometer in patients who had developed paraplegia due to spinal cord injury and to determine the effective exercise type for this group of patients. **Materials and methods.** A total of 19 spinal injury patients who had been hospitalized for rehabilitation were included in the study. The patients were randomized into 2 groups. The elbow flexion and extension muscle power of each patient was determined with the isokinetic dynamometer at the beginning and end of the study. The functional independence measurement (FIM) was used on each patient at the beginning and end of the study. **Results.** The PRE group, the disease duration 447±523.17 days while the same values were 249.56±248.84 days respectively for the ergometry group. The PRE group mean height was 168.80±7.76 cm, the mean weight 65.67±9.57 kg and the body mass index 22.079±2.15 while these values were 174.44±7.76, 65.67±9.57, and 21.55±3.02 respectively for the ergometry group. The FIM score increases between the pre-treatment and post-treatment periods were statistically significant in both the PRE and ergometry groups. There was an increase in the peak torque, work/body weight and peak torque/body weight values for both elbow flexion and extension after treatment in both the PRE and ergometry groups but these increases were more prominent in the PRE group. **Conclusion.** In conclusion, we demonstrated station studies with constant repetition at the mechanical exercise station in addition to conventional rehabilitation directed towards the upper extremities of paraplegic patients have positive physiological and functional effects and increase the quality of life.

References

Robert F. Zoeller, Steven E. Riechman: Relation between muscular strength and cardiorespiratory fitness in people with thoracic level paraplegia *Arch Phys Med Rehabil* 86:1441-1446 2005.

Chronic low back pain, depression and functional impairment: a correlation study

A. Montez¹, P. Figueiredo², J. Páscoa Pinheiro^{2,3}, M. Quartilho^{3,4}, J. Branco²

¹*Hospitais da Universidade de Coimbra, Portugal*
²*Serviço de Medicina Fisica e de Reabilitação dos Hospitais da Universidade de Coimbra, Portugal*
³*Faculdade de Medicina Universidade de Coimbra, Portugal*
⁴*Serviço de Psiquiatria dos Hospitais da Universidade de Coimbra, Portugal*

Introduction. Low back pain represents 18% of chronic pain. One in five chronic pain sufferers had been diagnosed with depression as a result of their pain and these two conditions are frequently associated. This study pretends to determine the relationship between low back pain, psychopathological symptoms and its influence in patients' quality of life. **Materials and methods.** This clinical study included 31 patients with chronic low back pain for more than 12 weeks, from both genders older than 40 years old and younger than 70 years old. Assessment tools included the following health questionnaires: Owestry Disability Index - version 2, Brief Symptom Inventory e Short-Form-36, in the Portuguese validated versions. **Results.** This sample obtained an "incapacity score" of 35,80%, corresponding to moderate disability. The quality of life of the patients with low back pain is globally poor and its physical

dimension is more affected than its mental dimension. It was demonstrated a higher prevalence of somatization ($r=0,000$) and depression ($r=0,039$) in this sample than in the general population. The Positive Symptoms Indice of Brief Symptom Inventory also has a higher value on this sample; which allows us to classify it as a population with a higher prevalence of emotional disturbances. There are significant correlations between these psychopathological dimensions and the total Oswestry Disability Index (incapacity) but not with the pain intensity. The pain resulting incapacity is associated with a lower quality of life. The quality of life is also lower when associated with somatization and depression, but it is essentially affected on its mental dimension. **Conclusion.** Low back pain is associated with more incapacity and its course is associated with psychological and social variables. It supports the importance of effective managing psychological factors and emotional distress when treating low back pain.

Assistive devices prescriptions: an experience based on governance principles

G. Buonanno¹, P. Balestreri², R. Giunta³, R. Lanzi², R. Nicolini²

¹U.O. PARE-RRF AUSL Piacenza

²U.O. Assistenza Integrativa e Territoriale, ASL Cremona

³Direttore del Servizio di Medicina Legale, ASL Cremona

Introduction. In last time we observed a growing demand of assistive technologies for disabled people, including older persons. They are increasing in life-span, life expectancy, frailty and disability. Those technologies are often expensive. The rigorous application of guidelines based on rehabilitative project and governance principles (suitability, efficacy, transparency, risk-management, continuous training, clinical audit) may guarantee the satisfaction of disabled persons rights, which is the primary target, and contemporary costs optimization. Moreover, a careful recover of assistive devices, no more used, can contribute at the same goal. **Materials and methods.** Disabled people came in Cremona District ambulatory. During the contact (visit for prescription or retest) we administer the Short Portable Mental Status Questionnaire (SPMSQ) for a brief cognitive evaluation, the Cumulative Illness Rating Scale (CIRS), autonomy scales (Barthel Index, IADL) and EuroQoL for self reported quality of life. **Results.** Preliminary results of this study, which is still in progress, are demonstrating until now that disabled people self report a better QoL ($0,48 \pm 0,38$ vs $0,44 \pm 0,30$) after devices prescription. Despite the major age, older disabled people are on average less dependent on ADL ($71,36 \pm 30,86$ vs $58,96 \pm 31,66$) and IADL ($13,8 \pm 5,09$ vs $11,44 \pm 4,95$) at the baseline; instead, QoL is less reported by older people ($0,43$ vs $0,45$), above all at the retest ($0,38$ vs $0,62$). **Conclusion.** Further results and further studies are necessary to confirm this trend which demonstrate the general satisfaction of patients because of devices prescription and could demonstrate the less compliance of elder persons towards assistive devices utilization, versus younger disabled people.

Developmental age and motor function levels in children with cerebral palsy

Dogan Asuman, Y'ld'r'm Adem, Karabay Ilkay, Dost Gulseren, Ozgirgin Nese

From the 5. PMR Clinic, Ankara Physical Medicine and Rehabilitation Education and Research Hospital, references

Introduction. Our aim was to determine the developmental levels of children we had included in a rehabilitation program and to determine the difference between the calendar age and developmental age in addition to the effect of their developmental levels on motor function improvement **Materials and methods.** A total of 107 children with CP(Cerebral Palsy) who were accepted into a rehabilitation program as inpatients at our clinic were included in the study. We assessed whether there was a difference between the calendar age and the developmental age by the Denver II scale. The effect of the Denver II developmental levels on motor function was investigated. **Results.** We found a statistically significant difference between the developmental levels and calendar ages. There was also a statistically significant difference between the Denver II personal social, gross motor and fine motor levels. We found no difference only between personal social and language levels. The gross motor development was the most delayed value by calendar age. There was a statistically significant difference between the motor activity levels between admission and discharge as determined by

Gross Motor Functional Classification System and Gross Motor Function Measurement whatever the developmental level of the children with CP. **Conclusion.** The developmental ages of the children with CP were much lower than their calendar ages.

References

Frankenburg WK, Dodds J, et al. The Denver II: a major revision and restandardization of the Denver Developmental Screening Test. *Pediatrics* 1992;89:91-97.

Prevention of hip dislocation in cerebral palsy: early multilevel minimally-invasive approach (E.M.M.A.)

N. Portinaro, A. Panou and F.Pelillo

Department of Pediatric Orthopaedics and Neuro-orthopaedics surgery, University of Milan, Istituto Clinico Humanitas, Rozzano, Italy

Introduction. Hip problems in Cerebral Palsy are frequent (25-75%). Subluxation and dislocation of the hip is proportional to the neuromuscular involvement and is often due to the alterate spastic muscles forces acting on the femoral head in the acetabular cavity. E.M.M.A approach (Early Multilevel Minimally-invasive Approach) has been designed in 3 different steps and applied to decrease imbalanced forces due to spasticity acting on the femoral head and therefore to decrease hip migration progression, bone deformities and future pain with the minimal biological cost for the patients. We consider age and R.I. as crucial discriminants for treatment steps. All muscles around the hip joint are addressed simultaneously (adductor longus, ileopsoas, medial hamstrings and rectus femoris). **Materials and methods.** E.M.M.A. 1: age 2-4 years, RI $\leq 20\%$: multilevel injection of botulinum toxin in case of muscular hyperactivity without morphological alterations of the couple muscle-tendon (contractures). E.M.M.A 2: age 4-6, RI $\geq 20\%$: multilevel aponeurectomies in case of muscular hyperactivity with morphological alterations of the couple muscle-tendon (retraction). E.M.M.A. 3: AGE 6-8 E.M.M.A 2 associated to early bone surgery (proximal femoral temporary epiphysiorisis with cannulated screw to achieve a progressive correction of valgus deformity). We adopted this approach to prevent bone deformities with early mobilisation and early control of the pain in the same time. **Results.** In our department were treated 40 children with hip subluxation and a mean follow-up of 28 months. None of our patients have had a progression to reach hip dislocation. **Conclusion.** E.M.M.A seems to be a practical and little invasive approach to achieve hip containment, decrease spasticity and also appears to be satisfactory to prevent progressive acetabular dysplasia and hip dislocation.

References

D.D.S.H: developmental dysplasia of the spastic hip: strategies of management in cerebral palsy. A new suggestive algorithm. *Hip international* Vol.19 n°1 2009.

Clinical profiles of peripartum paralysis

Shaik Ahmed¹, Suzon Al Hasan¹, MA Shakoor², Maidul Islam³

¹Chittagong Medical College, Bangladesh

²BSMMU, Dhaka, Bangladesh

³DGHS, Bangladesh

Back ground. Pregnant women can present with a wide variety of neurological conditions. WHO has given top most priority in maternal and child health. There is little available medical literature to guide the physician in the care of the pregnant and postpartum patient who has paralysis. This study may help to determine socio-demographic status of the patients with peripartum paralysis, to identify existing disease burden and will assist to make plans to improve reproductive health. **Materials and materials.** This prospective observational study was conducted in the Department of Physical Medicine & Rehabilitation of Chittagong Medical College Hospital, Bangladesh, from 1st July 2008 to 31st June 2009. All the patients, referred to or attended in the department with the complaints of paralysis from last week of pregnancy to post partum period, were included in the study. Data were collected from a prepared check list and analysed with the help of SPSS version 15.0. The results were expressed as percentage and frequency. **Results.** Total 23 patients with peripartum paralysis were recorded during the study period. The age of the patients was from 17 to 45 years with the mean age of 27.48 ± 7.20 years. All were housewives and majority of them were rural (78.3%) and poor (60.9%). The onset of disease was within first week 60.8%, within second week 26.1%, beyond

second week 8.7% and prepartum 4.3%. The patients from 1st through 6th gravida were, 34.8%, 8.7%, 34.8%, 4.3%, 8.7%, and 8.7% respectively. Associated conditions were, pre-eclamptic toxemia (PET) 26.1%, hypertension (HTN) 8.7%, eclampsia 4.3%, lower segment Caesarian section (LSCS) 8.7%, and none 52.2%. Anaemia was found in 43.5% mild, 21.7% moderate and 4.3% severe. Oedema was present mildly in 47.8%, moderately in 8.7% and absent in 43.5%. Ambulation of the patients was paretic in 17.4%, on wheel chair 56.5% and on trolley 26.1%. Paralysed body parts were lower limbs 69.6%, all limbs 26.1%. Bladder function was normal in 73.9%, on catheter 13%, and dribbling incontinence 13%. Planter reflex was normal in all the patients. Reflexes of both knees were, absent 47.8%, weak 47.8%, and in ankles, absent 47.8%, weak 43.5%. Reflexes in the upper limbs, biceps and triceps were normal in majority of the patients and in significant number of patients it was impaired from weak to absent. Sensations were 78.3% intact. Muscle power of lower limbs, 8.7% grade 0/5, 13% grade 1/5, 21.7% grade 2/5, 47.8% grade 3/5, 8.7% grade 4/5 and none in grade 5/5. In the upper limbs, muscle power was none in grade 0/5 to 2/5, 21.7% grade 3/5, 17.4% grade 4/5 and 60.9% grade 5/5. Disability pattern was, walking 82.6%, standing 17.4%. FIM scores of self-care, sphincter control, transfer and locomotion were measured. Self-care, out of 42, minimum 9, maximum 21 and mean 16.30 ± 3.94 . Sphincter control out of 14, minimum 2, maximum 5, and mean 11.04 ± 5.09 . Transfer score, out of 21, minimum 3, maximum 9 and mean 6.00 ± 2.52 . Locomotion score, out of 14, minimum 2, maximum 5 and mean 3.43 ± 1.34 . Out of combined total FIM score 91, it was found minimum 16, maximum 49 and mean 36.70 ± 11.60 . **Conclusion.** From the present study, it may be concluded that the patients with peripartum paralysis may present with paralysis of all limbs but mainly in lower limbs. The study was done with the available patients attended in the department. There may be more patients suffering from diverse neurological disorders that were not referred to or attended in the department of rehabilitation. The clinical findings found in this study should further be evaluated with long term, multi-center and larger sample size.

Stress Fractures treated by ESWT

A. Notarnicola, L. Moretti, M.G. Maiorano, M. Forcignanò, S. Patella, L. Musci, B. Moretti
Orthopaedic Unit, University of Bari, Policlinico, Bari, Italy

Introduction. In soccer players, lower extremity stress fractures are common injuries and are the result of repetitive damage that exceeds the intrinsic ability of the bone to repair itself. They may be treated conservatively, but this may cause long-term complications, such as delayed union, muscle atrophy and chronic pain. Stress fractures that fail to respond to this management require surgical treatment, which is also not without risks and complications. Shock Wave Therapy has been used successfully on fracture complications, such as delayed union and non-union. Therefore, we want to examine ESWT in the management of stress fractures. **Materials and methods.** We present a retrospective study of 10 athletes affected by chronic stress fractures of the 5th metatarsus and tibia that received 3-4 sessions of low-middle energy ESWT. **Results.** At the follow-up, the clinical and radiographic results were excellent and enabled all players to gradually return to their sports activities. **Conclusion.** In the treatment of fractures, usually high energy is used to induce periosteal detachment and trabecular fractures with haemorrhages, which in turn stimulate callus formation and subsequent fracture healing. We chose to use lower energy ESWT on the rationale that ultrasound induces nitric oxide liberation at low energy. There is a link between NO and osteogenesis via the seven-day expression of the core binding factors cbfa1. Consequently, our application of lower energy shock waves stimulates bone growth by nitric oxide production. These reports show that ESWT is a non-invasive and effective treatment for resistant stress fractures in soccer players.

References

- Xu ZH, Jiang Q, Chen DY, Xiong J, Shi DQ, Yuan T, Zhu XL. Extracorporeal shock wave treatment in nonunions of long bone fractures. *Int Orthop* 2008 Apr; 25
- Taki M, Iwata O, Spiono M, Kimura M, Takagishi K Extracorporeal Shock Wave Therapy for Resistant Stress Fracture in Athletes. A Report of 5 Cases. *Am. J. Sports Med* 2007; 35; 1188- 1992.
- Moretti B, Notarnicola A, Garofalo R, Moretti L, Patella S, Marlinghaus E, Patella V. Shock waves in the treatment of stress fractures. *Ultrasound Med Biol.* 2009 Jun;35(6):1042-9.

Treatment of post-traumatic myositis ossificans by Extracorporeal Shockwaves Therapy

A. Notarnicola¹, S. Messina², P. Buselli³, V. Cocco⁴, R. Saggini⁵, F. Ciullo¹, L. Moretti¹, B. Moretti¹

¹Department of Clinical Methodology and Surgical Techniques, Orthopedics Section, Faculty of Medicine and Surgery of University of Bari, Bari, Italy

²Department of Physical Medicine and Rehabilitation, IRCCS Policlinico San Matteo, University of Pavia, Pavia, Italy

³Department of Spinal Unit, Hospital of Valtellina and Valchiavenna, Sondrio, Italy

⁴Physical Medicine and Rehabilitation Center, Acireale, Catania, Italy

⁵Department of Medicine and Science of Aging, G. D'Annunzio University of Chieti, Chieti, Italy

Introduction. Myositis Ossificans traumatica (MO) occurs after blunt trauma to muscle tissue. Patients experience tenderness and swelling at the site of injury and symptoms are generally unresponsive to one week of rest. The traditional therapeutic approach relies on a variety of treatments, such as physical therapy but evidence of their proven clinical efficacy is lacking. The aim of this clinical study is to assess the efficacy of extracorporeal shock wave therapy (ESWT) in the treatment of MO. **Materials and methods.** We illustrate a case series of 24 sportsmen with post-traumatic MO. After treatments with rest, ice, pharmacological therapies and daily physiotherapy, without any improvement, we administered three sessions of ESWT. Evaluations were made before treatment and 1, 2, 3, 6 and 12 months after treatment, and consisted of clinical and functional assessment and X-ray evaluation. **Results.** Only a partial reduction of the ossification was observed in the X-ray images but all the patients showed signs of functional improvement immediately after therapy. Two months after the therapy, a normal range of motion and no signs of weakness were observed. Three months after treatment, 87.5% of patients resumed regular sports activities. **Conclusion.** Our clinical findings demonstrate that ESWT treatment improved the trophism of the damaged muscle tissue and induced a statistically significant functional recovery. The results of the current clinical experience reveal that when ESWT were associated to physiotherapy, the management of MO became efficacy. Our results indicate that ESWT offer an interesting therapeutic opportunity for restoring the physiologic conditions of muscle extensibility in post-traumatic MO, associated to traditional rehabilitation.

References

- Kraus M, Reinhart E, Krause H, Reuther J. Low energy extracorporeal shockwave therapy (ESWT) for treatment of myogelosis of the masseter muscle. *Mund Kiefer Gesichtschir.* 1999 Jan;3(1):20-3.
- Manganotti P, Amelio E. Long-term effect of shock wave therapy on upper limb hypertonia in patients affected by stroke. *Stroke.* 2005 Sep;36(9):1967-71.
- Moretti B, Garofalo R, Genco S, Patella V, Mouhsine E. Medium-energy shock wave therapy in the treatment of rotator cuff calcifying tendinitis. *Knee Surg Sports Traumatol Arthrosc.* 2005 Jul;13(5):405-10.

Management of osteoarthritis and the significance of patient education

E. Ilieva

Medical University Hospital, Plovdiv, Bulgaria

Introduction. : The aim of the author is to present the knowledge about the prevention, management and rehabilitation of knee and hip osteoarthritis and the role of patient education. **Materials and methods.** The author makes review of the data from systematic reviews, meta-analyses of RCT and existing guidelines and presents evidence-based recommendations in the aspect of ICF. **Results.** The different interventions, including rehabilitation and the recommendations according to the grade of evidence are presented. One of the important rehabilitative interventions is education of the patients and self-management strategies. Evidences of metaanalysis of RCT prove the positive effect of patient education and self-management both in the early and late stage of the disease on pain and functional ability, thus reflecting activity and participation. Most of the recommendations include in the core treatment education, information access to enhance understanding of the condition and its management, including positive life-style change and adherence to physical activity. The core concepts involve engagement in self-care, improved self-monitoring, interactions with health-care professionals. Concerning joint replacement the evidence show that preoperative education has a modest beneficial effect on preoperative pain and anxiety and

should be targeted at those most in need of support. There is some evidence that it may positively impact the postoperative outcomes. **Conclusion.** The initial treatment of osteoarthritis should focus on patient empowerment and self-driven therapies and patients should receive education on life style changes, exercise and pacing of activities, which should be an ongoing integral part of the management plan.

References

1. Osborne R. et al. Patient education and self-management programs in arthritis. *MJA*, 2004; 180
2. Superio-Cabuslay E. Patient education interventions in osteoarthritis and rheumatoid arthritis: a meta-analytic comparison with nonsteroidal antiinflammatory drug treatment. *Arthr. And Rheum.* 2005, vol 9.
3. Mazzuca S. et al. Effects of selfcare education on the health status of inner-city patients with OA of the knee. *Athr. And Rheum.* 2005,

Italian multicenter data collection on Intrathecal Baclofen for Spinal Cord Injury (SCI): preliminary results till to 12 months follow-up visit

M. Menarini¹, V. Filipello², A. Massone³, M. Cazzaniga⁴, B. Lanzillo⁵, M.P. Onesta⁶, G. Stampacchia⁷, R. Quatrone⁸, S. Petrozzino⁹, S. Aito¹⁰, G. Bertagnoni¹¹, on behalf of Italian Spinal Cord Injury Board

¹Unità Spinale, Montecatone Rehabilitation Institute, Imola (BO)

²Unità Spinale Unipolare, Torino

³Ospedale Santa Corona, Pietra Ligure (SV)

⁴Villa Beretta, Costa Masnaga (LC)

⁵Fondazione Maugeri Telese Terme, Telese (BN)

⁶Ospedale Cannizzaro, Catania

⁷A.O. Universitaria Pisa, Pisa

⁸Arcispedale S.Anna, Ferrara

⁹Ospedale SS Antonio Biagio e Cesare Arrigo, Alessandria

¹⁰Unità Spinale Unipolare, Firenze

¹¹Ospedale S.Bortolo, Vicenza

Introduction. Intrathecal Baclofen (ITB) therapy is safe and effective in management of severe spasticity [1]. Our ongoing data collection is aimed to evaluate ITB treatment effects on patients affected by Spinal Cord Injury (SCI). **Materials and methods.** 96 patients (84 males, 12 females, mean age: 38.9 years) with SCI were evaluated from February 2007 to November 2009: data were recorded at the baseline and every 6 months after implant. Patients were both tetraplegic (34) and paraplegic (54), 96% used oral antispastics. **Results.** 94 patients performed an ITB trial test, 81 responded positively and 78 underwent the pump implantation. 55 patients had a follow-up visit after 6 months (6mFU) and 40 after 12 months (12mFU). At 12mFU, the mean Ashworth scale score decreased in tetraplegic patients from 2.09 to 1.88 and from 3.39 to 2.07 for upper and lower limbs respectively, while in paraplegic patients a higher reduction from 3 to 0.5 was recorded (p<0.001). The average spasm score decreased from 2.9 to 1.71 at 6mFU and to 1.62 at 12mFU (p<0.001). The mean SCIM score also significantly improved, from 47.6 to 54.1 at 12mFU (p=0.028). The primary outcome defined by the physicians (e.g. Improvement of ADL: 20%, reduction of contractions: 19%) was totally and partially achieved at 12mFU for 78% and 6% of patients respectively. A total number of 36 adverse events occurred and in 2 cases the device was removed. **Conclusion.** Collected data supports the efficacy of ITB therapy on the treatment of spasticity in patients affected by SCI. Further information will be provided with future acquisitions clarifying the long-term therapy effects.

References

1. Ordia JL. et al. Continuous Intrathecal Baclofen Infusion by a Programmable Pump in 131 Consecutive Patients with Severe Spasticity of Spinal Origin, *Neuromodulation*, Volume 5, Number 1, 2002 16-24.

Severe acquired brain injury in Italy: data from the experimental national register

M. Khansefid¹, R. Avesani¹, P. Boldrini², M. Zampolini³, M. Fedeli⁴, A. De Tanti⁵

¹Sacro Cuore Don Calabria Hospital Negrar-Verona

²Rehabilitation Department Treviso Hospital

³Rehabilitation Department Trevi Hospital (Perugia)

⁴Ircss S.Camillo Venezia

⁵Rehabilitation Unit Cardinal Ferrari Hospital Fontanellato

Introduction. In Italy the lack of information on incidence, severity and courses of subjects with brain injury has highlighted the

need of a countrywide database. In June 2008, an on-line register was developed to connect rehabilitation centres for severe acquired brain injury (ABI). **Materials and methods.** 28 rehabilitation centres have participated with a total number of 966 patients with both traumatic (TBI) and non traumatic brain injury (NTBI). All subjects were at their first rehabilitative admission and came directly from acute wards. Data collected included aetiopathogenesis of cerebral injury, demographic characteristics, indicators of burden of care, such as the presence of tracheotomy tube, and length of acute and rehabilitative stay. Level of initial and final disability was measured by the Disability Rating Scale (DRS). **Results.** 45% of patients had suffered a TBI, 37% a severe vascular insult, 10% anoxic and 6% infective or tumoural cerebral damage. Mean age of subjects with TBI and NTBI was 40,56 and 56 respectively. Traumatic patients presented with mean admission and discharge DRS scores of 16,6 and 10 while non traumatic subjects' average scores were 18,7 and 14,8. 30% of patients were in a vegetative state at the beginning of rehabilitation course, of these 5% showed a good recovery in terms of DRS score. After an average length of rehabilitative stay of 117 days, 47% of subjects with TBI returned home in opposition to 30,4% of those with NTBI. **Conclusion.** First data from the Italian register show a prevalence of non traumatic aetiologies, progressive ageing of population at time of injury and increasing case complexity. Systematically use of the DRS permits a more comprehensive analysis, a better planning of rehabilitation pathways and prediction of outcome.

References

1. Avesani R.,P.Boldrini, et al 2003. "Rehabilitation of sever brain injury in Italy, the GISCAR study", *Neurological Sciences* 24 (supplement October 2003): S 796-S799. www.glca.it.

Special characteristics of prosthetic rehabilitation of a polytraumatized patient - case study

I. Simanic, M. Teofilovski, I. Popovic, V. Ristic, M. Tomic, B. Vidakovic-Maksimovic

Specialized hospital for rehabilitation and orthopedic prosthetics, Belgrade, Serbia

Introduction. The issue of the orthotic-prosthetic care of patients after polytrauma with amputations is a complex modality of rehabilitation. **Materials and methods.** Case study. **Results.** The patient M.D., a male aged 32, suffered following injuries in a traffic accident on January 28, 2006: a complicated left femur fracture, an injury of a right knee-joint, a left below-elbow fracture, thoracic contusion and the injury of magistral vessels in the left leg. He was primarily hospitalized in a Medical Center "Kraljevo" and then transferred to the orthopedic department of the Urgent Care Center in Belgrade in a state of a hemorrhagic shock. The following surgical procedures were performed: Repos. Orth. Fixat ext. genus dex. Et femoris sin., by-pass poplitealis L.sin cum graft. Autovenosum, ligatura v. popliteae sin, frasciotomia cruris sun. bill I amputatio femoris I.sin. Preprosthetic preparation was followed by the application of the first above-knee endoskeletal prosthesis and the gait training. He was prescribed a peroneal orthosis for his paretic right foot. Due to osteomyelitis which affected his right leg, the patient was transferred to the Orthopedic department of the Clinical Center for surgical treatment, after which he was returned to our hospital for continuing his started prosthetic rehabilitation. Because of the involution of the stump soft tissues and the development of a large osteophyte on a distal femoral segment, it was necessary to apply a new socket. **Conclusion.** The patient learned to walk with a prosthesis and a peroneal orthosis with the help of underarm crutches on level or uneven grounds, which corresponds to grade IV of the functional level of activity.

References

- Marković Z et all:Protocol prosthetic rehabilitation at person with lower limb amputation 4 th East Europe ISPO conferecy, Belgrade, 2005; *Atlas of Limb Prosthetic: St Louis Mosby-Year Book* 2004, 503-517.

Heterotopic ossification following cardiac arrest and hypoxic brain damage

????

?????

Background. Heterotopic ossification is the formation of osseous masses in the soft tissues where it does not normally occur. It can

cause severe stiffness of joints. The aetiology may be posttraumatic, neurogenic or genetic. **Objectives.** We aim to assess the development of heterotopic ossification in patients who suffer hypoxic brain injury, and look at the impact on the rehabilitation process. **Materials and methods.** We identified 39 patients who developed hypoxic brain injury after cardiac arrest. We assessed the conscious level, spasticity and joint stiffness. We diagnosed those who developed heterotopic calcification using clinical examination, blood markers and X-ray imaging. Those who had X-ray findings of heterotopic calcification were further assessed by CT scan. **Results.** In 39 patients, 6 developed heterotopic calcification (15%). The cause of cardiac arrest varied. We found that in those patients with heterotopic calcification, there was increased pain at the site, with increased stiffness of the joint involved. The commonest joints involved were the hip, elbow and shoulder. 3 patients had multiple joints involved. **Conclusions.** Heterotopic ossification can occur in up to 15% of patients following hypoxic brain injury. It can lead to increased pain in joints on movement and can prolong the rehabilitation process of the patient

Authors

Magdalena Mackiewicz-Milewska	Department of Rehabilitation CM UMK Bydgoszcz Poland	magmami@onet.eu
Stanislaw Jung	Department of Trauma and Orthopaedics, South South Tyneside District Hospital, South Shields, UK	srook@hotmail.co.uk
Steve Borland	Department of Trauma and Orthopaedics, South South Tyneside District Hospital, South Shields, UK	stev90210@yahoo.co.uk
Sabina Lach-Inszczyk	Department of Rehabilitation CM UMK Bydgoszcz Poland	sabinalach-inszczyk@wp.pl
Iwona Szymku	Department of Rehabilitation CM UMK Bydgoszcz Poland	i.w.o.n@interia.pl
Jakub Cieciński	Dept of Radiology and Diagnostic Imaging CM UMK Bydgoszcz, Poland	kizradiol@cm.umk.pl
Małgorzata Cisowska-Adamiak	Department of Rehabilitation CM UMK Bydgoszcz Poland	virion@poczta.wp.pl
Wojciech Hagner	Department of Rehabilitation CM UMK Bydgoszcz Poland	klreh@cm.umk.pl
Waldemar Lasek	Dept of Radiology and Diagnostic Imaging CM UMK Bydgoszcz, Poland	kizradiol@cm.umk.pl

Presenting and principle author

Magdalena Mackiewicz-Milewska	Department of Rehabilitation CM UMK Bydgoszcz Poland	magmami@onet.eu
-------------------------------	--	-----------------

Predictors of outcome in post-injury brain: Coma Recovery Scale-Revised (CRS-R) is a reliable tool to monitor disorders of consciousness and to predict clinical outcomes

M. Ebreo, M. Firera, G.Di Iasi, M.Storti, P. trovato, E. Mili, A Delli Gatti, S. Capomolla

Unità Gravi cerebrolesioni acquisite, Polo Specialistico Riabilitativo, Fondazione Don Carlo Gnocchi ONLUS, Sant'Angelo dei Lombardi.

Introduction. Coma Recovery Scale-Revised (CRS-R) is a reliable tool to distinguish patients in the minimally conscious state from those in a vegetative state. The CRS-R was composed of 29 hierarchically organized items divided into 6 subscales addressing auditory, visual, motor, oromotor, communication, and arousal processes. The scale has been validated for mid-term but not for long-term functional outcome. **PURPOSE:** To examine whether the baseline and changes during follow up of the CRS-R are associated with clinical outcomes in patients in vegetative state following severe brain injury. **Materials and methods.** We performed a prospective observational cohort study of all patients with vegetative state due to brain injury admitted to the Intensive Rehabilitation Unit of Sant'

Angelo dei Lombardi Don Gnocchi Foundation in the period January 2007 to December 2009. Data collected included demographics , brain injury etiology, length of stay in intensive care unit and vital signs. The CRS-R scale was assessed weekly for 3 months. The weekly change in CRS-R was also calculated. For the purpose of this study, we evaluated the clinical state of the patients after six months. Clinical states were defined as regaining consciousness (RC), the minimum consciousness state (MCS) or a persistent vegetative state(VS). We conducted a 2-way analysis of variance(ANOVA) of continuous variables to evaluate the group interactions; Multiple linear regression analysis was performed to examine the association between independent variables and clinical outcomes. **Results.** 49 patients (M/F: 30/14; years 57±16) with an initial vegetative state due to severe brain injury were evaluated. 29 patients regain of consciousness, 5 patients acquired minimum consciousness state and finally 15 patients remained in vegetative state. The time for regaining consciousness was 5±3 weeks. CRS-r score stratified patients for the degrees of regain of consciousness state (RC 19±2,7§ MCS 13±2,4* - VS 5,8±2,0 - *p<0.0001 vs vegetative state § p< 0001 vs MCS.). The temporal changes of the CRS-r were accurate identifying of patients with a state of emergency of the state of consciousness to those that remained in a vegetative state (7±5* vs 2,5±2,0 *p<0.0001). Of the variables used in the regression analysis only changes to the CRS-r score obtained in weeks 1, 4 and 8 predicted the clinical outcome at 6 six months post injury (R² .62 - F7,79 p<0.0001). **Conclusion.** these results highlight the heterogeneity in outcome following severe brain injuries. The CRS-R is a reliable tool that can identify patients in various states of consciousness. Furthermore changes to the CSR-R during intensive treatment are associated with clinical outcomes in these patients. These results provide useful information for treatment planning in the intensive rehabilitation Unit.

References

Reliability and Diagnostic Characteristics of the JFK Coma Recovery Scale-Revised: Exploring the Influence of Rater's Level of Experience. Løvstad M, Psychol C, Frøslie KF, Scient C, Giacino JT, Skandsen T, Anke A, Schanke AK. J Head Trauma Rehabil. 2010 Feb 4.

Heterotopic ossifications in severe brain injury: a prospective study

P. trovato, G.Di Iasi, M.Storti, G. Storti, Luigi Metallo, M. Colella, C. Ioanna, A Delli Gatti, S. Brancaccio, S. Capomolla

Unità Gravi cerebrolesioni acquisite, Polo Specialistico Riabilitativo, Fondazione Don Carlo Gnocchi ONLUS, Sant'Angelo dei Lombardi

Introduction. Heterotopic ossification(HO) in patients with brain injury is a frequent complication. The clinical spectrum of HO ranges from an incidental finding on X-rays to severe functional limitations. The incidence of HO ranges from 11% to 76% depending on the population, methods of diagnosis and study performed. **PURPOSE.** Many factors are involved in the genesis of HO and their role remains controversial. This prospective study evaluated the incidence of HO and analyzed the relation between demographic, clinical ,functional factors and HO in patients with severe brain injury. **Materials and methods.** We performed a prospective observational cohort study of all patients with severe brain injury admitted to Severe brain injury rehabilitation Unit of Sant' Angelo dei Lombardi Don Gnocchi Foundation from januar 2007 through December 2009. Patients performed at admission X-rays to evaluated HO. Data collected included demographics, brain injury etiology, length of stay(LOS) in intensive care Unit, vital signs and infections. Biochemical (serum concentrations of sodium, potassium, urea, creatinine, aspartate transaminase, glutamate transaminase, bilirubin serum, alkaline phosphatase, albumin) and hematologic parameters (hemoglobin concentration, white cell and platelet counts) were measured. Functional outcome was assessed by barthel index scale. We conducted 2-way analysis of variance(ANOVA) of continuous variables and chi square test for categorical variables to assess differences according to HO; Multiple linear regression analysis was performed to examine the association between independent variables and HO. **Results.** 154 patients (M/F: 102/52 ; years 59±17) with severe brain injury were evaluated. Heterotopic ossification have been found in 24/154(18%) of patients. The eterotopic ossifications were significantly more frequent in patients with severe brain injury due to anoxia (39%) rather than due to trauma(17%) or vascular causes(14%). Patients with HO had values of haemoglobin (8,7±2,5 g/dl vs 10.1±3, g/dl p<0.02) and albumin (2,4±1 g/dl vs 2,91±,64 p<0.01) significantly lower than in patients without exuberant bone formation. In addition, the patients with HO had a heart

rate (96 ± 13 bpm vs 82 ± 14 bpm $p < 0.001$), spasticity (29% vs 12% $p < 0.04$ and a length of hospitalization in intensive therapy (45 ± 24 vs 36 ± 26 days $p < 0.02$) significantly more than in patients without HO. Between the variables used in regression analysis Etiology, LOS UCI, spasticity, Heart rate, predicted the appearance of heterotopic ossification in Intensive rehabilitation Unit ($R^2 = .75 - F9 p < 0.0001$). Patients with heterotopic ossification have experienced a greater length of hospitalization (138 ± 85 vs 92 ± 89 day $p < 0.002$) and less functional recovery (Barthel index changes: 19 ± 34 vs 37 ± 35 $p < 0.001$) compared to patients without. **Conclusion.** heterotopic ossification are frequent complication in patients with severe brain injury. These abnormalities are significantly associated with a prolonged ioxia conditions (etiology and anemia) metabolic, functional alterations and disease management during intensive care. These results provide useful information for treatment planning in the intensive rehabilitation Unit.

References

- Heterotopic ossification following traumatic brain injury and spinal cord injury. Cipriano CA, Pill SG, Keenan MA. *J Am Acad Orthop Surg.* 2009 Nov;17(11):689-97.
- Serum-mediated osteogenic effect in traumatic brain-injured patients. Gautschi OP, Cadosch D, Frey SP, Skirving AP, Filgueira L, Zellweger R. *ANZ J Surg.* 2009 Jun;79(6):449-55.
- Neurorehabilitation in traumatic brain injury: does it make a difference? Greenwald BD, Rigg JL. *Mt Sinai J Med.* 2009 Apr;76(2):182-9.

Outcome of intensive rehabilitation program in patients with severe brain injury

G. Di Iasi, M. Storti, P. trovato, A. Delli Gatti, G. Storti, L. Metallo, C. Ioanna, M. Colella, A. Delli Gatti, S. Brancaccio, S. Capomolla
Unità Gravi cerebrolesioni acquisite, Polo Specialistico Riabilitativo, Fondazione Don Carlo Gnocchi ONLUS, Sant'Angelo dei Lombardi.

Introduction. Severe brain injury is a growing public health problem. The incidence and prevalence of brain injury secondary to trauma or cardiovascular causes are clearly increasing in industrialized countries. This dramatic health care burden has made it necessary to define the continuity of the process of care as a homogeneous route coherent with the phases of the illness and one governed by an integrated system of several strategies of different intensity. These management strategies can be supported by integration of several competence. Recent data point out how comprehensive management strategies can improve outcomes in brain injury and thus make resource consumption more effective. **Objective.** To evaluate the outcome of comprehensive intensive rehabilitation program in Severe brain injury rehabilitation Unit. **Materials and methods.** We performed a prospective observational cohort study of all patients with severe brain injury admitted to Severe brain injury rehabilitation Unit of Sant' Angelo dei Lombardi Don Gnocchi Foundation from January, 2007, through December 2009. Data collected included demographics, brain injury etiology, length of stay (LOS) in intensive care Unit, vital signs and infections. Biochemical (serum concentrations of sodium, potassium, urea, creatinine, aspartate transaminase, glutamate transaminase, bilirubin serum, alkaline phosphates, albumin), hematological parameters and devices were measured during management. Functional outcome was measured by Glasgow Coma scale (GCS) and Barthel index scale. We conducted 2-way analysis of variance (ANOVA) of continuous variables and chi square test for categorical variables to assess differences according to management phases. Logistic regression analysis was performed to examine the association between variables and inpatients mortality. **Results.** 154 patients (M/F: 102/52; years 59 ± 17) with severe brain injury were evaluated. This disorder was caused by anoxia (24 pts (15%)), trauma (32 pts (21%)) and vascular incident (98 pts (64%)). 34/154 (22%) of patients died during intensive rehabilitation. During the stay in hospital the patients have experienced a significant clinical (hemoglobin g/dl: in 9.4 ± 2.8 vs 10.6 ± 3.3 out $p < 0.006$ - Albumin g/dl: in 2.6 ± 0.8 vs 3.1 ± 0.9 out $p < 0.0001$ - Heart rate (bpm): in 94 ± 15 vs 85 ± 15 out) and functional (GCS: in 9 ± 3 vs 12 ± 4 out $p < 0.0001$ - Barthel index: in 3.5 ± 11 vs 29 ± 39 out $p < 0.0001$) improvement. 115/154 (75%) patients experienced 213 infection episodes which required 3470 days of antibiotics treatment (22 ± 23 days/pts). The emergency management was performed in 75/154 (48%) of patients. Of the variables used in the logistic regression analysis device number - OR 3 (1-10) $p < 0.002$ - serum albumin level - OR 0,1(0,1-0,7) $p < 0.01$, Glasgow Coma Scale -OR 0,59(0,39-0,59) $p < 0.0001$ and infections number -OR 3(1-7) $p < 0.0001$ are related with inpatients mortality. **Conclusion.** These results highlight the multidisciplinary management required for these

patients in the Intensive rehabilitation Unit. The rehabilitative program can be modified the clinical natural history. The degree of consciousness, metabolic state, device supports and infections are related hard events. These results provide useful information for treatment planning in the intensive rehabilitation Unit.

References

- Diagnosing dysautonomia after acute traumatic brain injury: evidence for over-responsiveness to afferent stimuli. Baguley IJ, Nott MT, Sleva-Younan S, Heriseanu RE, Perkes IE. *Arch Phys Med Rehabil.* 2009 Apr;90(4):580-6.
- Evidence for the effectiveness of multi-disciplinary rehabilitation following acquired brain injury: a synthesis of two systematic approaches. Turner-Stokes LJ. *Rehabil Med.* 2008 Oct;40(9):691-701.
- Does long-term outcome after intensive inpatient rehabilitation of acquired brain injury depend on etiology? Blicher JU, Nielsen JF. *NeuroRehabilitation.* 2008;23(2):175-83.

The computer records of the department of rehabilitation

G. Quattrocchi, A. Consalvi, S. Sorce, P. Mandalari, V. Santamaria, S. Rosina, A. De Leo, G. De Luca, S. Colavita, G. Gazzara, G. Cilia, V. Nastasi, R. Trifirò, N. Fazio

Department of Rehabilitation ASP Messina

Introduction. In 2009, the Department of Rehabilitation ASP Messina, has laid the groundwork for the computerization of its management processes, clinical and administrative. **Objectives** are 1. Use of a database fast, reliable and economical management of clinical and administrative functions; 2. Realization of user interface as intuitive as possible (user-friendly); 3. Software maintenance easier and faster, using remote assistance; 4. Assurance data security and compliance with Law 196/2003 on Privacy. **Materials and methods.** For achieving the first objective you have chosen MySQL, a relational database management system consists of a client and a server, both available for both UNIX Advantages of MySQL are speed and reliability, the fact that it has become a standard worldwide and its totally FREE. For the user interface has opted for a simple solution. Were chosen interfaces known as the most common browsers: Microsoft Internet Explorer, Opera, Mozilla Firefox ... To do what was necessary for the adoption of software development tools for web with three significant results: the software is automatically can also be used with handheld devices, requires no installation, can be enjoyed anywhere in the world. **Results.** The software created, therefore, shows the status of a common website, the beautiful graphics and intuitive, navigable by the user with simple clicks. **Conclusion.** Users of this software are on staff at the Department, including facilities outside agreements, taking over the patient authorized to communicate telematic data on admissions and treatment in progress.

References

- Rustici A. La Cartella Clinica informatica: F. Soldi, Cremona 22.03.2003
- Perelli Ercolini M. Gli aspetti fondamentali della cartella clinica Ist. F. Soldi, Cr. 22.03.2003.
- Tamburini P., Fagioli G. - Il medico e la privacy. Ed. FAG, 2000.

Draft centralized service for prescription prosthetic and orthotic aids

G. Quattrocchi, V. Santamaria, A. Consalvi, P. Mandalari, S. Rosina, A. De Leo, G. De Luca, S. Colavita, G. Gazzara, G. Cilia, V. Nastasi, R. Trifirò, N. Fazio

Department of Rehabilitation ASP Messina

It is proposed to create a centralized service (SCPOA) with the aim of optimizing resources with positive impacts on appropriateness of prescription, killing of waiting times, avoidance of benefits not due. The Sicilian Region has identified the boundaries of health units with the provincial areas. In our situation the boundary is identified with the limits of the province of Messina, a territory administered through nine districts. A vast and complex reality where they interact, for the part of our interest, ten structures character hospital, a polyclinic facilities poliambulatoriali district, ADI, rehabilitation centers for art. 26 L. 833/78, clinics FKT, RSA, special discounts. The prescription is written by specialists on the NHS responsible for type of impairment or disability. The prescription of prosthetic care is an integral part of a program of prevention, treatment and rehabilitation of injuries or their outcomes individually, the competition or coexistence, determine an impairment or disability ... art. 4 paragraph 3 Ministerial Decree 27/08/1999 No 332. It is believed that the

wide range of specialists with skills prescriptive without coordination, may lead to the patient that is relevant critical optimization of resources. Discuss the cases. 1. User for whom there is an ongoing rehabilitation treatment. Specialist and rehabilitation team treating the patient who takes responsibility for the treatment at every stage including the use of an assist from Tariff Nomenclature. 2 User Interface with the offices that authorize the provision of prostheses for the garrison, in the absence of evaluation and development of Rehabilitation of every consideration. As the decree 332/99, which governs the limitation, any requirement can not disregard the need to require a garrison in a functional reason for rehabilitative attention. It proposes the establishment of a centralized service to the deputy handling of prescriptive organizing a central Departmental requirements that would address the receipt of any application submitted by individual districts VIA INTERNET The service will later verify the concurrent development of plans for rehabilitation treatment already being developed through the verification of permits issued in the individual districts and assisted in verification of treatment at rehabilitation centers or other facilities assigns.

References

- D.A. 332/99
- art. 26 L. 833/78
- art. 4 comma 3 D.M. 27/08/1999 n. 332

Case report: eosinophilic fasciitis

L.C. Garrote-Moreno, E. Pellicer-Fernández, M.J. Llópez-García, C. Corrochano-García, E.G. Bataller-Peñafie, E.A. Sevilla-Hernández, M.A. Moreno-Carrillo

Physical Medicine and Rehabilitation Unit. Morales Meseguer Hospital. Murcia. Spain.

Introduction. Eosinophilic fasciitis (EF) (Shulman's syndrome, diffuse fasciitis with eosinophilia) is a disease characterized by the sudden onset of painful swelling with induration of the soft tissues and peripheral eosinophilia, and other symptoms (elevated erythrocyte sedimentation rate (ESR), hypergammaglobulinemia and high levels of circulating immune complexes). Etiology is unknown. It is usually seen in middle-aged adults. It rapidly progresses to joint contractures because of inflammation and fibrosis of the fascia. It is usually chronic but spontaneous remission is possible. Standard therapy includes corticosteroids and immunosuppressive drugs. **Materials and methods.** Descriptive and retrospective analysis of a clinical case of eosinophilic fasciitis. **Results.** A 59-year-old woman suffering from progressive tightness and induration of the skin over forearms and legs during 3 months. Laboratory results: eosinophils-29%, ESR-18mm/hr (normal 0-10mm/hr); antinuclear antibodies (ANA)-negative. Incisional skin biopsy confirmed the diagnosis of EF and patient was treated with prednisolone daily and methotrexate once a week. In a few weeks, she developed swelling of the extremities and joint contractures, leading to impaired mobility (shoulders, elbows, knees...) without neurological alterations. She started physical therapy: stretching and isometric exercises. She experienced marked changes in skin softening and limb mobility in four weeks. **Conclusion.** Physical therapy constitutes an essential aspect in management of fasciitis preventing joints limitations and disability.

References

- 1. Jankelevich A. Fasciitis eosinofílica: Reporte de un caso en paciente minero. Revista ANACEM 2009;3(2):55-57.
- 2. Godoy-Romero A. Fasciitis eosinofílica asociada a traumatismo simple. Rev Med Hond 2001;69:153-156.
- 3. Joassin R. Functional assessment and rehabilitation of EF. Ann Readapt Med Phys 2006Nov;49:577-80
- 4. O'laughlin TJ. Rehabilitation of EF. A case report. Am J Phys Med Rehabil 1994Jul-Aug;73:286-92
- 5. Wollheim FA. EF complicated by carpal tunnel syndrome. J Rheumatol 1981Sep-Oct;8:856-60
- 6. Al-Ghamdi K. EF (shulman's syndrome): case reports and review of the literature. Annals of Saudi Medicine 2001;21:68-72.

Use of the surface emg in the rehabilitation of the peripheral neurolesion of facial nerve

G.Reggiani, C. Cazzola, I. Miselli, M.Vanini

Department Of Rehabilitation Medicine, Carpi (Modena) Ausl Of Modena

Background. The anatomic and functional geometry of the face is severely compromised in the peripheral neurolesion of facial

nerve due to the reduction of the muscle tone. The resulting asymmetry constitutes a real physical-psychological-social disability. **Aims.** The purpose of this study is to use the surface EMG as an indicator of objective evaluation and rehabilitative prognosis, by measuring the timing of activation in the three branches of the facial nerve. **Materials and methods.** Seven patients, 5 women and 2 men, 22-61 years-old, suffering from paralysis of the peripheral facial nerve after parotidectomy (5 patients) or Bell's palsy (2 patients) were admitted to our department and received full evaluation: anamnesis, functional study of the facial nerve (according to the House Scale of 6 degrees), surface EMG at rest and during voluntary contraction. All patients underwent a rehabilitation treatment which included: anatomy-functional touch massotherapy, functional bandages, linfotaping, Kabat technique, training for self-treatment of facial expressions and counseling of behavioral health. **Results.** In the pre-treatment phase, patients assessed by the House Scale-B were distributed as follow: 3 in grade III, 3 in grade V, 1 in grade IV. In the post-treatment phase 4 patients were in grade I and 3 were in grade II. **Conclusion.** The goals of our rehabilitation program is to restore the anatomical shape of the face controlling the syncinesis. The conservation of these geometries is crucial because the combination of muscle tension-length regulates motor control. The use of elastic bandage, which stimulates with selective and intensive modality the injured muscle, is advantageous compared to conventional techniques because it does not induce spasms which are often irreversible.

References

- 1. Salinas RA, Alvarez G, Ferreira J. Corticosteroids for Bell's Palsy (Idiopathicfacial Paralysis). Cochrane Database Syst Rev 2004; CD001942
- 2. House JW, Berkmann DE. Facial nerve grading system. Otolaryngol Headsurg 1985;93:146-7
- 3. Grogan PM, Gronset GS. Practice Parameter: steroids, Acyclovir and surgery for Bell's Palsy (an evidence-based review): Report of the quality standards subcommittee of the American Academy of Neurology. Neurology 2001;56:830-6.
- 4. Pape ID. Rehabilitation of the paralyzed face. Otolaryngol Clin North A M : 727-38, 1991.

Manual therapy versus mesotherapy in treatment of chronic neck pain

C. Costantino, S. Bertuletti, S. Minnella, E. Marangio

Physical and Rehabilitation Medicine Postgraduated School , University of Parma

Introduction. The aim of this study is to verify, in patients with chronic neck pain, the effectiveness of vertebral manipulation associated with specific exercises compared to mesotherapy with the same exercises. **Materials and methods.** We have selected 21 patients aged between 20 and 75 years with chronic neck pain and we have randomized in two groups: first group treated with manipulation (10 patients), second group treated with mesotherapy (11 patients). All patients were evaluated with VAS , Northwick Park Neck Pain Questionnaire (NPQ) and CSQ-8 Questionnaire at the beginning, at the end of the treatments and after 3 months follow up. **Results.** We demonstrated a statistically significant difference between NPQ e VAS values measured at the beginning and at the end of the treatment in the manipulation group (pNPQ=0.002, pVAS=0.000) and in the mesotherapy group (pNPQ=0.000, pVAS=0.001). No statistically significant difference was showed comparing both groups at the end of treatment. Furthermore we demonstrated the outcomes maintenance in both groups comparing NPQ and VAS at the end of treatment and at the follow-up (I group: NPQ=0.427, VAS=0.566); (II group: NPQ=0.411, VAS=0.573) **Conclusion.** We found no significant difference, as regard efficacy, between the two treatments. We will verify our results with a larger group of patients and a longer period of follow up.

References

- Groeneweg R, Kropman H, Leopold H, van Assen L, Mulder J, van Tulder MW, Oostendorp RA. The effectiveness and cost-evaluation of manual therapy and physical therapy in patients with sub-acute and chronic non specific neck pain. Rationale and design of a Randomized Controlled Trial (RCT). BMC Musculoskelet Disord. 2010 Jan 24;11:14.
- Gross A, Miller J, D'Sylva J, Burnie SJ, Goldsmith CH, Graham N, Haines T, Bronfort G, Hoving JL. Manipulation or mobilisation for neck pain. Cochrane Database Syst Rev. 2010 Jan 20;(1):CD004249.

Impact of expiratory muscle weakness and ineffective cough on the decannulation protocols in Severe Acquired Brain Injury patients. Protocol study about the use of Inexsufflator in SABI patients with tracheostomy

J.N. Solano¹, F. Colonna¹, C. Lanzilotti¹, N. Resta¹, R. Cicero¹, S. Anglani¹, V. Tagliente¹, G. Megna²

¹Fondazione San Raffaele Rehabilitation Center, Ceglie Messapica (Brindisi)

²University of Bari

Introduction. Severe Acquired Brain Injury (SABI) patients show asymmetry of ventilation, reduced excursion of the diaphragm and the chest wall, and reduced cough peak flow rates, consistent with respiratory muscle weakness. Absent or weak cough has been associated with higher incidence of aspiration and chest infections in stroke patients and is one of the most important determinants on the decannulation decision. Inexsufflator has been shown to be effective in assisting cough in individuals with spinal cord injury and neuromuscular diseases. **Materials and methods.** We have made a systematic review to analyse the impact of the expiratory muscle weakness and ineffective cough on the decannulation protocols and cough assist techniques used in SABI patients. **Results.** There has been an increase in the number of papers in the literature regarding tracheostomy practices (timing and procedure). However, there is limited scientific evidence in the literature specifically concerning decannulation processes. There are not studies about the effectiveness of mechanical cough assist in the SABI patients. **Conclusion.** We design a protocol study of a randomised, controlled trial about the effectiveness of Inexsufflator in the tracheostomy SABI patients with expiratory muscle dysfunction and weak cough.

A SEMG FRP analysis & 3-d skeleton model for neck and low back pain functional assesment

M. D'Amico^{1,2}; F. Ciarrocca¹, M. Panicia¹; P. Roncoletta², M. Tomassini¹, M. Vallasciani¹

¹L.A.M.P.O. (Laboratorio Analisi del Movimento e Postura) Istituto di Riabilitazione S.Stefano, Porto Potenza Picena (MC) Italy

²Bioengineering & Biomedicine Company Ltd, San Giovanni

Introduction. In spine pain related pathologies is of major importance the evaluation of functional limitations associated. This requires to integrate morphological characteristics with information deriving from other measurements devices as force platform data and surface EMG. The aim of this study is to present a multi-factorial approach which integrates rachis morphological characteristics with full skeleton kinematic, dynamic and SEMG measurements to quantify spine function and mobility in particular for neck and low back pain. **Materials and methods.** Posture and Movement/Gait analysis are performed by 3D Opto-electronic stereophotogrammetric measurements of body landmarks labelled by passive markers [1]. The model can be scaled to fit the subject's skeleton by using different acquisition protocols involving assorted body labeling, providing subject's anthropometric measurements. The model is able to fully integrate forces from force platforms. SEMG muscle activities are recorded to investigate motor co-ordination/dysfunction as well as the presence/absence of flexion-relaxation phenomena (FRP) associated to pain [2]. Static posture is first evaluated, then, patient is asked to perform specific motion test batteries to measure the whole spine ROMs in Axial rotations, forward-backward flexion-extension, lateral bendings. **Results.** Test results highlights pathological functional behaviour w.r.t. the healthy one showing a noticeably smaller range of spinal angles and a different pattern due to different strategies in task execution. SEMG in the healthy subjects shows the presence of FRP, while in LBP subjects with altered spine movement patterns a full muscles block is shown, confirming associated pain or functional limitation condition. **Conclusion.** Quantitative functional evaluation represents one main goal to achieve in LBP. Optoelectronic associated to multi-sensor measurement approach appears to be a potentially significant solution to complete the necessary functional information.

References

1. M. D'Amico et al., A 3-D Biomechanical Skeleton Model And Processing Procedure For Posture And Movement Analysis, Eur. Med. Phys. 2007:43 (Suppl. 1)
2. <http://www.seniarm.org>

A multifactorial 3-d biomechanical skeleton model approach for posture and movement analysis: a 15 years activity review at santo stefano rehabilitation institute

M. D'Amico^{1,2}, M. Vallasciani¹

¹L.A.M.P.O. (Laboratorio Analisi del Movimento e Postura) Istituto di Riabilitazione S.Stefano, Porto Potenza Picena (MC) Italy

²Bioengineering & Biomedicine Company Ltd, San Giovanni

Introduction. Spine and posture disorders cover large interest in rehabilitation. Quantitative functional evaluation represents the main goal in Posture and Movement/Gait analysis, however very few studies outline the behaviour of spine during such tasks. To overcome such limits, we propose a complete 3D parametric biomechanical skeleton model to be used in quantitative analysis. **Materials and methods.** Posture and Movement/Gait analysis are performed by 3D Opto-electronic stereophotogrammetric measurements of body landmarks labelled by passive markers [1]. Depending on different analysis purposes, the model (based on anatomical findings reported in literature and on specially developed processing procedures) can work at different stages of complexity. It can be scaled to fit the subject's skeleton by using different acquisition protocols involving assorted body labeling, providing subject's anthropometric measurements. The model is able to fully integrate data deriving from force platforms, SEMG, foot pressure maps. By means of data fusion and optimisation procedures all these inputs are used in the model to assess internal joint forces, torques and muscular efforts. The possibility to compute the average of cyclic or repetitive tasks has been included as well. **Results.** "Orthopaedic" and "Neurologic" patients with different posture and movement disorders have been analysed and followed up with this methodology. The provided quantitative outcomes allowed identifying and precisely differentiating pathological patterns proving the model usefulness in clinical and rehabilitation fields. Paradigmatic examples to show method's ability to assess patient's functional characteristics will be fully detailed. **Conclusion.** The proposed approach showed its capability to deepen the analysis of human Posture and Movement in a fully detailed way, allowing to try to unveil the complexity of its Biomechanics and underlying Motor Control Mechanisms.

References

1. M. D'Amico et al., A 3-D Biomechanical Skeleton Model And Processing Procedure For Posture And Movement Analysis, Eur. Med. Phys. 2007:43 (Suppl. 1)

Predictive value of effect muscle electrostimulation and physiotherapy in the childhood flat foot .

M. Ranieri, M. Sciuscio, S. Mennuni, R. Marvulli, A. Camporeale, D. Vittore, G. Megna

?????

Introduction. Childhood flexible flat foot is the most common paramorphism of the lower limb. Functional deficiency of the muscles that support the arch causes the medial longitudinal arch. **Materials and methods.** Our study provides the recruitment of young patients with flat feet classified by the degree of severity of flat foot found by the Viladot method and through the static and dynamic baropodometric platform. The enlisted group was also processed to surface EMG. The first group, consisting of eight subjects, (3 women and 5 men) with a mean age of 6 years (between 3 and 10) was processed to a program FKT dedicated and selective electrostimulation. The second group, consisting of six subjects, was treated with push elastic medial plantar (plantare SEM). **Results.** Significant improvements of data of sEMG, Viladot method and static and dynamic baropodometric platform is noted in the first group instead in the second one. **Conclusion.** The data emerging from preliminary evaluations of sEMG point out that the reduced activation of studied muscles in certain subjects, may be involved in determining the infant and flat foot and as selective enhancement of those obtained by FKT enable the achievement of results statistically more significant in the first group compared to the second subject exclusively to KT.

References

1. D. Vittore, L. Molfetta, O. Recchia, A. Sgura. Considerations about the function of muscles in the mechanical balance of plantar arch. Chir. Del Piede, 8, 1984
2. Carlo J. De Luca. The use of surface electromyography in biomechanics. The International Society for Biomechanics, 5 July 1993

3. Beck RB, O'Malley MJ, Stegeman DF, Houtman CJ, Connolly S, Zwarts MJ Tracking motor unit action potentials in the tibialis anterior during fatigue. *Muscle Nerve*. 2005 Oct;32(4):506-14.
4. Vittore D, Patella V, Petrerà M, Caizzi G, Ranieri M, Putignano P, Spinarelli A. Extensor deficiency: first cause of childhood flexible flat foot. *Orthopedics*. 2009 Jan;32(1):28.

Acquired prosopagnosia: a case report.

C. Fassio¹, M. Manera², F. Malinverno², C. Pistarini¹
¹Neurorehabilitation Unit, IRCCS Fondazione S. Maugeri, Pavia (Italy)
²Psychology Unit, IRCCS Fondazione S. Maugeri, Pavia (Italy)

Introduction. The work is a case report of a patient with a right temporal ischemic stroke of cardioembolic origin, assessed for his prosopagnosic impairment with the group of tests optimized for the detection of faces recognition, that was create following the model of faces processing by Bruce and Young (1986), then modified by Ellis (1986). The group of tests was first administered to 114 healthy individuals, divided in different categories for gender, age and education. The purpose of the work is to demonstrate if the group of tests, shaped with the aim of assess single unit of face recognition, associated with tests of objects recognition, is able to localize the functional impairment along a flow chart of cognitive processing subunits. The patient in this work has a severe prosopagnosic impairment, detectable even only with simple clinical observation. But the assessment with this group of tests let us localize the site of the lesion and confirm Bruce and Young's model. **Materials and methods.** Patient's visuo-perceptive skills were assessed with some tests for the early processings and for object recognition. **Results.** The use of this kind of assessment allows us to demonstrate in this case a preservation of the early processing and an impairment in the subsequent parts of the flow chart of the model, that means the integrity of the parallel processes. **Conclusion.** In this case all clinical data and cognitive assessment results confirm the presence of prosopagnosia not associated with visual agnosia.

References
 Bruce V., Young A.W., (1986) Understanding face recognition. *British Journal of Psychology*, 77,305-327
 Ellis H.D. (1986). Disorders of face recognition. In: *Neurology: proceedings of the 13th World Congress of Neurology*. Edited by K. Poeck, H.F. Freund and H. Ganshirt. Berlin: Springer-Verlag, pp. 179-187
 Manera M., zonca g., Pistarini C., Luzzatti C. Una batteria per la diagnosi dei disturbi prosopagnosici. Validazione e descrizione di pazienti con lesioni cerebrali. In: *Atti del V Convegno Nazionale SIRM, Senigallia (AN)*, 2005:114.

Professional comfort and discomfort in a group of health assistance operators

M. Manera¹, I. Giorgi¹, C. Monaco¹, G. Maggioni², C. Pistarini²
¹Psychology Unit, IRCCS F.S. Maugeri, Pavia (Italy)
²Neurorehabilitation Unit, IRCCS F.S. Maugeri, Pavia (Italy)

Introduction. The Italian legislative decree 81 issued on the 9th of april 2008 deals with all main rules for work risk management and it provides the risks assessment also correlated to work stress, considering different issues for legal, work and social safeguard as well as for mental, physical and social wellbeing. Several surveys have been performed with the aim to assess the health worker's wellbeing and they are mainly based on the use of questionnaires, which purpose is to investigate various variables, but few consider burnout development in different operators working in a coma unit, intensive rehabilitation unit for acquired brain injury and spinal cord unit. The aim of this study is to estimate demographic data and professional wellbeing/unwellbeing conditions in a work group of health professionals in our departments. **Materials and methods.** A sample of 98 health workers, actually working in the Neurorehabilitation Department, Spinal Unity and Coma Unity of the Maugeri Foundation in Pavia has been considered. Professional figure involved are: physicians, physiotherapists, nurses, speech therapists, occupational therapists. The questionnaire administrated are the OCS (Organizational Checkup System) and the OSI (Occupational Stress Indicator). Epidemiological and observational data will be investigated. **Results.** Evaluation of the results from the questionnaires are still ongoing and we will compare data between and within different operators groups. **Conclusion.** We expect to describe the sociodemographic and professional characteristics as well as the development of burnout (or wellbeing/unwellbeing) in the medical, nursing

and therapist staff of a health working group in a particular area of neurorehabilitation.

References
 1. Organizational Checkup System, Italian Edition. 2004
 2. OSI, Occupational Stress Indicator. Cary L. Cooper, Stephen J. Sloan, Stephen Williams, Giunti O.S. Organizzazioni Speciali – Firenze 1998.

The social operator in a coma unit: the interaction with the territorial social healthcare net

O. Nervi¹, G. Maggioni², A. Caroli², C. Casarini², C.Pistarini²
¹Social assistance dept., S.Maugeri Foundation, IRCCS Pavia, Italy
²Coma Unit, S.Maugeri Foundation, IRCCS Pavia, Italy

Introduction. The primary aim of the social assistance operator within the multiprofessional team of the coma unit is to identify the needs and necessities of the person in charge. The social operator mission is to help parents, related and caregivers to knowledge, comprehend and deal with the legal and constitutional rights for health and social assistance of a patient in a coma or vegetative state. Several meetings are held both with the single caregiver in charge and within the team meetings to define health, social and legal needs of the patient in order to address the caregivers to the correct territorial institutions. The link with the territorial services and longstay hospitals is directly managed by the social operator to facilitate the discharging process from the coma unit. The intervention of the social operator is performed to look for a tutor who it doesn't exist, contact directly the social territorial services to describe the patient needs, apply for all benefits deserved. Aim of the retrospective study is to define the sociodemographic data and the health assistance pathway of a population of coma and patients in a vegetative state admitted and discharged to the services available in the territory of Pavia; then define all discharging process. **Materials and methods.** In this retrospective study we considered the patients who have been admitted and discharged from our coma unit to the territorial services (longstay hospital, residences for disabled, home, etc) in recent years, from march 2006 to march 2010. Diagnosis of the patients considered were: vegetative state, minimally conscious state, coma. Sociodemographic data were collected during the psychosocial counseling meetings with caregivers. A register of all information was recordered. All queries of the social operator investigated the patient's needs, family definition, services availability nearby the patient original residence, benefit already existing, legal status of the patient and the legal administrator and tutor. **Results.** Evaluation of the data from the social operator register are still ongoing. **Conclusion.** We expect to describe the sociodemographic and health care pathway after discharge of patient in a coma state and vegetative state in the Pavia and Lombardia region.

AWS incidence

F. Pessina¹, F.Miccichè², C.Donetti², C.Costantino², M. Saccavini¹
¹Azienda Ospedaliero-Universitaria Parma
²Università degli Studi Parma

Introduction. AWS is a syndrome which limits itself and which arises after the dissection of the armpit or after the removal of the sentinel lymphonode. Clinically it is characterized by the appearance of the fibrous cords in the cavity of the armpit accompanied by pain and a limited functioning of the omolateral limb. At present the incidence of such syndrome isn't clarified in literature with incidence from 6% to 72%. At present there aren't even any clear guidelines on the most adequate rehabilitative intervention. **Materials and methods.** The protocol of the breast unit in the hospital of Parma foresees a rehabilitation follow up of precocious post-operating complications in patients who underwent breast surgery and lymphoadenectomy of the armpit. The current evaluation is carried out using the VAS scale, Constant scale and SRQ and diameter of the operated limb. To such scales of evaluation the introduction of specific items is foreseen for the evaluation of AWS such as the visualization of the lymphatic cords in arm abduction and their level of extensibility. **Conclusion.** The main studies of literature are of a retrospective type and don't use scales of evaluation of pain and ROM, therefore consider it useful to impose a prospective study to evaluate the real incidence of such post-surgical syndrome. Our objective is to evaluate, besides the real incidence of AWS in patients operated of total armpit lymphadenectomy, also the most frequent impairments correlated to such syndrome and the repercussions on the ADL in order to establish a possible protocol specific for patients affected by AWS.

References

1. A.Moskovitz, O.Benjamin, et al. Axillary web syndrome after axillary dissection. *The American journal of surgery* 2001;181:434-439.
2. Leidenius M, Leppanen E, Krogerus L, et al. Motion restriction and axillary web syndrome after sentinel node biopsy and axillary clearance in breast cancer. *Amer J Surg* 2003;185:127-130.

Rehabilitation of patients with anterior cruciate ligament reconstruction

K. Ljubinkovic¹, M. Vukicevic², G. Gavrilovic²

¹Primary Health Station "Stari grad" Belgrade, Serbia

²Institute for Orthopedic Surgery "Banjica" (IOHBB) Belgrade, Serbia

Introduction. Disrupture of ligament crutiatum anterior (LCA) represents one of the most frequent sports injuries. It leads to the knee chronic anterior-lateral rotational instability. **Materials and methods.** In the period from 2005-2009, 400 patients, have been analyzed, who have been treated by surgery at the Institute for Orthopedic Surgery "Banjica" and by physical therapy at the Primary Health Station "Stari grad" afterwards. There were 280 male and 120 female patients, age: 14-45 (X=28). They were followed: 12- 60 months (X=36). All patients were operated by the Technique Single Bundle which implied the reconstruction of the ligamentum cruciatum anterior (LCA), with the application of the semitendinosus-gracilis graft. Immediately after the surgery all patients were rehabilitated under the Protocol of the Institute for Orthopedic Surgery "Banjica," and by physical therapy at the Primary Health Station "Stari grad" afterwards. **Results.** For the evaluation of the treatment's result, the value of the LYSCHOLM score before (X=51,78) and after (X=93,54) has been compared. The significance of the difference was tested by the Student's t- test (p,0,001). **Conclusion.** On the basis of this research and the results of the statistical analyses it can be concluded that the value of the Lyschholm Score at the end of the treatment was improved, compared to the values at the beginning of the research, with the high statistical significance. Such a result of the treatment allows us to consider the treatment protocol as successful and recommendable

References

- Lopes I, Pinto R, editors. Clinical outcome of rehabilitation of anterior cruciate ligament reconstruction with hamstring tendon grafts: Relationship between functional and subjective scales and isocinetic testing. Proceedings of the 5th World Congress of the International Society of Physical and Rehabilitation Medicine; 2009 June 13-17; Sao Joao, Oporto, Istanbul Turkey 2009.
- Zhou M, Gu L, Factors affecting proprioception recovery after anterior cruciate ligament reconstructed. Proceedings of the 5th World Congress of the International Society of Physical and Rehabilitation Medicine; 2009 June 13-17; Peking Beijing China, Istanbul Turkey 2009.
- Rosulescu E, Zavaleanu m, editors. Knee functional recovery in patients with anterior cruciate ligament reconstruction. Proceedings of the 5th World Congress of the International Society of Physical and Rehabilitation Medicine; 2009 June 13-17; Craiova Romania, Istanbul Turkey 2009.
- Nakajima M, Kobayashi R, editors. Quadriceps femoris strengthening maneuver for patients undergoing ACL reconstruction. Proceedings of the 5th World Congress of the International Society of Physical and Rehabilitation Medicine; 2009 June 13-17; Kibi International University Takahashi Japan, Istanbul Turkey 2009.
- Ligia R, Mirela C, editors. Monitoring of rehabilitation after ACL injury at athletes. Proceedings of the 5th World Congress of the International Society of Physical and Rehabilitation Medicine; 2009 June 13-17; University Craiova, Craiova Romania, Istanbul Turkey 2009.

Rehabilitation of patients treated by arthroscopic stabilization for the anterior instability of the shoulder

M. Vukicevic¹, K. Ljubinkovic², G. Gavrilovic¹

¹Institut for Orthopedic Surgery "Banjica", Belgrade, Serbia

²Primary Health Station "Stari grad", Belgrade, Serbia

Introduction. Articulatio Humero Scapularis is considered as the spherical ankle and is one the most movable and unstable joints. In the more than 90% of cases these are the anterior instabilities of the shoulder. **Materials and methods.** In the period from 2005-2009, 150 patients have been analyzed. All of them have been treated by the arthroscopic stabilization of anterior capsula with the Fixation System Anchore Screws at the Institute for Orthopedic Surgery "Banjica". There were 90 male and 60 female patients, age: 17-42 (X=25). Immediately after the surgery, the physical therapy and the rehabilitation of the patients has been started under the Protocol of the Institute for Orthopedic Surgery "Banjica," and by physical the-

rapy at the Primary Health Station "Stari grad" afterwards. **Results.** For the evaluation of the treatment's results, the value of the Rowe's score before (X=9) and after (X=30) has been compared. The significance of the difference was tested by the Student's t-test (p,0,001). **Conclusion.** On the basis and the results of the statistical analyses it can be concluded that the value of the Rowe's score at the end of the treatment was improved, compared to the values before the surgery, with the high statistical significance. Such a result of the treatment allows us to consider the treatment protocol as successful and recommendable.

References

- Diklic I. Surgery of the shoulder .2 nd ed. Beograd (Serbia):Naucna KMD 2009
- Habermyer M, Magosch P. editors. Classifications and Scores of the Shoulder . (Heidelberg Germany): Springer Berlin 2006.
- Canbulat N, Ucak A, Meral S, editors. Tear-size dependent rehabilitation in rotator cuff repair. Proceedings of the 5th World Congress of the International Society of Physical and Rehabilitation Medicine; 2009 June 13-17; Istanbul Turkey; Istanbul, 2009.
- Micheo W, Rehabilitation of the most common sport injuries: Shoulder injury and ACL injury; Proceedings of the 5th World Congress of the International Society of Physical and Rehabilitation Medicine; 2009 June 13-17; San Juan, Puerto, Istanbul Turkey 2009.
- Tomanova M. Shoulder stabilization in rehabilitation center in Brandy's nad Orlic; Proceedings of the 5th World Congress of the International Society of Physical and Rehabilitation Medicine; 2009 June 13-17; Czech Republic, Istanbul Turkey, 2009.

Functional influence of botulinum neurotoxin type A 150kDa treatment (Xeomin®) of multifocal upper and lower limb spasticity on chronic hemiparetic gait: a case report

M. Falso, R. Galluso, A. Malvicini

Section of Neurological Rehabilitation, Clinical Institute Città di Brescia, Brescia, Italy.

Introduction. Xeomin® (Merz Pharmaceuticals GmbH, Frankfurt am Mein, Germany) has become available in the last years in some European countries, but its efficacy has been demonstrated in adult upper limb spasticity in one multicentric placebo controlled study only. The aim of this case report was to assess whether walking velocity and hemiplegic shoulder pain (HSP) could be improved in a patient with chronic motor disorders related to UMNS by treating a multifocal upper and lower limb spasticity with a new formulation of Botulinum Neurotoxin Type A free of complexing proteins (Xeomin®). **Materials and methods.** A woman, 67 years old, with a chronic residual left hemiparesis with chronic hemiparetic gait attributable to right hemisphere stroke. At the first visit (T1), comprehensive clinical (Modified Ashworth Scale, Visual Analogique Scale, Trunk Control Test, Motricity Index) and observational gait (Visual Gait Analysis, Gait velocity) examinations were performed; after 5 days, patient received a multifocal and multisegmental BTX-A injection. BoNTX-A (Xeomin®) was injected in the left pectoralis complex, left biceps, left flexor digitorum profundus, left lumbricalis, left tibialis posterior and soleus. At the initial evaluation, our patient had been undergoing physiotherapy. One week (T2) and 1 month (T3) later, our patient underwent a new examination with the same procedures used at time T1. **Results.** We observed a significant change in all clinical parameters, including quality of gait and walking velocity. Patient showed a significant decrease of shoulder pain as like as of proximal spasticity of the upper limb and lower limb and arm voluntary function increased in testing normal daily activity tasks. **Conclusion.** This interventional case study suggests that a comprehensive clinical-observational investigation is simple to use and provide useful data in the evaluation of the functional influence of botulinum neurotoxin type A 150kDa treatment (Xeomin®) on chronic hemiparetic gait and hemiplegic shoulder pain.

References

1. Wissel J, Ward AB, Erztgaard P, Bensmail D, Hecht MJ, Lejeune TM, Schnider P. European consensus table on the use of botulinum toxin type A in adult spasticity. *Journal of Rehabilitation Medicine* 2009; 41: 13-25.
2. Kanovsky P, Slawek J, Denes Z, Platz T, Sassini I, Comes G, Grafe S. Efficacy and safety of botulinum neurotoxin NT 201 in poststroke upper limb spasticity. *Clinical Neuropharmacology* 2009; 32: 259-265.

Spasticity in patients with severe acquired brain injury: an impairment that is poorly understood and poorly measured

L. Novelli, M. Falso, P. Bettini, R. Galluso, G. Monesi, A. Malvicini
Section of Neurological Rehabilitation, Clinical Institute Città di Brescia, Brescia, Italy.

Introduction. The aim of this interventional evaluation study was to assess the acknowledgment of spasticity secondary to severe brain injury by observing 27 patients recovered in our Neurological Rehabilitation Section of the Clinical Institute Città di Brescia (Italy). **Materials and methods.** 27 patients (14 males, 13 females; mean age 65+/-15yy), affected by severe acquired brain injury and recovered in our Neurological Rehabilitation Section from february to october 2009, were recruited in this study. In accordance with our inclusion criteria (GCS < or = 8, LCF < or = 3, DRS < or = 22), patients were divided in 4 observational groups (post-stroke group, post-haemorrhagic group, post-anoxic group, post-traumatic group) and evaluated under an epidemiological, clinical and functional point of view. Patients had been undergoing physiotherapy during the recovery and observational period. **Results.** Our data showed that 85% of patients recruited developed an upper and/or lower limb spasticity, never demonstrated in other clinical evidences. However, these parametric data were not statistically significant ($p > 0.05$). All patients received drug and physiotherapeutic treatment but only 30% of them will not develop limb spasticity. In line with our non-parametric statistical analysis, no correlation between the development of limb spasticity and nutritional and co-morbidity patients status was observed. **Conclusion.** Our observational and investigational study demonstrated that to date, there is no clinical advanced evidence about the pathophysiological mechanisms underlying the development of spasticity in patients affected by vegetative state secondary to severe acquired brain injury.

References

1. Zampolini M. I percorsi riabilitativi delle persone con grave cerebro lesione acquisita dalla presa in carico al follow-up. EUR MED PHYS 2008, 44 Suppl 1 to No. 3.
2. The Multi-Society Task Force on PSV. Medical aspects of the persistent vegetative state (first of two parts). N Engl J Med 1994; 330: 1499-1508

Community action for inclusion in rural Nepal

S. Shrestha, N. Kaji, F. Colizzi, F. Cavallo
WATCH/Nepal and AIFO/Italy

Introduction. Disability is closely linked to poverty. Community awareness about disabled persons is limited, also because of stigma and lack of knowledge. Involving community groups in identification of persons with disabilities in their communities and understanding the links between poverty and disability is important for promoting inclusion. **Materials and methods.** WATCH/Nepal with support from AIFO/Italy, working with women's self-help groups in three rural areas of Nepal – in Okhaldhunga district in high mountains, in hills of Chaimalle sub-district in Kathmandu and in plains of Rupandehi in Terai region, worked with groups of rural poor women to initiate a process of community surveys for identification of persons with disabilities. In the three areas, a total of 19,210 persons in 3,397 poor households were surveyed. Women's self-help groups defined local criteria for identifying the poorest persons among the rural poor. Wealth ranking of families with disabled persons was done by the local women to identify the poorest among them. **Results.** 355 disabled persons were identified in the three areas with average prevalence of 1.84% (range 1.2 to 2.19%), 54.9% men 45.1% women, and 34.1% were children below 15 years. Globally, wealth ranking identified 8.43% of families as being poorest. In the same population, among the families of persons with disabilities, 75.7% were among poorest, confirming links between poverty and disability. Women self-help groups shared the study findings with the community and proposed measures for inclusion of persons with disabilities in different community development activities. In each area an organisation of persons with disabilities (DPO) was formed for creating awareness and for advocacy for inclusion and mainstreaming. **Conclusion.** Families with disabled persons are at increased risk of poverty. Community action can promote inclusion.

References

- WHO, Disability and Poverty - WHO Fact Sheet, Disability and Rehabilitation team, World Health Organisation (WHO/DAR), Geneva, 2006.
 DFID, Disability, Poverty and Development, UK Department for International Development (DFID), February 2000.

Pradhan R. & Shrestha A., Ethnic and caste diversity: Implications for Development, NRM Working paper 4, Asian Development Bank, Nepal Resident Mission, June 2005.
 WHO/DAR, report of Inter-country Workshop on Strategy for Improving Rehabilitation Services, Kathmandu, Nepal, 26 – 30 August, 2002.

Notes from tuuru

M. Ricci

Direttore Medicina Riabilitativa, Ospedali Riuniti Ancona

During these last years I felt the need of doing some relief and humanitarian assistance to foreigners or abroad in third world countries. I finally ended up with a friend of mine about this idea: he addressed me to a priest involved in running a nonprofit organisation whose mission is about helping children in Africa. Last October I went to Kenya, in a small town called Tuuru, 450km from Nairobi, to a Mission Hospital runned by nuns and priests. There are recoveries for newborn children and for disable children and four italian nuns working there: Suor Francesca, the cook; Suor Adriana, the physiotherapist; Suor Andreina, the midwife; Suor Giacomina, she's the oldest and she cares public relations. When I got to Tuuru I thought I had to manage with children hit by Acute Anterior Poliomyelitis butt five years ago this hospital was turned into a recovery for spastic children affected by cerebral diseases, suffering for multiple motor and cognitive disabilities. Suor Adriana's work is based on proprioceptive and neuromuscular stimulation, passive mobilisation and neuro-motor re-education. She's aided by three african auxiliary nurses without a degree. This Mission can also count on an orthopaedic workshop where three men are in charge to make prosthesis, orthopaedic shoes, crutches, wheelchairs, walking trolleys and other walking-aid systems. As far as I wanted to improve children's benefits from these supports during their walking or playing I modified some of the prosthesis, the feet supports and made new rehabilitative projects. The results were consistent and very gratifying: the children got to walk better and therefore they were more playful. Finally I promised them to go back in order to put the projects through with the introduction of Botulinum Toxin and phenolic-alcohol treatment to reduce spasticity.

Review of the drugs for osteoporosis treatment

Şansın Tüzün

Professor of Istanbul University, Cerrahpaşa School of Medicine, Department of Physical Medicine and Rehabilitation

Osteoporosis is defined as a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture. Therefore, medical treatment of osteoporosis should be based on anti-fracture efficacy of any anti-osteoporotic agent. First of all, it is crucial to decide that, who should be treated? Recently, there is a very common concept that is, before the patient election for any pharmacological intervention, it should be considered not only bone mineral density measurements, but also ten years fracture risk assessment tool which is called FRAX. Having a fracture is also important in both deciding to give a treatment and choosing the anti-osteoporotic agent since each of them has different effect depending on the existence of prevalent fractures. In this session, it will be focused on primarily current therapeutic agents, their efficacy, properties and limitations. There are so many anti-osteoporotic agents have been proved to be effective on reducing vertebral fracture rate which is mandatory to be approved for osteoporosis treatment. However the desirable effect is a global one which includes non-vertebral and hip fractures as well. Major pharmacological interventions are the bisphosphonates (alendronate, risedronate, ibandronate, and zoledronate), raloxifene, calcitonin, strontium ranelate, and parathyroid hormone. Until recently, hormone replacement treatment was also widely used, however, HRT will not be explained in this presentation since it is rather an option for prevention of the disease and controlling the vasomotor symptoms resulting from the menopause. On the other hand, Raloxifene is belonging to SERM group which acts an estrogen agonist on bone tissue selectively and antagonist on the other tissues was approved for treatment of osteoporosis. Raloxifene is effective in preventing vertebral fractures in both low and high risky population. Medical agents mainly have an anti-resorptive effect on bone tissue, except the only pure anabolic agent we have that is 1-34 fragment of parathyroid hormone which is called teriparatide. Strontium ranelate have both anti-resorptive

and anabolic properties which have been shown in vitro. However the underlying mechanism of action is not well-defined yet. Among all anti-osteoporotic agents, alendronate, risedronate, zoledronate, and strontium ranelate have the data with regard to their efficacy on hip fractures that are extremely important for public health. In the management of osteoporosis it is crucial to treat the high risky population. In elderly, especially over the age of 75, risedronate and strontium ranelate have been to be effective in preventing hip fractures. Relatively new bisphosphonate, intra-venous zoledronic acid has presented us a hallmark of a dose regimen which needs once a year application. It has also a global efficacy on fracture risk reduction. There is no one size fits all treatment for osteoporosis. Each patient should be evaluated separately and considered for clinical risk factors. In the medical treatment of osteoporosis, still the main problem is; who should be treated? The first step in the management of osteoporosis should be to use some strategies in order to access to the high risky population and treat them.

Intermittent Hypobaric Pressure in the therapy of microcirculation disturbances in Diabetics

G. Devečerski¹, B. Miličević², B. Novaković¹, N. Radaković³, E. Mujić Skikić⁴

¹*Clinic for Medical Rehabilitation, Clinical Center of Vojvodina, Novi Sad, Hajduk Veljkova 9, Serbia*

²*Institute for Public Health-Division of Labour Health Care Novi Sad, Novi Sad, Serbia*

³*Center of Integrative Medicine-CIM, Novi Sad, Majevicka 16, Serbia*

⁴*Rashid Hospital, Dubai UE*

Introduction. Among a broad range of standard therapy procedures for improving circulation in diabetics, in this scientific work we have chosen to use the positive effect of hypobaric bag treatment on skin microcirculation with Greensac® (Iskra Medical, Slovenija). **Material and methods.** The "Greensac" device is a therapeutic massage system which, using the principle of suction, creates an underpressure in a specially designed sac that completely enwraps the lower extremities. The study included 91 patients with past medical history of diabetes mellitus type IIb (T2D) of average age of 56.2 years and average history of T2D of 16.5 years. The following parameters have been followed: circumference of the extremity, skin temperature, blood pressure, subjective sense of pain. All the data were statistically processed by using the standard statistic methods through statistic program SPSS 7.0. **Results.** The results (Table II.) show that the circumference of the extremities was statistically significantly decreased (student t test)- in the level of patella the statistically significant difference determined by the Student t test was $p < 0,001$, while in the level 10cm below patella, $p < 0,05$. The skin temperature in the popliteal fossa has been increased by 2°C ($p < 0,001$), above a. dorsalis pedis by 1,5°C ($p < 0,05$). The sense of pain was statistically significantly decreased- $p < 0,01$. The values of blood pressure and hemoglobin oxygen saturation, measured by puls oxymeter, had not changed significantly. **Conclusion.** Statistically significant lowering of leg volume parameters, subjective pain relief, as well as a significant increase in skin temperature lead to a conclusion that treatments with the hypobaric sac "Greensac®" (10 treatments in total) have had beneficial effects on peripheral circulation of our patients and improved their quality of life.

References

- Devečerski G, Teofilovski M, Milicevic B, Konstantinovic Lj, Lazovic M, Radakovic N, Mujovic N, Krstin A, Jelenc J. Effects of Greensack® on lower limb functional status. *Europa Medicophysica* 2006 42 (Suppl):145-6.
- Ramaswami G, D'Ayala M, Hollier LH, Deutsch R, McElhinney AJ. Rapid foot and calf compression increases walking distance in patients with intermittent claudication: results of a randomized study. *J Vasc Surg.* 2005 May;41(5):794-801.
- Gardner AW, Poehlman ET. Exercise rehabilitation programs for the treatment of claudication pain: a meta-analysis. *JAMA* 1995;274:975-980
- Lepantalo M, Sundberg S, Gordin A. The effects of physical training and flunarizine on walking capacity in intermittent claudication. *Scand J Rehabil Med.* 1984;16(4):159-62.
- Allen EV, Brown GE. Intermittent pressure and suction in the treatment of chronic occlusive arterial disease. *JAMA* 1935; 105:2029-34.
- Himmelstrup H, Himmelstrup B, Mehlsen J, Trap-Jensen J. Effects of vacuum in intermittent claudication: a controlled cross-over study. *Clin Physiol* 1991 May;11:3 263-9.

The Effect of Sellas Laser for the Treatment of Hypertrophic Scars Contracture

Ki Un Jang, Ji Soo Choi, Ju Youn Lee, Jeong Hyeon Mun, Cheong Hoon Seo

Department of Rehabilitation Medicine, Burn Center, Hangang Sacred Heart Hospital, Hallym University Medical School, Seoul, South Korea

Introduction. Fraxel laser has been used with variable degrees of success in the treatment of skin problem, the majority of previous studies was examined in the cosmetic problem, not in the burn scar which induce joint contracture.^{1,2} The Sellas laser treatment for the burn scars is not well established.^{3,4} The purpose of this study was to assess the role of Sellas laser in the hypertrophic scar with the controlled study. **Materials and methods.** Twenty patients who had joint contractures by burn hypertrophic scars were recruited into the study. Two similar sites of hypertrophic scar of each patient were selected and randomly determined at the one site to be 'laser (treated) site' and the other site to be 'control (untreated) site'. Each 'laser site' have received sellas laser treatment for two to five treatments at 2-week intervals. All patients were assessed before treatment and after treatment with ultrasonography for thickness, cutometer for viscoelasticity, mexameter for pigmentation and erythema.^{5,6,7} **Results.** The thickness of laser treated sites was significantly decreased from 4.83mm before treatment to 4.32mm after treatment in 3 weeks, but in the control(untreated) group the thickness was slightly increased from 4.50mm to 4.63mm. For other assessment, melanocyte was reduced in laser sites from 209.8 to 200.5, but in the control sites melanocyte was increased from 199.2 to 200.5 in 3 weeks, insignificant change in both sites. Erythema was reduced from 451.3 to 448.0 in laser sites, however in control sites increased from 427.5 to 436.5 in 3 weeks, statistically insignificant in both sites. **Conclusion.** In this controlled study, Sellas laser could achieve a positive result significantly for hypertrophic scars thickness management, however our study indicated there was an also insignificant degree of other objective parameters, which could need further study or longterm follow up study.

References

- Niessen FB, Spauwen PH, Chalkwijk J, et al. On the nature of hypertrophic scars and keloids: a review. *Plast Reconstr Surg* 1999;104:1435-58.
- Karsai S, Roos S, Hammes S, Raulin C. Pulsed dye laser: what's new in non-vascular lesions? *J Eur Acad Dermatol Venereol* 2007;21:877-90. Review
- Manuskatti W, Fitzpatrick RE. Treatment response of keloidal and hypertrophic sternotomy scars: comparison among intralesional corticosteroid, 5-fluorouracil, and 585-nm flashlamp-pumped pulsed-dye laser treatments. *Arch Dermatol* 2002;138:1149-55
- Niwa ABM, Mello APF, Torezan LA, Osorio N. Fractional photothermolysis for the treatment of hypertrophic scars : clinical experience of eight cases. 2009;35:773-778
- Chan HH, Wong DS, Ho WS, et al. The use of pulsed dye laser for the prevention and treatment of hypertrophic scars in Chinese persons. *Dermatol Surg* 2004;30:987-94
- Kuo YR, Wu WS, Jeng SF, et al. Activation of ERK and p38 kinase mediated keloid fibroblast apoptosis after flashlamp pulsed-dye laser treatment. *Lasers Surg Med* 2005;36:31-7.
- Bjerring P, Clement M, Heickendorff L, Lybecker H, Kiernan M. Dermal collagen production following irradiation by dye laser and broadband light source. *J Cosmet Laser Ther* 2002;4:39-43

Rehabilitation of a patient with right pyramidal syndrome in combination with amputation of the upper half of the arm- case-report

F. Armakola, A. Kotroni, M. Xenaki, K. Mihout, E. Papadaki, E. Manasos, E. Bakas

Department of physical medicine and rehabilitation. Athens, KAT general hospital

Introduction. The upper limb amputation is relatively rare in the female population, while the combination of stroke with pyramidal syndrome in the opposite side is a real challenge to achieve functionality and independence in performing activities of daily living (ADL). **Presentation of a case report.** A 44 years old female, was admitted on 18/10/08 in the E.D to Tzaneio hospital after a reported traffic accident (car -pedestrian). As a result an amputation of the left upper extremity was performed (upper half of the arm). She was then transferred to KAT hospital, microsurgery department where great efforts were made to reattach the arm. The efforts were unsuccessful due to traction of the brachial artery. In addition, the patient presented wounds on the right temporal area and fractures of the left mandibula without dislocation and therefore no disturbances of

convergence. The review of other systems and brain, revealed no pathologic findings. On 12/11/08 the patient presented right pyramidal hemiparesis, visuoperceptual deficits and dysarthria. A new computerized tomography was obtained which revealed hyperdense left parietal gray matter. She was diagnosed with ischemic stroke and treated by neurologists. On 24/11/08 was examined and assessed by the physiatrist rehabilitation and was transferred to the department of physical medicine where she followed a rehabilitation program which began immediately. The patient on admission was entirely dependent person (Barthel Index 20/100) with an excellent cognitive level (MMSE: 26/30). Her Barthel index was low due to motor deficit, but she was significantly psychological burden. The patient followed a functional rehabilitation program to maximize the functionality of the right hemiparetic side) with the collaboration of occupational therapy, physiotherapy and psychological support. The patient refused the use of prosthetic device. Although the rehabilitation program was completed successfully (Barthel index at the exit 95/100) within three months, the patient remained hospitalized due to spondylodiskitis (CT, MRI, biopsy, culture of pus: klebsiella pneumoniae). The patient received 6 weeks antibiotic therapy (tygacil, collistin). The patient was discharged on 24/04/09 being fully independent in carrying out ADL. **Therapeutic interventions.** *Physiotherapy:* recline bed, exercises of range of motion, suppression techniques of pathological reflexes (Bobaths), proprioceptive neuromuscular facilitation techniques, strengthening exercises. *Occupational therapy:* exercises of balance and sitting (upright and sit-down exercises), transport exercises, personal hygiene, feeding exercises, dressing exercises, constrain induced therapy. *Psychotherapy:* Drug medication and clinical psychologist twice weekly. **Outcome:** The patient was discharged being fully independent in carrying out daily activities, which improved her psychological state of being able to fulfil her role in family and social environment, but she did not return to her work (beautician). **Discussion.** This case report is presented because of its rarity. It is difficult for patients with amputation at this level to have functional benefit from a prosthetic device because more than one joints have to be replaced, in addition more free levels have to be controlled and finally it is difficult to ensure the pivot point to support the joint. We have to mention that the coexistence of the pyramidal syndrome on the opposite side would normally make the patient's rehabilitation almost impossible. We believe that the impressive improvement in this case is due to brain neuroplasticity and to the obligated use of the suffering side.

Evaluation of articular ROM after muscle relaxation with hydrotherapy in VS or MCS patients

A. Caroli, A. Lupo, E. Meazza, C. Zanga, G. Maggioni, G. Bellaviti, C. Casarini, R. Mauri, C. Pistarini

Coma Unit, IRCCS S. Maugeri Foundation, Pavia (Italy)

Introduction. Spasticity is a major problem for patients in vegetative state (VS) or in minimally conscious state (MCS) both for the consequences effects and the difficulty in its treatments. Oral medication and other modalities such focal treatment with toxins, pump implants and surgery (neuro-surgical or orthopedic) can be used but side effects or lack of efficacy is higher in VS/MCS patients than in other. Physiotherapy is a crucial component of therapy, and relaxation is mandatory for a good result in the treatment for spasticity. Relaxation of the patients can lead to a better compliance to the passive mobilization of joints (shoulders, elbows, knees) and to the spasticity treatment of upper and lower limbs. Nevertheless, it is difficult to achieve a correct relaxation in VS/MCS patients. The aim of this study was to compare the effects of hydrotherapy on relaxation and spasticity in coma patients. Main purpose was to induce relaxation through hydrotherapy to enforce treatment for spasticity. Vital parameters such heart rate, blood pressure, respiratory rate have been considered to evaluate relaxation in VS/MCS patients. **Materials and methods.** The hydrotherapy was performed in a butterfly shaped indoor pool with one trained therapist. Water temperature was between 30° and 33° C. Therapy lasted 30 minutes per session, for 3 session/week. The therapist registered vital parameters, asworth scale and ROM evaluation of the patients before and after the hydrotherapy session. The body sections evaluated were: knee, shoulder and elbow joints; biceps, quadriceps femoralis and triceps suralis muscles. **Results.** Three VS patients and two MCS patients, with different asworth scale score and ROM impairments have been treated with hydrotherapy. Vital parameters evaluated (heart rate, blood pressure, respiratory rate), ROM and asworth scores showed an improvement in all patients treated. Data registering and compa-

ring are still in itinere to evaluate the possible significance. **Conclusion.** Hydrotherapy in VS/MCS can induce a relaxation and an improvement in Vital parameters. Treatment of spasticity can be enhanced from relaxation of patients. Therapist must be trained for hydrotherapy in VS/MCS patients.

References

- Keren O, Reznik J, Groswasser Z. Combined motor disturbances following severe traumatic brain injury: an integrative long-term treatment approach. *Brain Inj.* 2001 Jul;15(7):633-8.
Kesiktaş N, Paker N, Erdogan N, Gülsen G, Bıçkı D, Yılmaz H. The use of hydrotherapy for the management of spasticity. *Neurorehabil Neural Repair.* 2004 Dec;18(4):268-73.

Evaluation of vital parameters and articular ROM after treatment with Erigo® in VS or MCS patients

G. Maggioni, A. Caroli, A. Lupo, E. Meazza, C. Zanga, G. Bellaviti, R. Mauri C. Pistarini,

Coma Unit, IRCCS S. Maugeri Foundation, Pavia (Italy)

Introduction. Prolonged bed rest lead to a great reduction of exercise capacity, an important decreasing in ROM (rang of movements) of main somatic joints, and in coma patients it may leads to an increase in spasticity. More, vital parameters, such as heart rate, blood pressure, respiratory rate may get from an initial impairment to a dramatic reductions in cardiac – vascular – respiratory output with reduced compliance to oxygen uptake and compliance to mobilization. On the contrary, patients in vegetative state (VS) or in a minimally conscious state (MCS) are difficult to treat in an early phase of disease due to an great impairments of vegetative functions. Nowadays, new technology help to verticalize VS/MCS patients in an early phase on treatment combining passive mobilization to reach as soon as possible a stability in vegetative functions leading to a better treatment for joint mobilization and for spasticity. The aim of our observational study is to combine early verticalization, passive mobilization of lower limbs with only partially reduced body weight to evaluate changes in vital parameters, main joint passive ROM and spasticity. We used Erigo® for the treatment of VS/MCS patients. **Materials and methods.** We evaluated ten patients either in VS or MCS with daily treatments with Erigo® (5 days/week, for 30 minutes/session) for a month. Vital parameters (heart rate, blood pressure, respiratory rate) were registered pre and after the therapy session. All session parameter (gait speed, session length, verticalization angle) were similar and constant. Passive bilateral ROM of hips and knees, and asworth scores of bilateral quadriceps femoralis, triceps suralis and anterior tibialis were evaluated before and after sessions. A main confrontation between initial and final score (at the end of the month treatment) is performed. **Results.** Results and scale scoring are now under evaluation; first observations show that passive ROMs have been maintained in all patients, and in some case improved both at hips and knees. Heart rate improved in all patients, and respiratory and blood pressure maintained in all patients. Asworth score improved in several patients, but results are still in evaluation to look for possible significance. **Conclusion.** Treatment with Erigo® in an early phase of rehabilitation for VS/MCS patients helps to maintain passive ROM of lower limbs and to improve vital parameters. It may enhance relaxation and consequent treatment for spasticity.

References

- J. Cambier, M. Masson, H. Dehen "Neurologia" – IX Ed. – Ed. Masson 2009, pp 247-250.
Muller F. "New Technologic Approach to Minimizing Immobilization Effect of Patients with Brain Injury" Seventh World Congress on Brain Injury 14-03-2007.

An approach of the secondary lower-limb lymphedema through manual scar treatment. Preliminary study

F. Gariboldi, L. Bedodi, R. Olivieri, A. Caraceni

Fond. IRCCS Ist. Tumori, Milano

Introduction. We present two cases of improvement of secondary lymphedema after surgical scar manual treatment and subsequently multi-layer bandaging after inguinal lymphonode dissection. **Materials and methods.** Both of the patients had secondary lower-limb lymphedema associated to surgical scar characterized by adhesion and hyperdensity of the surrounding tissue, also they had analogies of the clinical characteristic. The treatment was divided in two phases: treatment of the scar through manual therapy for at least 15

sessions and subsequently multi-layer bandaging of the lower limb, including the pubic area, for a further ten days. The assessment was completed in 4 sessions: before and after the scar treatment, after of bandaging and 3 months later. **Results.** Mean results are circumference lower-limb reduction, the consistence of the oedema, the skin colour, less fatigue during walk and a little increase of hip range of motion. **Conclusion.** This study shows that there is a high response to this combined treatment and could be considered an effective therapy for this kind of lymphedema and scar.

References

1. S. Michelini, et al. Linee guida e protocolli diagnostico-terapeutici nel linfedema. Eur Med Phys 2008
2. E.Rizzi, et al. Il trattamento decongestivo combinato nella terapia del linfedema secondario: confronto fra protocolli terapeutici. Eur Med Phys 2008
3. Michelotti L. A new standardized classification tool which measures Lymphedema disability. The European Journal of Lymphology, 2007
4. C.Badger, et al. Physical therapies for reducing and controlling lymphoedema of the limbs. The Cochrane Collaboration.2006
5. N.Devoogdt , et al. Different physical treatment modalities for lymphoedema developing after axillary lymph node dissection for breast cancer: A review. Eur J Obstet Gynecol Reprod Biol. 2010

Long term Outcome after TBI; is Mild Injury really mild?

Rajiv Singh, Guru Venkateshwara, Siva Nair, Ramesh Munjal, Dipak Datta

Department of Neurorehabilitation, Sheffield Teaching Hospitals, United Kingdom.

Introduction. Mild traumatic brain injury(MTBI) is generally considered to have a good outcome compared to moderate or severe TBI. We followed a head injury cohort to compare difference in outcomes after one year. **Materials and methods.** All head injury admissions remaining in hospital after 24 hours were followed. We looked at this population with predominantly MTBI, at one year using the Extended Glasgow Outcome Score. Severity of TBI was measured by initial Glasgow Coma Score. **Results.** In one year we had 127 admissions with head injury staying beyond 24 hours. We were able to follow up 88 after one year of whom 86% were white, 28% had alcohol implicated in their injury and 7% were on warfarin and had been admitted as a precaution. Median age was 37.5 yrs (13-95) and length of stay was 3 days(0-30). MTBI made up 39(44%) of cases, moderate 39(44%) and severe 10(11%). The majority of patients had a good outcome at one year with 32(36.4%) in Good upper range, 28(31.8%) in Good lower, 23(26.1%) in Moderate upper, 2(2.3%) in Moderate lower, 2(2.3%) in Severe outcome and one patient had died. Comparison showed that 30(78.9%) of mild had a good outcome, 25(64.1%) of moderate TBI had a good outcome and 5(50%) of severe TBI had good outcome. While this suggests a trend, analysis found that $\chi^2=18.7$, $df15$, $p=0.227$ suggesting that there was no significant difference between severity of brain injury and outcome. **Conclusion.** Previous work suggests that MTBI has better outcome than moderate or severe injury. To date, our study does not show a difference between severity of TBI but the sample to date is small and we are continuing the study with ongoing follow-up.

Agitation and Associated Features in Traumatic Brain Injury

Rajiv Singh, Guru Venkateshwara, Siva Nair, Ramesh Munjal, Dipak Datta.

Department of Neurorehabilitation, Sheffield Teaching Hospitals, United Kingdom.

Objective. Agitation after traumatic brain injury is common and often interferes with recovery, rehabilitation and community re-integration. Incidence varies from 10-96% representing the lack of agreement in diagnosis. All studies of incidence and features of agitation have been from the USA with one in Australia. There are no published studies from the United Kingdom and we sought to look at features of agitation and outcome. **Materials and methods.** Consecutive TBI admissions with agitation were studied. Demographic details, clinical features, CT findings and treatment received were recorded and associations sought. **Results.** From 2005-08, 53 patients were identified with CB. Mean age was 41.2 yrs (SD 15.2), 34(64%) were male and 26 (49%) had previous psychiatric history including alcohol dependence. Average CB duration was 39.2

days(SD27.8) including those discharged with CB remaining. Based on behaviour type and frequency, 22 had severe CB, 21 moderate and 10 mild. Only 26 had good outcome in terms of resolution of symptoms or discharge destination with relatively easy management by family or carers. Factors associated with worse outcome were type of injury, alcohol excess, severity of initial behaviour, treatment with antipsychotics and duration of symptoms (all $p<0.001$) Using a stepwise logistic regression technique, further analysis showed that pathology, behaviour severity and duration of symptoms were all independent predictors for outcome ($p<0.001$) **Conclusion.** CB is common after TBI and can be difficult to treat. Little research has been done on outcomes in CB but our study has found a number of features that predict worse outcome and may assist management.

Disability index of post-mastectomy lymphedema: results of an italian study

M. Ricci¹, L. Sandroni²

¹Direttore Medicina Riabilitativa, Ospedali Riuniti Ancona

²Docente Inglese Scientifico, Università Politecnica Marche.

Introduction. In 2001 I proposed a scale to classify Disability by Lymphedema. Daily work transformed this scale introducing the Ricci Disability Index. Disability scale in lymphedema:

Degree	0	No Disability	index value between 0 and 0,5
	1	Low Disability	value between 0,6 and 1,5
	2	Low Disability	between 1,6 and 2,5
	3	High Disability	2,6 and 3,5
	4	Total Disability	3,6 and 4

The Ricci Index comes from ICF Items which show better the ADL in Lymphedema. These Items come form a checklist which gives the patient's Index.

Checklist (0-4): raising and carrying; use of hands; transport means; Washing; body care; Dressing; Cooking; housework; house objects care; interpersonal relations; Family relations; Personal relations; Job; Free-time. Every item is concerned with five specific answers, according to five points starting from level 4 to 0. The values average shows the patient's real disability and must be reported on the Disability Scale. Every items must be tested. The patient's value is related to his negative answer. **Materials and methods.** In order to study this scale and index we have formed an Italian Group since September. Each Author worked with List and Scale on Women with Big Arm Post-Mastectomy. **Results.** The Job shows that the checklist and it's questions are the only way to give uniform results and measure the patient's disability. **Conclusion.** The Study shows the validity of the Ricci Disability Index (RDI) and Scale (RDS) and the Authors propose to use it on all patients who suffer from Lymphedema.

References

1. M. Ricci: Proposal of Disability Scale for Lymphoedema. Eur J Lymphol vol XIX, n° 55, 2008.
2. World Health Organization. International Classification of Functioning, Disability and Health.Geneva,WHO 2001

Microsurgery in the Prevention and Rehabilitative Treatment of Lymphedema: State of the Art

C. Campisi, F. Boccardo

Department of Surgery, Unit of Lymphatic Surgery and Microsurgery, S. Martino Hospital, University of Genoa, Genoa, Italy

Introduction. Microsurgical techniques were used for both rehabilitative therapy and prevention of lymphedema. Derivative lymphatic micro-vascular procedures recognize today its most exemplary application in multiple lymphatic-venous anastomoses (LVA), and particularly in the end-to-end telescopic technique, that allows to avoid any contact between lymphatics and the blood stream. **Materials and methods.** More than 1800 patients with peripheral lymphedema have been treated with these techniques. For those cases where a venous disease (valvular insufficiency, venous hypertension, etc.), is associated to more or less latent or manifest lymphostatic pathology of such severity to contraindicate a lymphatic-venous shunt, reconstructive lymphatic microsurgery techniques have been developed (autologous venous grafts or lymphatic-venous-lymphatic-anastomoses - LVLA). Objective assessment was undertaken by water volumetry and lymphoscintigraphy. **Results.** Subjective improvement was noted in 87% of patients. Objectively, volume changes showed a significant improvement in 83%, with an average reduction of 67% of the excess volume. Of those patients

followed-up, 85% have been able to discontinue the use of conservative measures, with an average follow-up of more than 10 years and average reduction in excess volume of 69%. There was a 87% reduction in the incidence of cellulitis after microsurgery. **Conclusion.** Microsurgical lymphatic-venous anastomoses have a place in the rehabilitative treatment and prevention of peripheral lymphedema and should be the therapy of choice in patients who are not sufficiently responsive to nonsurgical treatment. Improved results can be expected with operations performed earlier at the very first stages of lymphedema.

Guideline for outpatients treatment

D. Corda

Istituto Fisiokinesiterapico di Casteggio (PV), Polimedica San Lanfranco-Pavia

Introduction. Outpatient treatment is the most frequent treatment for lymphedema patients in Italy. There are important differences between the various rehabilitative facilities. There are physiotherapeutic practises, with a single physiotherapist, medical practises, with a single medical doctor, and there are Rehabilitative Medical Centres with a complete *Rehabilitative Team*. Outpatient Rehabilitative Institute next to or into a Hospital, with regard to the results and, above all, to the safety of all kind of patients, is the optimal condition. **Materials and methods.** The treatment practised into Outpatient Clinics or Outpatient Medical Centres results ideal to carry out preventive measures/planes and individual rehabilitative programs of decongestion (CDP-1) in patient with early or intermediate stages of oedema without systemic complications and serious associates diseases. Outpatient Rehabilitative Centre is also ideal for treatments in maintenance planes (CDP-2). **Results.** Outpatient treatment is very difficult for patients that live far from Rehabilitative Centres and for not self-sufficient patients. For these patients and for seriously and critically ill patients, affected by polipathologies like cardiorespiratory and hepato-renal diseases or several infections (sometimes antibiotic resistant) the hospitalization is ideal and safe choice. **Conclusion.** The most important thing is the experience of the lympho-rehabilitative team anyway and, as usual, a lot of wisdom.

Lipo-lymphedema rehabilitation

E. Földi

Földiklinik, Clinic for Lymphologie, Hinterzarten, Germany

Introduction. The clinical picture of lipedema/lipo-lymphedema is well known: symmetrical, progressive increase of adipose tissue, mostly on the lower extremities of women, resistant to diet. It takes a course in stages which can be distinguished from each other, both by their clinical picture and their histological characteristics. **Materials and methods.** Lipedema/lipo-lymphedema is characterized by an edema of an increased adipose tissue triggered by a disturbance of blood capillary permeability. Both the clinical and the histological picture distinguish lipedema/lipo-lymphedema from other localized increases of adipose tissue. Combination lipedema and obesity, as well as lipedema and lymphedema, occur often. Established pathophysiological knowledge of lipedema/lipo-lymphedema: increased permeability and fragility of blood capillaries; increased permeability of lymph capillaries; aneurysma-like structures of lymph vessels. These alterations are responsible for the edema and hematomas. Lymphangiomotoric activity is disturbed. The compliance of the skin is increased, the veno-arteriolar reflex is missing: as a consequence the effectiveness of the calf pump is decreased. **Results.** What concerns the role of the lymph vascular system in lipedema/lipo-lymphedema: lymphoscintigraphic findings vary with the stages. It's very important to differentiate between lipedema/lipo-lymphedema and the fatty leg of the healthy woman. This can be done either by blood capillary scintigraphy, performed by Behar in France, or, what we use, the water-loading test of Streeten. **Conclusion.** The treatment of choice of lipedema/lipo-lymphedema is combined physical decongestion (CDP). If the diagnosis is established, according to strict criteria, one should abandon liposuction, because it doesn't influence the pathophysiological alterations. In a clinical study, performed on patients suffering from lipedema/lipo-lymphedema we have found that phase I of CDP is effective: during phase I the volume reduction of the legs is highly significant. In patients with good compliance (healthy life way, consequent compression therapy) the long term results are after 4 years

are satisfying. Further research on the pathophysiology of lipedema/lipo-lymphedema is necessary.

References

Foldi M., Foldi E., Kubik S.: Textbook of lymphology. Elsevier. Munich 2005.

Elastocompression in breast-cancer related lymphoedema (BCRL)

I. Forner-Cordero

Lymphedema Unit. Hospital Universitario La Fe. Valencia (Spain).

Introduction. Too few studies are performed on the effects of elastocompression in the maintenance-phase-patients with BCRL. Our goal was to design a score of compression garments suitability to see what happening at long time in the volume of the limb, performing a descriptive analysis of the fitting. **Materials and methods.** We studied 130 maintenance-phase-patients (128 had armsleeves and 100 had gloves). We used a score table designed by us, which gave us a comparable final score. The armsleeves was used for a mean of **11.4** hours per day, and gloves **7** hours per day. The volume change was calculated, from baseline, at 1st, 6th and 12th month. The garments deterioration was recorded. **Results.** The volume, calculated with the Kuhnke formula, decreases at 1st month (a mean of -1.6% (95%CI:-2.6 to -0.3), returns to baseline after 6th month (0.0% (95%CI:-1.0-2.0) and increases after 12th month (1.5% (95%CI:-0.4-3.5). The volume after 6th month increased more in severe stages of lymphoedema (p=0.005). No relation was found between the volume at 1st month and the time of using garments. High score was related to a lower increase of volume after 6th and 12th month. Patients with or without hand swelling wore the garment for a mean of **8.4** or **11.9** hours per day. The patient's satisfaction was good or excellent in about 80% of cases. **Conclusion.** The use of a suitable garments seems to be effective for maintaining the volume of the arm after 6th and 12th month. The armsleeve plays an important role at long time, but deteriorated. The hand swelling and the patient's satisfaction are the main factors influencing the use of the compression garments.

References

Forner-Cordero I, Albiach-Gascó L, Maldonado-Garrido D, Muñoz-Langa J. A new method to assess garment's suitability in post-mastectomy lymphedema. Eur J Lymphol Relat Probl. 2008;18(53):11-5.

Physical treatment of phlebolymphoedema: european consensus

O. Leduc, A. Leduc, Lympho-Phlebology Unit.

Hte Ecole P.H.Spaak Brussels

Introduction. The commonly oedematous recognized situations are defined as following: the oedema is slight when the size is less than 20% difference from the normal. The oedema is moderate when the size is between 20 and 40 % different from the normal and it is severe when the size is more than 40 % greater than normal. **Materials and methods.** The physical treatment of a slight oedema is limited to manual lymphatic drainage (MLD) applied 3 to 5 times a week for 2 to 3 weeks followed by reducing the frequency of the sessions until the end of the treatment. The physical treatment of moderate or severe oedema is proposed according to several stages. During the first stage, the treatment consists in MLD, intermittent pneumatic compression (IPC) and multilayer bandages (MLB). During the second stage, MLD, IPC and compression garments are proposed. The physical treatment is started daily for 3-4 weeks and the frequency is progressively reduced to eventually once a week. **Results.** The physical activity is adapted to the patient during and after the physical treatment: some exercises promote the lymph drainage and the venous drainage and participate to the reduction of the oedema. **Conclusion.** The different stages are illustrated on the basis of fundamental and clinical investigation

Priority in therapeutic strategies

S. Michelini, A. Failla, M. Cardone, G. Moneta, A. Fiorentino, F. Cappellino

San Giovanni Battista Hospital, Rome, Italy

Introduction. Physical treatment is basilar in primary and secondary lymphoedema. Define the kind of patient is important to

address the proper tailored treatment. **Materials and methods.** We studied 372 patients suffering from lymphoedema (221 females and 151 males, range age from 8 to 79 years, 149 with primary lymphoedema and 223 with secondary). In patients able to perform an adequate muscular exercise distributed during the day (group A), we added to the MLD a multilayer anelastic bandaging, associated to the proper exercises for the calf pumps. In less able patients (group B), more open to the passive therapy, we associated to the MLD the sequential pneumatic therapy and monolayer elastic bandaging. We used ultrasounds-waves to reduce tissutal fibrosis (2 watt/cm², 1-3 MHz, 12-15') and shock-waves too (1000-3000 blows, 1-2,5 atm). In all patients was performed an occupational therapy to better address the intentional exercises involving the various muscular masses of interested limbs. **Results.** On the 3th week-follow up we observed: an average decrease of the limb circumference (in group A a mean of 37% and in group B a mean of 26% respect to the basilar conditions); decrease of tissutal consistence, above all in the area of major localization of fibrosis; recovery of muscular tropism and strength; increase of articular function. **Conclusion.** The study demonstrates the importance of the rational use of physical system of drainage (manual and mechanic) to obtain best clinical results in each clinical case.

References

Michelini S., Cardone M., Failla A., Moneta G., Fiorentino A., Cappellino F.: Geriatrics lymphedema: priority in therapeutic choices. *BMJ Geriatrics* in press

Combined treatment of lymphoedema: the best place for each partner in a real team

A. Pissas, R. Rubay, E. Prieur, M. Adriaens.

Department of surgery and Unit of treatment of edema, General hospital Louis Pasteur, 30200 Bagnols sur Cèze France.

Introduction. According to their experience of physical treatment of edema since 28 years, with a precise strategy, the authors report their statistical cases and particularly the different techniques of treatment worldwide (analytic study). But they essentially underline their own conception of the synthetic treatment: which is the precise mission of each partner and where treat the patient to avoid detrimental challenge? They think that there are three steps in the therapeutical evolution of the patient. Those three steps are associated but for each patient the program could be different. **Materials and methods.** *1-First:* the unit of treatment of edema: a peculiar lymphology center with a medical and physiotherapeutical staff. Intensive treatment is done one, two, or three weeks. That represents a "debulking" treatment, but also a conservative one. *2-Second:* during all the life a lymphoedematous patient must be treated without any interruption: one or two times the week by LMD, exceptionally pneumatic drainage, multilayer bandages and elastic stockings. This must be done by a lymphologist physiotherapist. The patient takes conscience that it is a chronic disease. *3-Third:* it is represented by the own investment of the patient himself in the therapeutical plane. Elementary recommendations must be respected to avoid aggravation of the swollen limb. **Results.** Over these three fundamental steps an important role is played by the psychological position of the patient, the disability, the handicap and the alteration of his image and the consequences on the quality of life assessed by a specific scale. **Conclusion.** The collaboration with psychologists is of prime importance in this scheme. For this specific alteration of image body is not supported by a specific scale of quality of life. The lymphologist has to explain very carefully and many times concept of "spending time to his lymphoedema".

Evidence Based Medicine in the Diagnosis and Management of Hand Osteoarthritis

Fitnat Dincer

Hacettepe University Faculty of Medicine Dept of PRM Ankara/Turkey

Introduction. In this abstract, especially the Diagnosis and Management of Hand Osteoarthritis (HOA) will be mentioned depending essentially on the recent Evidence Based Recommendations and literature. **Materials and methods.** Evidence based Recommendations for the "Diagnosis of Hand Osteoarthritis (HOA)" according to topic (risk factors, clinical, subsets, differential diagnosis, images and laboratory tests) will be mentioned in details with Levels of Evidence. Also Evidence Based Recommendations for the "Management of HOA" developed through three Delphi rounds

, according to the following topics: general, non-pharmacological, pharmacological, invasive, surgical, with Levels of Evidence will be given through the lecture. **Results.** The results of 3 Delphi rounds, 108 literature for Diagnosis and 309 literature for Management of Hand OA depending on Evidence Based Medicine and Evidence Hierarchy with Levels of Evidence will be presented. **Conclusion.** Pain relief and restoration of function remain the primary treatment objectives. These are best achieved by a combination of pharmacological and non-pharmacological treatment especially by application of physical and rehabilitation medicine procedures. Surgery remains the last resort for restoration of function if all else fails

References

1. Zhang W, Doherty M, Leeb BF, Alekseeva L, Arden NK, Bijlsma JW, Dincer F, et al. Evidence Based Recommendations For Diagnosis of HOA. *Ann Rheum Dis* 2009;68:8-17.
2. Zhang W, Doherty M, Leeb BF, Alekseeva L, Arden NK, Bijlsma JW, Dincer F, et al. Evidence Based Recommendations For The Management Of Hand Osteoarthritis. *Ann Rheum Dis* 2007;66:377-388
3. Zhang W, Moskowitz RW, et al. OARSI recommendations for the management of hip and knee OA, OARSI evidence-based, expert consensus Guidelines. *Osteoarthritis and Cartilage* 2008;16:137-62.

Course and Prognosis of Neck Pain in the General Population, in Workers and in Whiplash-Associated Disorders (WAD)

L. Carroll

Senior Health Scholar, Alberta Heritage Foundation for Medical Research, Professor, Department of Public Health Sciences, Associated Research Scientist, Alberta Centre for Injury Control and Research (ACICR), University of Alberta, Edmonton, AB, Canada

Background. Given the endemic nature of neck pain, we need to understand the course of neck pain and determinants of that course. **Materials and methods.** The *Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders* (Neck Pain Task Force) carried out a systematic search, critical review and best evidence synthesis of the existing literature on the course and prognostic factors for neck pain. **Findings:** We found 226 studies related to course and prognostic factors of neck pain and 70 passed the critical review process. Our findings are based on these. In the general population, 50-85% of those with neck pain will report neck pain 1-5 years later, with similar frequencies in workers and in children. Likewise, approximately 50% of adults with WAD will report symptoms one year post-crash. Evidence is mixed on the prognostic role of gender. Younger ages have better prognosis in the general population, but not in workers, and evidence is mixed in WAD. In the general population and workers, prior pain, poor prior health, and comorbid back pain predict less neck pain recovery. Evidence for these factors is mixed in WAD. Workplace factors and collision factors appear to have little prognostic role in neck pain recovery, although preliminary evidence (limited by few studies) suggests that when crash speed is measured using a crash recorder, higher speeds predict poorer recovery. There is strong and consistent evidence that self-reported initial symptom and pain severity, and that psychological factors (e.g., coping, distress) predict poorer neck pain recovery in the general population and WAD. **Conclusion.** Neck pain is frequently recurrent or persistent in children and adults in the general population, in workers and in those with WAD, although most do not experience long-term disabling symptoms. Prognostic factors for recovery are multidimensional.[1,3,4,2]

References

1. Carroll LJ, Cassidy JD, Peloso PM, Giles-Smith L, Cheng CS, Greenhalgh S, Haldeman S, van der Velde G, Hurwitz EL, Côté P, Nordin M, Hogg-Johnson S, Holm LW, Guzman J, Carragee EJ (2008). Methods for the best evidence synthesis on neck pain and its associated disorders. *The Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine* 33:S33-S38
2. Carroll LJ, Hogg-Johnson S, Côté P, van der Velde G, Holm LW, Carragee EJ, Hurwitz EL, Peloso PM, Cassidy JD, Guzman J, Nordin M, Haldeman S (2008). Course and prognostic factors for neck pain in workers. *Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine* 33:S93-S100
3. Carroll LJ, Hogg-Johnson S, van der Velde G, Haldeman S, Holm LW, Carragee EJ, Hurwitz EL, Côté P, Nordin M, Peloso PM, Cassidy JD, Guzman J (2008). Course and prognostic factors for neck pain in the general population. *Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine* 33:S75-S82
4. Carroll LJ, Holm LW, Hogg-Johnson S, Côté P, Cassidy JD, Haldeman S, Nordin M, Hurwitz EL, Carragee EJ, van der Velde G, Peloso PM, Guzman J (2008). Course and prognostic factors for neck pain in whiplash-associated disorders (WAD). *Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine* 33:S83-S92

Clinical view on ambulation in patients with Spinal Cord Injury

S. Moslavac

Spinal Unit, Special Medical Rehabilitation Hospital, Varazdinska Toplice, Croatia

Spinal cord injury (SCI) results in multisystem dysfunction including various levels and severity of paralysis. Among many other losses and however difficult to achieve, ambulation is usually among primary wishes of SCI patients and the symbol of regaining control of former lifestyle. From the clinical view it is only one in a series of limitations imposed by injury but also one of the most difficult to overcome. Assessment of ambulation potential starts with standard neurological classification of SCI for lesion level and ASIA (American Spinal Injury Association) impairment scale for lesion completeness, including LEMS (Lower Extremity Motor Score). Rehabilitation interventions towards verticalisation should follow gradual training scheme, from tilt-table exercise and standing frames to use of walkers and braces in selected patients, where ambulation can achieve functional gains. Besides kinesiotherapy and hydrokinesiotherapy for posture, balance, range of motions, strengthening and gait training, the use of functional electro stimulation, bracing, treadmill and isokinetic exercises represent added value to the programme. In rehabilitation, ambulation goals must be carefully set and realistic to prevent further injury (e.g. neuroarthropathy). Once achieved it should be measured by standardized outcome measures as are Walking Index for Spinal Cord Injury (WISCI), 10-m walk test (10MWT), and 6-min walk test (6MWT). PRM specialist in charge of SCI rehabilitation must be experienced and knowledgeable to assess and lead gait training in SCI patient who may profit from it, but also to direct rehabilitation goals away from ambulation efforts if it is not achievable for patient.

Action observation in the Rehabilitation of post acute Stroke and its origin in the concept of mirror neurons: preliminary data of RCT

M. Franceschini on behalf of NESPERIA

Neuro-Rehabilitation Department, IRCCS San Raffaele, Pisana, Rome (Italy)

Introduction. The recovery of arm function in patients with a stroke presents limited results. The activity of upper limb at discharge from Rehabilitation after post-acute phases is normally poor: only a range from 5% to 20% of patients presenting an upper limb paralysis at onset may improve the motor impairment over time. Recent studies demonstrated the presence in the human pre-motor area of mirror neurons with the property to discharge during the observation of hand/arm actions. The aim of the research was to evaluate if the observation of arm actions may constitute an alternative rehabilitation strategy in post-acute stroke patients. **Materials and methods.** A RCT included 102 patients (53 EG., 49 CG) at the first acute stroke (30 ± 3 days from stroke). All subjects had received a conventional rehabilitation treatment and in addition the patients included in EG were asked to watch filmed sequences showing upper limb daily activities, while CG in addition watched a static image without animals movement. Assessments were taken with the following: Fugl Meyer, Frenchay Arm Test, Box and Block (B&B), Barthel Index and FIM administered before (T0) and after the treatment (T1) and at follow-up (T2). **Results.** After adjusting for baseline scores and age, the preliminary analysis demonstrated a significant improvement in all parameters in both groups from T0 to T1 ($p < 0.001$) and from T0 to T2 ($p < 0.001$). Furthermore, a significant "time for treatment" effect was shown in the B&B Test, favouring an higher impact of Experimental treatment on upper limb recovery ($p < 0.001$). **Conclusion.** This new rehabilitation approach consents a good result as with a traditional treatment. The EG may reveal useful in promoting motor dexterity recovery in the post-acute phase of stroke. This data could suggest that it could be a possibility to stimulate the mirror neurons after stroke. It needs more research with fNMR or Neurophysiology assessment to confirm this possibility.

Early Rehabilitation in haemiplegic patients

M. Mandić¹, M. Spalević¹, N. Ranaić²

¹Clinic for rehabilitation and physical medicine, Clinical Center Niš, Serbia

²School of medicine Niš, Serbia

Introduction. Stroke rehabilitation therapy begins in the intensive-care unit after the patient's medical condition has been stabilized, often within 24 to 48 hours after the stroke. The objective of the paper was to compare the results of stroke rehabilitation in hemiplegic patients who had the thromboembolic stroke with those who had hemorrhagia. **Materials and methods.** The prospective cohort study was done. The study involved 114 (61 men and 53 women) hemiplegic patients. Functional status was assessed by Barthel index and it was determined at rehabilitation admission, and at discharge. The first steps involve promoting independent movement because many patients are paralyzed or seriously weakened. "Passive" range-of-motion exercises are those in which the therapist actively helps the patient move a limb repeatedly, whereas "active" exercises are performed by the patient with no physical assistance from the therapist. To determine the etiology of the stroke computerised tomography was used. **Results.** Seventy nine (69.3%) strokes were thromboembolic and thirty five (30.7%) were hemorrhagia. The score of Barthel index before the onset of rehabilitation was 65.7 for the patients who had thromboembolic stroke and those who had hemorrhagia, the score of Barthel index was 35.8. When rehabilitation was finished the Barthel index score was 88.8 for the patients who had thromboembolic stroke and for those who had hemorrhagia it was 64.2. The difference which was found is significant statistically ($t=3.254$ and $p=0.042$). **Conclusion.** According to the presented results we can conclude that the patients who had the thromboembolic stroke had better functional recovery compared with the patients who had hemorrhagia.

References

1. Paris T. Stroke rehabilitation. *Northeast Florida Medicine* 2007;58(2):26-29.
2. Dobkin B. Rehabilitation after stroke. *N Engl J Med.* 2005;352:1677-1684.

Adaptational changes in the dominant shoulders of female competitive overhead athletes

K. Tonin¹, K. Stražar², G. Vidmar¹, H. Burger¹

¹University Rehabilitation Institute, Republic of Slovenia

²Dept. of Orthopaedic Surgery, University Medical Centre Ljubljana, Republic of Slovenia

Introduction. A cascade of adaptational changes such as GIRD, symptoms of SICK scapula syndrome and muscular imbalances develop in dominant shoulders of overhead athletes and represent a shoulder at risk. **Materials and methods.** Participants were 36 competitive female overhead athletes (21 handball players and 15 volleyball players), divided in 2 groups by symmetry of hand-use. They all completed Kateri? questionnaire, detailing shoulder injury and pain. Clinical examination of the shoulders was performed, including SICK scapula syndrome signs, passive internal (IR) and external rotation (ER) and GIRD evaluation. Isokinetic testing of IR and ER was performed in concentric (c) and eccentric (e) mode at two testing speeds (60°/s, 150°/s). Fatigability of IR and ER was measured. Stability spiking (eER/cIR) and cocking ratios (eIR/cER) were calculated. **Results.** All players showed decreased IR and increased ER ROM in dominant shoulder ($p > 0.001$). Average GIRD was 20.6°, greater GIRD was correlated with higher cIR peak torques ($p=0.026$ and $p=0.008$). Players with increased ER and more SICK scapula syndrome signs had lower eIR peak torques and hence lower cocking ratios ($p=0.019$, $p=0.035$ and $p=0.04$). Dominant hand eER peak torques were lower, hence the spiking ratios were lower ($p=0.002$ and $p=0.006$). Players with previous injury showed more scapular abduction, increased ER and lower cocking ratios ($p=0.023$). Setters, goalkeepers and libero (symmetrical hand-use) had lower fatigability of IR and ER ($p=0.019$ and 0.01). **Conclusion.** Static and dynamic adaptational changes were found in dominant shoulders of participants (decreased IR, increased ER, GIRD, SICK scapula, muscular imbalances) which were directly correlated to the history of injury. Hitters and throwers showed more fatigability of IR and ER, probably due to higher percentage of type 2 muscle fibers. Because of delicate balance between shoulder mobility and stability, and adaptational changes and injury of the shoulder, preventive training is paramount for overhead athletes.

References

1. S.D.Krishnan, R.J.Hawkins, R.F.Warren. The shoulder and the overhead athlete. Ed. Lippincott Williams&Wilkins, 2004.
2. S.S.Burkhardt, C.D.Morgan, W.B.Kibler. The disabled throwing shoulder: Spectrum of pathology. Part I: Pathoanatomy and biomechanics. Part II: Evaluation and treatment of SLAP lesions in throwers. Part III: The SICK scapula, scapular dyskinesis, the kinetic chain, and rehabilitation. *Arthroscopy.* Vol 19, Nr. 4; 2003: 404-20. Vol 19, Nr. 5; 2003: 531-9. Vol 19, nr. 6; 2003: 641-61.

Do Clinical Measures of Maltracking Correlate to Weight Bearing Patellofemoral Joint Orientation from MRI?

H. Collado^{1,2}, J-M. Viton¹, A. Delarque¹, T. Besier², M. Fredericson²

¹Department of Physical Medicine & Rehabilitation, University Hospital, Marseille, France

²Division of Physical Medicine & Rehabilitation, Department of Orthopaedic Surgery, Stanford University School of Medicine, Stanford, California, USA

Introduction. Clinical assessment of patellar malalignment is important for the diagnosis and treatment planning of patellofemoral (PF) pain. The purpose of this study was to determine if Q-Angle and hip IR range of motion correlate to lateral displacement and tilt of the patella during a weight-bearing squat. **Materials and methods.** Eight patients with PF pain performed a static squat to 60° of knee flexion in a 0.5T GE Signa SP open-bore Magnetic Resonance scanner. Surface meshes of the femur and patella were created for each patient from a high resolution (1.5T) SPGR MRI scan and registered to the weight-bearing images using an iterative closest point algorithm. Anatomical landmarks were identified on each mesh and patella tilt and lateral displacement was calculated with respect to the femoral coordinate system. An experienced

sports medicine physician measured QAngle and passive range of hip internal rotation for each patient using a hand-held goniometer. Clinical measures were compared to patella tilt and lateral displacement using a Pearson Product-Moment correlation. **Results.** Q-Angle accounted for 57% of the variance in lateral displacement of the patella and showed a trend towards significance correlating to patella tilt. Hip IR range of motion correlated poorly with lateral displacement but approached significance for variations in patella tilt. **Discussion.** Although only a small number of patients have been analyzed to date, these data support the notion that Q-Angle is related to an increase in lateral patella displacement during a functional, weight-bearing task. It was somewhat surprising to see this simple, non-weight bearing metric account for as much as 57% of the lateral displacement of the patella. These preliminary findings support the use of the Q-Angle as a clinical measure that correlates to patella tilt and displacement during a weight-bearing squat. The question remains to what degree of tilt or amount of displacement is considered 'abnormal' or at risk for the development of PF pain. Increasing the number of subjects in this analysis might also reveal a significant relationship between Q-Angle and hip IR with patella tilt.

References

1. Gold G. et al (2004). JMRI, 20, 526-30.
2. Zhang Z. (1994). Int J Comp. Vision, 13, 119-152.

Authors' Index

A

- Abad Fernández C., 96
 Abaitua Ezquerro M.P., 176., 207
 Abbruzzese G., 191
 Abdel Ghani H.M., 66
 Abdul-Wahab T., 43
 Abreu de Sousa J., 188
 Abriani S., 230
 Abundo P., 240
 Achenbach S.J., 128
 Achmawi G.A., 66
 Acito R., 150
 Acler M., 71
 acomussi T., 251
 Actis M.V., 124
 Actis M.V., 124
 Adamczyk L.M., 67
 Adami S., 96
 Adriaens M., 278
 Afonso C., 87
 Aggeli V., 78, 84, 97, 148
 Agostini M., 41, 160
 Agre M., 167
 Agudoa A.G., 48
 Ahadi T., 56, 165
 Ahadi T.
 Ahlborg Jr G., 252
 Ahmad Al-Khayer., 260
 Aimonino Ricauda N., 198
 Akarirmak U., 104, 133
 Akbari M., 15
 Akcar Degirmenci N., 190
 Akgün K., 247
 Akkus S., 85
 Akyuz G., 141, 215
 Al Hamadi Y., 42
 Alaca R., 188
 Alava Menica A., 176
 Alavi S., 214
 Albayrak Aydin N., 3, 65
 Albertazzi R., 48
 Alberti G., 225
 Albertini G., 73, 147, 157
 Alcuri R., 152, 153
 Aldegheri R., 96
 Alfano A., 138
 Alferova V., 213
 Ali, G., 18
 Alipour A., 139
 Al-Jarrah M., 42
 Al-Khateeb A., 42
 Al-Khayer A., 65, 151, 152, 154
 Allard E., 57
 Alloro M., 257
 Allsop M.J., 123
 Almajan-Guta B., 158, 257
 Almajan-Guta V., 183, 257
 Almeida A., 211
 Almeida J., 203, 246
 Al-Mustafa M.M., 217
 Alokairinou K., 179
 Alptekin K., 59
 Altini S., 127, 140, 254
 Alvarez Sala M., 134
 Aly W., 67
 Alzate M., 120
 Amabile E., 243
 Amado A., 163
 Amaricai E., 38
 Amato A., 198
 Ambrosi C., 76
 Ambrosone M., 24., 30
 Amelio I., 89
 Amendola G.A.M., 217
 Amico A.P., 248
 Amier-rajab S., 69
 Amin S., 128
 Aminian K., 252
 Amorim P., 246
 Amorim S., 106, 120, 163, 171
 Amoruso L., 116, 117, 129
 Amoruso M.T., 116, 117
 Ananidis N., 174, 179
 Andersson M., 216
 Andor B., 169
 Andreatta S., 106
 Andrei D., 38
 Andreoli E., 225
 Andretta E., 22, 23, 45
 Andringa A., 191
 Angelelli P., 97
 Angelova A., 202
 Anglani S., 270
 Anicic S., 213
 Annaratone G., 81
 Annaswamy T., 101., 235
 Annino G., 48, 192
 Ansevini R., 175
 Antonaci A., 162
 Antoniono E., 198
 Anttonen T., 197
 Anwar F., 151, 152., 154
 Aprile I., 109, 111, 112, 114, 167
 Araújo V., 84
 Arbosti G., 258
 Arcangeli C.A., 48
 Arcangeli E., 225
 Archanco Olcese M., 228, 142
 Archilletti A., 223
 Arellano M., 77, 121, 122
 Arena N.A., 109
 Arioli G., 254
 Arleo M., 123
 Armagan O., 189
 Armaganidis A., 55
 Armakola F., 201, 274
 Armani M., 256
 Armenteros-Pedrero J.G., 118
 Arnoldo M., 106
 Arokoski J.P.A., 197
 Arsic J., 213
 Arsic V., 208, 209
 Artuso G., 45
 Aseiaei H., 69
 Ashraf A., 37, 38
 Ashraf A.R., 36, 40
 Ashraf M.H., 37
 Assiabi H., 196
 Astolfi N., 125
 Asuman D., 263, 264
 Atabas E., 100
 Ataman S., 77
 Atkinson E.J., 128
 Attisani G., 84
 Aubée C., 55
 Aučynienė L., 136
 Aul E., 59
 Aulisa A.G., 243
 Aulisa L., 243
 Ausenda C.D., 49
 Ausin M.P., 183
 Auwaidat Z., 78
 Avdyunina I., 91, 213
 Aventaggiato C., 262
 Aversa C., 161
 Avesani R., 122, 201, 203, 266
 Avram A., 85, 115, 142, 145, 146, 247
 Avram C., 115, 133, 142, 145, 146, 158, 183
 Avram C., 85, 247, 257
 Avram C.A., 85, 158
 Ay S., 61, 171, 172
 Aydin N.A., 32, 66, 141
 Azadeh H., 59
 Azevedo M.J., 211, 215
 Azhdarnia N., 38
 Azouvi P., 5
B
 Baba A., 41
 Bacchini M., 44
 Bacci L., 148, 150
 Badtieva V., 250, 260
 Bagni E., 150, 151
 Bahrami M.H., 162
 Bahrpeyma F., 16
 Baiano C., 172
 Baiardi P., 70
 Baietta S., 63
 Baio R., 242
 Bak P., 34
 Bakalli A., 4
 Bakas E., 201, 274
 Baker A., 46
 Bhakta B.B., 60
 Bakhtiary A.H., 50
 Balaban B., 188
 Balaban S., 108
 Baldassarre S., 232
 Baldassarre V., 181, 182
 Balestreri P., 264
 Ball, A.K., 175
 Balthazard P., 192
 Balugani L., 216
 Bandinelli S., 53
 Baños A., 206
 Banu K., 188, 199
 Barassi G., 262
 Baratto L., 164
 Barbano A. 92., 198
 Barbera G., 102, 103
 Barberá Loustaunau M., 176
 Barbieri M., 70., 81
 Barca-Fernández I., 177
 Barca-Fernández I., 142., 177, 228
 Bardak A., 161
 Bargellesi S., 97, 177, 217, 218
 Bar-Haim S., 252
 Barletta V., 105
 Barnola E., 174
 Baroni M., 95
 Baroselli S., 121
 Barotsis N., 174
 Barotsis Ö., 179
 Barreira A., 108
 Barros P., 218
 Barroso L., 164
 Barroso L., 167
 Bartalini B., 226
 Bartolozzi P., 96
 Baruzzi E., 180
 Barzu M., 158
 Basaglia N., 216, 249, 253
 Bascarevic Z., 253
 Bassett D.N., 223
 Bassi E., 224
 Battaler-Peñafiel E.G., 269
 Batocchi A.P., 113
 Battaglia M.A., 132
 Battista P., 231
 Battistelli G., 114
 Battistelli V., 175
 Baydova T., 237
 Baygatalp F., 155
 Baykal T., 197
 Bazzana A., 177, 218
 Beatrice M., 134, 256, 257
 Beça G., 246
 Bedodi L., 275
 Bejor M., 94
 Belicza E., 246
 Bellaviti G., 275
 Belloglio P., 118
 Bellomo R.G., 261, 262, 263
 Bellone E., 191
 Belloni V., 216
 Bellora A., 82
 Belmonte Martínez R., 77
 Beltrán Neus G., 90
 Ben Salah F.Z., 58
 Ben Salah Frih Z., 214, 215
 Ben salah S., 184
 Bendinelli M., 160
 Benedetti M., 52
 Benedetti M.G., 124
 Bensoussan L., 249
 Bentin S., 220
 Bentivoglio A., 113
 Benyahya R., 107
 Berberog'lu N., 126
 Berceanu-Vaduva D., 142
 Berdnikovich E., 91
 Bergamasco M., 123
 Bergamin F., 228, 251
 Berges L.M., 14
 Beril D., 188
 Beris A., 54

INDEX

- Berisha M., 59
 Berlingieri C., 185
 Bernardini ., 48, 192
 Bernardini B., 123, 191
 Bernasconi K., 128
 Bernatavičius J., 137
 Bernucci C., 224
 Bertagna M., 96
 Berthoz A., 226
 Berti L., 124
 Bertini M., 128
 Bertocchi A., 249
 Bertocco P., 56
 Bertolini C., 243, 244
 Bertolini T., 235
 Bertuccelli L., 71
 Bertuletta S., 269
 Bešić N., 95
 Besier T., 280
 Bessonov A.E., 10
 BestaVashvili L., 94
 Bet C., 63
 Betti N., 199
 Bettini P., 273
 Betto A., 183
 Bettoni M., 224
 Bhakta B., 74, 123
 Bhakta B.B., 60
 Bhupinder Panesar., 260
 Biacchi D., 196
 Bianchi A., 226
 Bianchi C., 183
 Bianchini D., 96
 Bianconcini F., 225
 Biasutti E., 91, 125, 130
 Bica A., 135
 Bigatti B., 131
 Bighea A., 98, 163, 205
 Bighea A.C., 54, 56
 Bikaki E., 228
 Bilgin S., 160
 Bilotta V., 89
 Biotto E., 183
 Bisogno M.R., 230
 Bissolotti L., 180
 Bivona U., 97
 Bizzarini E., 101
 Blakaj I., 50
 Blok R., 191
 Bo Young H., 75
 Bobrovnicshiy I., 249
 Boccardo F., 276
 Bocin E., 238
 Bocker B., 34, 36
 Bocker R., 36
 Bodini G., 258
 Bogdanovic D., 208
 Bogdanovic D., 25
 Bohy D., 7
 Boisgontier M., 43
 Boldrini P., 177, 218
 Boldrini P., 266
 Boldt C., 209, 211
 Bollens B., 104
 Bolognari M.A., 71
 Bombace V., 175
 Bombace V.G., 174, 176
 Bona S., 245
 Bonacini P., 230
 Bonaiuti D., 89, 95, 258
 Bonaldo L., 255, 256
 Bonamartini A., 207
 Bonato P., 216
 Bonetti P., 52, 160
 Bonezzi C., 70
 Bonfiglio L., 123
 Bonghi L., 117
 Boni M., 71
 Bonikowski M., 184
 Bontoux L., 51
 Borda I.M., 202
 Bordieri C., 109
 Borges J.A., 164
 Borghi S., 135, 224
 BorideFortuny I., 166
 Borland S., 99, 266
 Borman P., 66, 72, 257
 Boros E., 55, 246
 Borrelli N., 71
 Boscarino S., 215
 Boschi M., 124
 Boscolo A., 160
 Boscolo Bozza L., 76
 Bossi D., 129
 Bottazzi A., 244, 245
 Bottura E., 84
 Bouchema T., 107
 Boudoukhane S., 214, 215
 Bouron C., 35
 Bove M., 191
 Bovio G., 129
 Bovolenta F., 88, 89
 Bowman M., 28
 Boyvat A., 171
 Boza Gómez R., 77
 Boza R., 120, 183
 Bozzo V., 222
 Bracali A., 150, 151
 Bracke P., 225
 Bradaschia E., 78, 119
 Braga S., 179
 Brailescu C., 57, 193
 Brailescu C.M., 192, 193, 194
 Bramucci S., 145
 Brancaccio S., 267, 268
 Branco J., 190, 246, 263
 Branea H., 101, 102
 Braverman D.L., 67
 Brdar R., 21
 Brdarski Z., 4, 6, 213
 Breda C., 65
 Brenneis C., 222
 Brescacin C., 97
 Breschi M., 150, 151
 Bressan A., 90
 Bressan S., 255
 Brianti R., 230
 Brichetto G., 131, 132
 Briganti A., 230
 Briganti G., 212
 Brigatti E., 129
 Broccatelli M., 243
 Broccoli P., 48
 Bronzini G., 131
 Brueggemann S., 7
 Brugnoni G., 181
 Brun C., 241
 Brunani A., 42
 Bruneau A., 51
 Brunelli S., 145
 Bruni L., 244
 Brykczynski M., 92
 Brzeziński A., 92
 Bubbico L., 167
 Bučma T., 108
 Bucci Brucato P., 263
 Bueno R., 235
 Bugorsky E.V., 3
 Bühlmann P., 17
 Bula C., 252
 Bulgheroni M., 252
 Bumbaa A.M., 163, 205
 Buonanno G., 264
 Buonocunto F., 228, 229
 Buoso S., 23, 41
 Burelle Y., 108
 Bürge E.E., 8
 Burger H., 44, 95, 279
 Burrus C., 211
 Buschmann-Steinhage R., 7
 Buselli P., 265
 Bussmann J.B.J., 252
 Bytyci C., 59
 Bytyçi C., 67
C
 Čukanovic M.P., 158
 Cacchio A., 2, 5
 Caiazzo A., 128
 Caimac D., 98
 Cajigas I., 216
 Cakar E., 141, 215
 Cakit B.D., 54
 Calabrese A., 218
 Calabrese C., 200
 Calabretto C., 180
 Calamari M.L., 143
 Calasso M., 24
 Calcarella G., 223
 Calderisi E., 207
 Calderon Padilla V., 233
 Calegari M., 256
 Calero E., 80, 164
 Caliendo P., 110, 111, 113
 Çaliş H.T., 126
 Çaliş M., 126
 Callegaro M., 260
 Callistri M., 118
 Camelo A.P., 170
 Camelo Pinto A., 212
 Camerota F., 110, 111, 112, 157
 Camões A., 141
 Campa I., 111
 Campanini I., 230
 Campi F., 26
 Campioni M., 71
 Campisi C., 276
 Campo C., 22
 Camporeale A., 140, 270
 Camurri G., 224
 Camurri G.B., 133, 135
 Camuzzini N., 92, 198
 Cancelli M., 257
 Candoli V., 84
 Cannone M., 223, 230, 231, 232, 233
 Cano L., 221
 Caño S., 202
 Canpolat S., 72
 Cantafora N., 225
 Cantagallo A., 87, 88, 97, 180, 226, 227
 Cantista P., 212
 Cantù F., 138
 Capitani D., 226
 Capodaglio P., 42
 Capomolla S., 267, 268
 Capovilla M., 241
 Cappa F., 88
 Cappa P., 226
 Cappellaro P., 101
 Cappelletti S., 128
 Cappellino F., 130, 131, 143, 277
 Cappuzzo V., 241, 242
 Capriotti M., 128
 Caputo M., 226
 Caraceni A., 275
 Caracò C., 161
 Caramma D., 246
 Carboncini M.C., 123
 Carcelli L., 93
 Carda S., 179
 Cardona G., 102, 103, 130, 131, 143, 277
 Cardoso B.L., 164
 Caretta I., 135
 Caretti M., 45
 Cariole M., 70
 Carioti R., 198
 Carle V., 198
 Carlisi E., 129
 Carlucci D.M., 101
 Carlucci R., 198
 Carnovali M., 49
 Caroli A., 271, 275
 Carone M., 121
 Carraro E., 105
 Carretta E., 224
 Carroll L., 278
 Carroll L., 34
 Carozza M.C., 119, 159, 244
 Carus D., 252
 Carvalho R., 234, 235
 Carvalho Y.S.V., 164, 167
 Casale R., 34, 93, 94
 Casaleggio M., 63
 Casanova P., 3
 Casarini C., 271, 275
 Casarotto M., 52
 Casas-Lázaro M.J., 90, 91
 Casasola V., 130
 Casci R., 95
 Caselli S., 88, 89, 108, 150, 151
 Cassarino S., 94
 Cassatella G., 116, 117, 118, 129
 Castaldo V., 18
 Castelli E., 205, 215, 226
 Castelli S., 175
 Castelo-Grande C., 204
 Castori M., 110, 111
 Castro A., 210, 211, 215
 Castro H., 178
 CATALDI C., 233
 Cataldo P., 102
 Catan L., 38
 Catanzaro S., 217
 Catanzaro T., 217
 Catena L., 148
 Cattin E., 119
 Cattozzo M., 248
 Cattunar G., 62
 Causa M., 131
 Causero A., 71
 Cavallaro T., 114
 Cavalli E., 224
 Cavallini L., 135
 Cavallo F., 273
 Cavazza S., 216
 Cavazzuti L., 230
 Caviggiola C., 12
 Cavina A., 87
 Cazzagon M., 201
 Cazzaniga M., 266
 Cazzola C., 269
 Ceccarelli S., 48
 Cecchi F., 113, 114, 157
 Ceceli E., 72
 Ceda G.P., 53
 Celestini M., 250
 Celia A., 89
 Celik B., 81
 Celik B., 82
 Celletti C., 110, 111, 157
 Cem E., 188, 199
 Censi G., 174, 175
 Ceriani E., 52
 Cerina G., 123
 Cerioli M., 70
 Cerquetti K., 207
 Cerrano A., 106
 Cerri C., 138
 Cerri C., 98
 Cerulli G.G., 223
 Cesario A., 135
 Cetani T., 232
 Çetin A., 70
 Cetinkaya E., 102
 Cevei M., 86
 Cevei M., 87
 Chadchavalpanichaya N., 35, 47
 Chaffaut N., 107
 Chalida E., 78
 Chandwani S., 156
 Checchia G.A., 92, 198, 199

INDEX

- Chen C.P.C., 65
 Chen Y., 209
 Chernikova L., 91, 213
 Chernikova L.A., 12, 27, 28, 68, 147
 Chesi E., 124, 216
 Chia-Hsin C., 141
 Chia-Ling L., 141
 Chiappedi M., 94
 Chiari L., 252
 Chiari S., 180
 Chiasera A., 256
 Chiavacci L., 157
 Chierchia M., 172
 Chigarev A.A., 238
 Chimento P.L., 93
 Chiodera P., 101
 Chiriji G., 29, 30
 Choi J.S., 190
 Choi Y., 144
 Chueluecha C., 35
 Chumwong N., 57
 Ciambrone R., 217
 Ciarimboli A., 259
 Ciarocca F., 270
 Cicero R., 270
 Cieplińska J., 86
 Cieściński J., 99, 266
 Cieza A., 209
 Cilia G., 268
 Cimolin V., 157
 Cinteza D., 195, 200
 Cioara F., 210
 Cioni M., 113
 Ciorica G., 145
 Cirasanambati M., 149, 175
 Ciraulo R., 90
 Ciric T., 219., 234
 Cirovic D., 21, 181
 Cirtautas A., 137
 Cisari C., 179
 Cisowska-Adamiak M., 266
 Cistaro A., 257
 Ciuffreda L., 129
 Ciulacu C., 85, 115, 247
 Ciullo F., 265
 Ciurli P., 97
 Cívicos Sánchez N., 176, 207
 Civitella A., 240
 Clarke M., 60
 Clementi D., 56
 Clemenzi I., 93, 94
 Cobelli C., 105
 Cocchini L., 134, 256
 Cocco Grifoni S., 128
 Cocco L., 41
 Coco V., 265
 Coiro V., 101
 Colavita S., 268
 Colella M., 267, 268
 Colizzi F., 273
 Collado H., 158, 249
 Colombo M., 195, 196
 Colombo S.G., 128
 Colonna F., 228, 229, 270
 Colovic H., 47, 183
 Colprim D., 76
 Colucci M., 230
 Coluccini M., 76
 Comelli M., 18
 Commodari I., 246
 Compostella A., 258
 Conejero Casares J.A., 156
 Consalvi A., 268
 Consuelo M., 91
 Contessa P., 105
 Conti A.A., 143
 Contini B., 48, 192, 222
 Contini E., 226
 Cooper D., 105
 Cop C., 227
 Coppadoro F., 259
 Coppola L., 30, 248
 Corda D., 277
 Cornaggia C., 98
 Cornelio F., 258, 258
 Cornelio P., 258
 Corrado B., 105
 Corrieri N., 67
 Corrochano C., 221
 Corrochano-García C., 165, 269
 Corsi B., 71
 Corsini C., 123
 Cortellini L., 112
 Cortese A.M., 155
 Cortese F., 259
 Cortese R., 248
 Cortet-Rudelli C., 8
 Corvaglia G., 92, 198
 Cosentino A., 52, 160
 Cosentino E., 168, 185
 Cossaro E., 41, 45
 Costa H., 108
 Costa H.R., 170
 Costa M., 181, 182
 Costantini A., 175
 Costantino C., 90, 269, 271
 Cotti M., 224
 Cousin A., 35
 Cozens J.A., 60
 Cozens J.A., 60
 Crăciun L., 85, 115, 133, 142, 146, 158, 247
 Crane C., 67
 Creatini L., 123
 Grecchi R., 159, 244
 Cremonini K., 124
 Crescini L., 196
 Crespo-Ruiza B., 48
 Cretaro L., 95
 Cretu O., 38
 Crevecoeur F., 104, 255
 Crimi G., 96
 Cripps R., 209
 Crispino G., 89
 Cristea C., 168, 169
 Crosignani B., 131
 Crovetto A., 63
 Crudo J.P., 107
 Cserhati P., 138
 Cuadrado Rebollares M., 207
 Cuca Varsalona S., 108
 Cuenca C., 153
 Cuenca-González C., 142, 177, 228
 Cuisinier R., 43
 Culmer P., 60
 Curcic Z., 208
 Cuxart A., 167
 Cuzdan N., 171
 Cvetkovic B., 6, 7
 Czernuszenko A., 184
- D**
 D'Addio O., 230
 D'Agostini S., 101
 D'Agostino C., 191
 D'Ambrosio F., 174, 175, 176
 D'Amico M., 270
 D'Andrea M., 152, 217
 D'Angelantonio L., 150
 D'Annunzio V., 167
 D'Arienzo G., 218
 D'Avanzo A., 150, 151
 D'Avanzo A.M., 151
 D'Erario T., 246
 D'Innocenzio M., 179
 D'Ippolito P., 212
 D'Onofrio C.N., 200
 D'Ottavio S., 48
 D'Urso G., 228, 251
 D'Urso P.I., 113
 Da Re C., 89
 Da Rin Della Mora P., 164
 Dajpratham P., 79
 Dalgi Y., 176
 Dalivigka Z.P., 41
 Dall'Agata D., 63
 Dall'Armi V., 135
 Dall'oca C., 96
 Dalla Corte G., 25
 Dalla Toffola E., 94
 Dallku I., 50
 Dallolio L., 224
 Damiani C., 34, 93, 94
 Damiani S., 248
 Daminov D., 1
 Daminov V.D., 1, 2, 3
 Damjanovic Z., 132
 Damjanovic Z., 139
 Danelon F., 247
 Danut C.V., 98
 Dardano E., 89
 Datta D., 276
 Daussin F., 108
 Daveluy W., 8, 57
 Daviet J.C., 18, 22
 Davila C., 28, 29, 30
 Dayaghi S., 37
 De Baets N., 253
 De Bellonia S., 243
 De Bernardi E., 94
 De Blasis P., 161
 De Buono D., 217
 De Canonico E., 223
 de Carvalho M., 69
 De Cicco D., 181, 182
 De Colle C., 101
 De Fabritiis M., 144
 de Faria Magalhães Torres D., 234
 De Franceschi S., 225
 De Francesco E., 232
 De Franco P., 113
 De Giorgi R., 145
 De Groot S., 209
 De La Corte H., 115
 De la Peña H., 228
 De Leo A., 268
 De los Reyes-Guzmán A., 83
 De Luca G., 268
 De Luca M.L., 103
 De Maio G., 101
 De Marco F., 105
 De Masi T., 89
 De Michelis V., 244, 245
 de Miguel Benadiba C., 48, 156
 De Nuzzo M.L., 223
 de Oliveira J.E.P., 234
 De Pedis M., 162
 De Ruyck E., 253
 De Santis E., 112
 De Santis F., 109, 111
 De Sena G., 24, 25
 De Serio A., 189
 De Tanti A., 147, 266
 De Tommaso M., 233
 Defloor T., 253
 Degli Agosti I., 129
 Del Ama-Espinosa A., 83
 del Ama-Espinosa A., 48
 Del Baño-Aledo M.E., 169, 170
 Del Din S., 105
 Del Gaudio G., 161
 Del Monaco A., 259
 Del Popolo G., 200
 Del Sordo L., 259
 Delarque A., 249, 280
 Deliond M., 55
 Dell'Armi V., 94
 Della Bella G., 48, 74, 187, 192, 205
 Della Cagna R., 259
 Delli Bergoli M., 116, 117, 129
 Delli Carri P., 117
 Delli Gatti A., 267, 268
 Dellomonaco A.R., 231, 232, 233
 Delussu S., 145
 Demirtas, R., 162
 Denes E., 22
 Denes Z., 55, 138, 246
 Denisewicz I., 92
 Deotto E., 238
 Dériaz G., 92
 Deriaz O., 73, 211
 Deries X., 51
 Detrembleur C., 104, 255
 Devečerski G., 156, 164, 274
 Devetti P., 121
 Di Bella F., 135
 Di Bella N., 103
 Di Benedetto P., 91, 125, 130, 238
 Di Bisceglie G., 187
 Di Bisceglie L., 187
 Di Carlo S., 134, 256
 Di Donna R., 118
 Di Gioia A., 224
 Di Giuseppe V., 93
 Di Gregorio G., 116
 Di Gregorio T., 26, 84
 Di Lasi G., 267, 268
 Di Lorenzo L., 18
 Di Marzio F., 128
 Di Mizio R., 259
 Di Pancrazio L., 261, 262, 263
 Di Pasquale A., 111, 113
 Di Pietro G., 161
 Di Stefano M., 130
 Diaconescu S., 195, 200
 Diamantino L., 195
 Dias L., 163
 Diaz Borrego P., 134
 Diaz P., 153
 Diaz R., 204
 Dicandia L., 60, 263
 Dickson H., 19
 Dicle Turhanoglu A., 100
 Diklic I., 25, 208
 Dim A., 195, 200
 Dimitrijević I., 6, 7, 47, 219, 234
 Dimulescu D., 28
 Dimulescu D.M., 28, 29, 30
 Dine I., 150, 151
 Dinomais M., 51
 Dinomaisa M., 55
 Dinu A., 205
 Dionisi L., 207
 Dionyssiotis Y., 39, 40, 45, 46
 Dipietro C., 246
 Diracoğlu D., 59
 Dispa D., 122
 DiVita M.A., 67
 Dj. Jandric S., 56
 Djokic I.R., 208
 Djurovic A., 213
 Djurovic N., 177, 186
 Dobai K., 75
 Dobsak P., 102
 Doğan A., 72, 162
 Doğu B., 176
 Dokuchaeva N., 91
 Domazou A., 179
 Domazou M., 174, 178
 Dominuti C., 238
 Donetti C., 271
 Dong Woo L., 100
 Donini L.M., 42
 Dora G., 241, 263, 264
 Doulias V., 84
 Doutréleau S., 108
 Doya Barca-Fernandez L., 153
 Drăgoi D., 80, 81
 Draca S., 218

- Draganac S.D., 204
 Dragić D., 105
 Dragin A., 218
 Dragin A.S., 202
 Dragoi D., 163
 Dragoi M., 38
 Dragoi R., 168
 Dragoi R.G., 85
 Dragomir M., 15
 Drakonaki E., 178, 179
 Draskovits T., 173
 Drigo D., 130
 Drira O., 38
 Duarte E., 120
 Duarte Ollé E., 77
 Dubljanin E., 54
 Dubljanin-Raspovic E., 77, 173, 211
 Dufour S., 108
 Dug-Young K., 75
 Duong T., 142, 235
 Dupeyron A., 206
 Durante C., 179
 Duro H., 189
 Durović A., 213
 Dzamic D., 21
 Dziri C., 58, 184
- E**
 Ebihara S., 102
 Ebreo M., 267
 Efstathiou I., 55
 Ehlebracht-König I., 207
 Ekaterina L., 9
 Ekman P., 251
 Eleopra R., 71
 Elhan A.H., 77
 El-Metwallyc A., 204
 El-tantawi G.A., 60
 Elyaspoor D.E., 162
 Emad M.R., 36, 38, 40
 Emami Razavi H., 35
 Emprin M., 43
 Enjalbert M., 107
 Ercalik T., 176
 Erceg T., 75, 107
 Erdem H., 102
 Erdem H.R., 54, 120
 Erden G., 247
 Erhan B., 161
 Eriks-Hoogland I., 209
 Eriks-Hoogland I.E., 209
 Ersoz M., 85
 Escalada F., 77
 Escolar-Reina P., 169, 170
 Esen E., 70
 Eshraghi A., 214
 Eskenazi A., 134, 256
 Espitia A.M.L., 197
 Esposito C., 12
 Estraneo A., 200
 Etelka Földi E., 277
 Evcik D., 61, 171, 172
- F**
 Fabbro E., 121
 Fabiano F., 150, 151
 Fabriani S., 205
 Fabrowski D., 85
 Faccani G., 124
 Faenza M., 88
 Fahim Anwar., 260
 Failla A., 130, 131, 143, 277
 Falappa A., 150
 Faletti S., 212
 Faliero F., 97
 Faller H., 207
 Falso M., 272, 273
 Fandridis E., 64
 Fanti G., 211
 Fanton E., 108
 Fanucci E., 48, 192
 Farago M.A., 203, 210
 Faranda A., 246
 Farenza B., 89
 Farmakides A., 78, 148
 Farmakidis A., 63, 64
 Faroni J.V., 118
 Farriols C., 76
 Fassaert J., 191
 Fassio C., 271
 Fata C.E., 157
 Fata E., 217
 Fata G.E., 187
 Fatatry A.M., 66
 Fateme Mortazi, 178
 Fatemeh Mir-Hojati S., 50
 Fattorello C., 45
 Favero L., 224
 Favre C., 73, 211
 Fazekas G., 55, 75, 138, 246
 Fazekas G.
 Fazio N., 268
 Febrer Rotger A., 233
 Fedeli M., 203, 266
 Fedi A., 150, 151
 Fellinghauer B., 17
 Feragnoli A., 18
 Ferlini G., 256
 Fernades P., 108
 Fernandes H., 188
 Fernandes L., 235
 Fernandes P., 178
 Fernández Caamaño C., 176
 Fernández S., 218
 Fernández T.R., 80, 164
 Fernandez-Caamaño C., 118, 195
 Ferrara P., 243, 244
 Ferrara P.E., 243
 Ferrari F., 230
 Ferrari M., 180
 Ferrari R., 135
 Ferrarin M., 113
 Ferraro C., 203, 255, 256
 Ferraro D., 113
 Ferraro G., 12
 Ferraro M., 88
 Ferriero G., 129, 134, 137
 Ferro S., 253
 Ferroni I., 226
 Ferrucci L., 53
 Feskou E., 178
 Festa F., 24, 25
 Festas I., 166
 Festas M.J., 166, 167
 Fiaschi A., 52, 122, 124, 126, 127, 160
 Fiè A., 174, 176
 Fiè L., 175
 Figen Ayhan F., 121, 257
 Figueiredo P., 190, 246, 263
 Filippello V., 266
 Filipov R., 249
 Filipovic S., 208, 209
 Filippi G., 259
 Filippi G.M., 157
 Filippi M.V., 84
 Filippini G., 258
 Filoni S., 116, 117, 118, 129
 Finckh A., 8
 Fiore Micello P., 117
 Fiore P., 116, 117, 118, 129
 Fiorentino A., 130, 131
 Fiorentino A., 277
 Fiorillo R., 118, 155, 176, 195
 Firera M., 267
 Fitnat Dincer., 278
 Fitoz F., 65
 Flansbjer U., 123
 Flores Calvete J., 176
 Flores-Torres I., 142, 177, 228
 Florio A., 179
 Florio C., 181
 Foggia L., 230
 Foglia C., 73
 Fogliato A., 134
 Fogliato A.L., 256, 257
 Fonseca F., 47
 Fontaine P., 8
 Fontana C., 52, 127
 Fontana I., 129
 Forcignanò M., 265
 Forenza D., 189
 Foresti A., 224, 225
 Formisano R., 97
 Fornasari P., 83
 Fornasiero M., 248
 Forner-Corderob A., 48
 Forogh B., 15
 Forough B., 165
 Forte A.M., 18
 Forugh B., 16
 Fotaki S., 78
 Foti C., 18, 48, 53, 74, 93, 94, 119, 149, 184, 187, 192, 205, 222, 240, 244
 Foti D., 152
 Fotinopoulos G., 78
 Fracchia S., 123
 Fragiaco E., 62
 Franceschini M., 138, 147, 279
 Franceschini M., 53, 73, 88, 89, 93
 Franceschini S., 95
 Franchignoni F., 137
 Franchini L., 230
 Franco M., 196
 Frank A.O., 182
 Franz S., 162
 Frasca G., 109
 Fraser M., 152, 154
 Fratocchi G., 153
 Fratto L., 217
 Frau G., 116
 Fredericson M., 280
 Fregni F., 216
 Frenkel-Toledo S., 220
 Frisoli A., 123
 Frisullo G., 113
 Fronczek M., 20
 Frusciantè R., 109
 Frustaci A., 138
 Fugazzaro S., 133, 135, 199, 224
 Fumene Feruglio P., 96
 Fundarò C., 93
 Furia J., 2
 Furia J.P., 2, 5
 Fusco A., 95, 152, 153
 Fusco M.A., 30
 Füsün Ş., 188, 199
- G**
 Gabriele I., 89, 89
 Gabriele O., 89
 Gabrielli M., 18
 Gabusi P., 58
 Gaffuri A., 73
 Gaffurini P., 180
 Gaita D., 85, 115, 133, 142, 146, 247
 Gajić D., 205, 222
 Gajofatto F., 126
 Galai C., 38
 Galanos A., 46
 Galardini M.I., 71
 Galassi R., 26, 84
 Galasso D., 89
 Galbeaza G., 195, 200
 Galeoto G., 111
 Galeri S., 145, 196, 219
 Gallagher J.F., 123
 Gallagher P., 137
 Galleri A., 116
 Galli E., 157
 Galliani P., 106
 Gallo C., 222, 248, 258
 Gallo I., 180
 Gallo V., 18
 Gallotta E., 136
 Galluso R., 272, 273
 Galluzzi F., 216
 Galtier F., 107
 Gambart G., 51
 Gambini M.G., 122
 Gandolfi E., 128
 Gandolfi M., 52, 122, 124, 126, 127
 Gangoiti L., 115
 Garbarino S., 118
 García Delgado L., 159
 García Delgado L., 211
 Garcia L., 153
 Garcia-Ameijeiras M.C., 202
 Garcia-Cruz A., 155
 Gariboldi F., 275
 Garrè O., 82
 Garrett A., 39
 Garrote L., 221
 Garrote-Moreno L.C., 165, 269
 Gartzios C., 174
 Gascón-Cánovas J.J., 169
 Gasparini M., 179
 Gasparotti R., 76
 Gasparroni V., 123, 191
 Gatta A., 245
 Gatti D., 96
 Gatto R., 51, 53
 Gaudenzi N., 224
 Gavrilà Ş., 79
 Gavrilovic G., 272
 Gazzani L., 128
 Gazzara G., 268
 Gazzetti V., 109
 Gazzotti A., 224, 225
 Gebremariam L., 159
 Geçene M., 257
 Geidl W., 128, 190
 Gekas I., 201
 Gelli I., 71
 Gemignani P., 226
 Genc A., 77, 115
 Genc H., 102
 Gentili S., 118, 192
 Geny B., 108
 Georganas M., 39
 Georgiadis T., 174
 Geraci A., 88
 Geraci E., 103
 Gerber F., 211
 Gerini A., 78, 119
 Geroin C., 52, 124
 Gerostathopoulos N., 64
 Gessaga V., 84
 Gestoso L., 150
 Ghanizadeh A., 37
 Ghetti G.G., 175
 Ghiringhello S., 73
 Ghirmai S., 123
 Ghorbel S., 58, 184
 Giaccagliani E., 95
 Giacchetti P., 95
 Giacomini A.L., 225
 Giaffreda G., 56
 Giambuzzi M., 164
 Giannetto F., 72, 79
 Giannini F., 110
 Giannini S., 124
 Giannoulis F., 64
 Gianotti N., 248, 258
 Giattini A., 207
 Gigante G., 144, 192
 Gigante R., 230
 Giglio D., 140

INDEX

- Gil Agudo A., 83, 156
 Gilardi A., 109, 111, 112
 Giménez-Abadía M.A., 165
 Gimigliano F., 12, 161
 Gimigliano R., 161, 200
 Ginichkina I.Y., 237
 Gioia G., 155
 Gioia M., 161
 Giordani L., 192
 Giordano A., 137
 Giorgi I., 70, 271
 Giorgini C., 67
 Giorgini T., 125, 130, 238
 Giovagnoli A., 62
 Giovannico G., 223
 Giovannini A., 30, 248
 Giovanzana P., 179
 Girardi P., 122
 Girlanda P., 113
 Girolami, K., 180
 Giubilei F., 146
 Giugliano A., 12
 Giunta N., 241, 242
 Giunta R., 264
 Giuntoli F., 71
 Giuso R., 116
 Giusti A., 164
 Giustini A., 135
 Gjoraas A., 142
 Glama A., 85
 Glerum S., 159
 Gobbi B., 95
 Gobbo M., 180
 Godi M., 137, 251
 Gogić D., 61
 Goharpey S., 196
 Gojka G., 142
 Gokce-Kutsal Y., 72
 Goktepe A.S., 187
 Goldman D., 192
 Golia M., 89
 Golubovic S., 103, 104
 Gomes C., 235
 Gomes M.M., 170
 Gómez-Garrido A., 202
 Gonçalves L., 87
 Gonçalves S., 108
 Gonçalves Viamonte S., 178
 Gonzalez A.M., 106
 González Burgos S., 159, 211
 González L., 150
 Gonzalez-Moro M., 220
 Gonzalez S., 153
 Gorbunov F., 250
 Gordish H., 235
 Gorgerino P., 106
 Gorochova I.G., 1
 Gotor Ferrer P., 96
 Goumas C., 84, 97, 148
 Grajic M., 158
 Gramigna C., 195
 Granata G., 111, 113
 Grandis M., 191
 Granella L., 125
 Granger C.V., 67
 Granone P., 135
 Grassmeyer., 235
 Grasso A., 123
 Grasso J., 174
 Grasso M., 251
 Grasso M.D., 200
 Gravina A.R., 105
 Graziani G., 250
 Graziani P., 224
 Grazio S., 51
 Greco G., 123
 Greco P., 150, 151
 Grigoriadis K., 55
 Grill E., 17
 Groeschelb S., 55
 Groppi M., 144, 217
 Grossi V., 145
 Grosso M., 191
 Groumas N., 174, 179
 Grubiša S., 56
 Grubišić F., 51
 Gruin C., 38
 Grundböck E., 173
 Gualandi G., 199
 Guanziroli E., 195, 196
 Guarcello G., 181, 182
 Guarda-Nardini L., 255
 Guardiola-Beltrán N., 90
 Guardiola-Beltrán N.M.J., 91
 Guariglia M., 200
 Guarinoni L., 219
 Guedes R., 235
 Guerron D., 235
 Gugelmetto M., 223, 260
 Gugleta D., 26
 Guglielmelli E., 136
 Guglielmin R., 105
 Guida G., 60
 Guidi M., 128, 175
 Guidolin L., 30, 248
 Guillen A., 120, 183
 Guillén Solà A., 77
 Guiotto A., 105
 Guk R. Yu., 28
 Güler H., 100
 Gulletta E., 152
 Gulseren Akyuz., 251
 Gunduz B., 161
 Gurler A., 171
 Gursakal S., 176
 Gusmão., 235
 Gutenbrunner C., 207
 Guven M., 171
 Guzik P., 85
 Gworys K., 20
 Gyalai I., 101, 102
- H**
 Habibur Rahman M., 163
 Hadianfard M.J., 36, 38, 40
 Hafiz M., 99
 Hagner W., 99, 266
 Hai I., 44, 46
 Haist J., 5
 Hakan Gunduz O., 215
 Hamonet J., 22
 Hanon R., 73
 Hansjürgens K., 62
 Hanspal R., 41, 42, 43, 44, 46
 Hawamdeh M., 48, 192
 Hawamdeh Z.M., 217
 Hay E., 159
 Heinle S., 34
 Helbok R., 222
 Henriques A.R., 141
 Herceg M., 83
 Herchi W., 58, 184
 Heriseanu R.E., 68
 Hernandez C., 153
 Hernández de la Peña C., 142, 159
 Hernandez Manada M., 156
 Herranz-Torrubiano A., 177
 Herrero Iscar T., 165
 Hesse S., 21, 52, 124
 Hijas Gómez A.L., 96
 Hilfiker R., 209
 Hoble L.D., 85
 Hobson L., 111
 Hoffmann A., 85
 Hofmann J., 128
 Hoinoiu T., 104
 Hokanson K., 142
 Hölig C., 34
 Holt R.J., 123
 Holt, R., 60
 Homayouni K., 139
 Hoon Seo C., 274
 Horak F., 137
 Hrklović M., 4, 6
 Huisstede B.M., 159
 Huisstede M.A., 159
 Hülya S., 199
 Hundozi H., 59, 67
 Hye Won K., 75
 Hyeon Mun J., 274
 Hysenaj H.H., 50
- I**
 Iacomussi T., 228
 Ianelli I., 89
 Ianes A.B., 150, 151
 Ianes P., 122
 Ianieri G., 127, 140, 155, 254, 261
 Iannaccone E., 109
 Iannella C., 259
 Iannelli I., 89
 Iantorno M., 235
 Iazzetta F., 161
 Ibragimov T., 9
 Ieki H., 194
 Ieri I., 71
 Ilbars D., 66
 Ilic N., 77, 211
 Ilic N.V., 173
 Ilic T.V., 173
 Ilic-Jovic L., 197
 Ilieva E., 16, 202, 265
 Imazio P., 125
 Imbrenda M., 138, 149
 Incasa U., 58
 Ince N., 81, 82
 Inglese C., 147
 Innocenti M., 154
 Inoue H., 194
 Invernizzi M., 179
 Ioanna C., 267, 268
 Ioannilli F., 95
 Iocco M., 152, 157, 217
 Iodice P., 261, 262, 263
 Iolascon G., 161
 Itona L., 125
 Iona L., 238
 Ionescu A., 182
 Ionna F., 161
 Ionova V., 213
 Iosa M., 95, 109, 152
 Ippolito S., 94
 Irlenbusch U., 34
 Irsay L., 202
 Isabel Forner-Cordero I., 277
 Isabelli G., 241
 Isaeva T., 25, 237
 Isner-Horobeti M.E., 108, 206
 Isoardo G., 124
 Ito O., 102
 Iurciuc M., 85, 115, 133, 142, 145, 146, 247
 Iurciuc S., 85, 115, 133, 142, 145, 146, 247
 Ivanov V., 237
 Ivanova E., 9
 Ivánovic-Barbeito Y., 206, 218, 227
 Ivascu M., 57, 146
 Iversen M.D., 43
- J**
 Jacinto J., 141
 Jackson A.J., 60
 Jacques D., 7
 Jafarova O.A., 28
 Jagatsinh Y., 31
 Jagiello J., 184
 Jamontaite I.E., 136, 137
 Jamous M., 42
 Jandrić S., 108
 Janes K., 235
 Jang K.U., 190
 Janik H., 42
 Janković D., 108
 Janne P., 7
 Januário F., 47
 Jauregui Abrisqueta M.L., 176, 207
 Jelic Z., 197
 Jellad A., 214, 215
 Jesus A., 141
 Jevtić N., 61
 Jiing-Yuan S., 141
 Jimeno-Serrano F.J., 169, 170
 João Andrade M., 171, 210
 Joao Miranda M., 189
 Jokar S., 186
 Jokić A., 62
 Jong Hwa L., 91
 Jong In L., 75
 Jonsdottir I.H., 252
 Jordan G., 191
 Josephsson S., 225
 Jovanovic A., 158
 Jovanović J., 249
 Jović S.J., 202
 Jovicic Z., 56
 Juhakoski R., 197
 Jung S., 99, 266
 Juocevičius A., 136
- K**
 Kaczor R., 86
 Kaji N., 273
 Kakinoki R., 194
 Kalantzopoulos D., 148
 Kalaveshi A., 67
 Kaligerou M., 63, 64
 Kaligerou S., 228
 Kaliontzoglou A., 40
 Kamilykova E.A., 10
 Kalokairinou K., 174, 178
 Kamaledini H., 186
 Kamil Yazicioglu K., 65
 Kanellopoulos A., 63, 64
 Kantarcı F., 247
 Kanter S., 42
 Kaparow A., 133
 Kapetanovic A., 249
 Kapriof J., 204
 Karabay I., 263, 264
 Karadag-Saygi E., 215
 Karagoz A., 102, 120
 Karaliotas G., 63, 64
 Karczmarczyk A., 92
 Karimi A., 52, 186
 Karvouni A., 40, 45
 Kaszewska A., 85
 Katancevic B., 103, 104
 Kateros K., 63
 Kaya D., 197
 Kaya K., 85
 Kazemi B., 37
 Keković V., 205, 222
 Khadse P.H., 97
 Khakimov S.A., 237, 238
 Khansefid M., 203, 266
 Khatkova S.E., 238
 Khosla S., 128
 Kilac H., 215
 Kil-Byung L., 75
 Kimura J., 59
 Kiourtidis D., 40, 45
 Kiper P., 160
 Kiper P., 41
 Kiralp M.Z., 141
 Kiraz S., 70
 Kirchhof R., 207
 Kiviniemi V., 197
 Klein D., 46
 Kliafas I., 40, 45

INDEX

- Klochkov A.S., 68, 147
 Knezevic A., 164
 Knezevic T., 21
 Kobayashi M., 194
 Koc B., 120
 Kocaoglu S., 66
 Kocic M., 6, 7, 87, 219, 234
 Koes B., 159
 Koes B.W., 159
 Kohler F., 19
 Kohzuki M., 102
 Kokkonis P., 228
 Koldas Dogan S., 61, 171, 172
 Koleva I.B., 31, 185
 Konchugova T., 249
 Koneva E., 237
 Koneva E.S., 238
 Konovalov R.N., 27
 Konrad G., 132
 Konstantinovic L.M., 202
 Konstantinović L., 4, 6
 Konzelmann M., 73, 211
 Kopluku B., 224
 Kopp J., 142
 Korchazhkina N., 21
 Kordowicz I., 20
 Korotkiy V.V., 238
 Kosmidis P., 174, 178
 Kostic R., 132, 139
 Kostureva M., 213
 Kotroni A., 274
 Koutsikos K., 149
 Koyuncuoglu H., 160
 Kozlovskaya I.B., 27
 Kozłowski O., 8
 Kozo H., 66
 Kraft K., 42
 Krajnov J., 164
 Krasniqi V., 146
 Krasuski M., 20
 Kriščiunas A., 33
 Krotenkova M.V., 27
 Krstic N., 77, 173, 211
 Kruitbosch J.M., 80
 Krunic-Protic R., 68
 Kucukdeveci A., 115
 Kucukdeveci A.A., 77, 99
 Kujawa J., 20
 Kulikova I.S., 1
 Kupper D.D., 8
 Kuran B., 176
 Kuret Z., 133
 Kuroki H., 194
 Kurosawa H., 102
 Kurtais Aytür Y., 99
 Kurtais Y., 115
 Kutlay S., 77, 99, 115
 Kuzgun S., 189
 Kuznetsov A.N., 2
 Kyeong Woo L., 91
- L**
 La Maestra C., 199
 La Maestra S., 199
 La Porta F., 88, 89, 108, 150, 151, 227
 La Torre G., 110
 La Viola P., 215
 Laajili H., 214, 215
 Lach-Inszczak S., 99, 266
 Laganà F., 23
 Lagares Alonso A., 156
 Lai G., 205
 Laimi K., 47, 50, 68
 Laíns J., 203, 246
 Lalandá M.J., 141
 Lalli A., 255, 258
 Lamacchia S., 231
 Lamberti G.F., 198
 Lampa S., 185
 Lancioni G.E., 228, 229
- Landi A., 129
 Lanfalconi G.A., 146
 Lange S., 71
 Lanieri Milazzo M., 109
 Lannsjö M., 123
 Lanzetta M., 223
 Lanzi R., 264
 Lanzillo B., 200, 266
 Lanzilotti C., 228, 229, 270
 Lapenna L.M., 135, 136
 Larsman A., 251
 Lascar I., 192, 193, 194
 Lasek W., 99, 266
 Laterza C., 128
 Laurentaci C., 60, 263
 Lauretani F., 53
 Lauria V., 135
 Lauricella L., 102, 103
 Lauro M., 242
 Lavermicocca V., 231, 232, 233
 Lavezzi S., 249
 Lazovic M., 33, 87, 157, 183, 186, 219, 234, 240
 Lazzeri G., 48
 Le Pera D., 113
 Lebib S., 58, 184
 Leblond C., 107
 Lebrino L., 242
 Lecchi C., 125
 Leclercq V., 86
 Lecocq J., 206
 Leduc A., 277
 Leduc O., 277
 Lee J.Y., 190
 Lee S., 144
 Leemann B., 8
 Lefebvre H., 5
 Leino M., 187
 Leite M.J., 212
 Lejeune T., 104, 122, 255
 Lenti G., 88
 Lentino C., 92, 198
 Lento M.G., 106
 Lenzi D., 199
 Leo L., 217
 Leonardo D., 87
 Leon-Espitia A.M., 202
 Leoni V., 118, 143
 Lepiece B., 7
 Lerma M., 235
 Lesic A., 68
 Letizia Mauro G., 82
 Levesley M.C., 60, 123
 Liadov K., 239
 Liebermann D., 220
 Ligabue M.B., 230
 Likoudi N., 228
 Lima A., 87
 Limanowska H., 20
 Limido L., 22
 Limone D., 248
 Lino M., 150, 151
 Liotta G.A., 113
 Lipanfe J., 238
 Lippert-Grüner M., 37
 Lippi P., 210
 Lisanti M.R., 60
 Listrani A., 135
 Liu Nanhai Z., 9, 10
 Ljesevic B., 218
 Ljoka C., 74, 119
 Ljubic J., 197
 Ljubinkovic K., 272
 Ljubojević G., 222
 López-García M.J., 165, 269
 Lo Muzio M.P., 116, 117, 129
 Lo Nigro A., 256
 Lo Vullo G., 62
 Lombardi B., 138, 149, 174
 Lombardi F., 230
 Lombardi L., 216, 212
- Lonsdorfer-Wolf E., 108
 Lopes A., 198
 Lopes de Carvalho M.L., 131, 132
 Lopes H., 163
 Lopes M.L., 132
 Lopez Lopez A.M., 191
 Lopez M.L., 221
 López-F S., 174
 López-Lozano R., 165
 Lorber G., 131
 Lorenzetti R., 95
 Lorenzini R., 71
 Loreto V., 200
 Lorusso R., 242
 Lotito G., 158
 Lourido Estévez M.V., 155, 176
 Lourido-Estevez V., 118, 195
 Lovzevitch N., 25
 Lozano-Guadalajara J.V., 165, 220, 221
 Lucangeli A., 260
 Lucas I., 246
 Lucia B., 114
 Luczak E., 20
 Luisi F., 18
 Lukac T., 206
 Lukovic G., 213
 Luna M., 76
 Lundgren-Nilsson Å., 251
 Lupo A., 275
 Lussignoli D., 180
 Lussu A., 90, 116
 Luthi F., 73, 92
 Lutsenko A., 240
 Lyadov K., 25, 236, 237, 240
 Lyadov K.V., 236, 237, 238, 239
 Lykos N., 97, 148
 Lykoudi N., 228
 Lyp M., 86
 Lyritis G., 39, 45, 46
- M**
 MA Shakoar., 264
 Maaiah M., 78
 Maaroos J., 126
 Maathuis M.H., 17
 Macchetta C., 134, 256, 257
 Macchi C., 143
 Macedo J., 106, 120, 170, 171
 Macfarlane J., 31
 Machado V., 166
 Machado Vaz I., 189
 Macian F., 22
 Maciel J., 84
 Mackiewicz-Milewska M., 85, 92, 99, 266
 Mackiewicz-Nartowicz H., 85, 99
 MacLachlan M., 137
 Madariaga Zabala A., 176, 207
 Maestri A., 125
 Maffulli N., 2, 5
 Mafra Moreno A., 234
 Magagni G.A., 26, 84
 Magalhães S., 106, 108, 120, 170, 171, 218
 Maggi G., 191
 Maggi L., 243, 244
 Maggio M., 53
 Maggioni A., 198
 Maggioni G., 271, 275
 Magistrone A., 129
 Magni E., 74
 Magoni L., 196
 Magoni M., 76
 Magri R., 151, 152
 Magrini A., 163
 Magrone G., 135
 Maidul Islam., 264
 Maieron M., 101
- Maietti A., 145
 Maiorano M.G., 265
 Majstorović B., 222
 Makarova M., 25, 237
 Makarova M.R., 238
 Makower S., 60
 Malaia L., 204
 Malanichev S., 240
 Malinverno F., 271
 Malmivaara A., 197
 Malvicini A., 272, 273
 Manaos E., 274
 Mancas S., 115, 133, 142, 146
 Mancini E., 149
 Mancuso M., 226
 Mandalari P., 268
 Mandic M., 6, 7
 Mandić M., 144, 279
 Manera M., 271
 Manevskiy A.P., 238
 Manfredini D., 255
 Manfredini M., 254
 Manganotti C., 96
 Manganotti P., 71
 Mangone G., 129, 163
 Mani V., 78, 97, 148, 178
 Manigrasso V., 224
 Mascalco G.T., 181
 Manojlovic M., 77
 Manojlovic Opacic M., 54, 158
 Manoli M., 246
 Mansmann U., 17
 Mansuroglu A., 100
 Mantelli M., 241, 242
 Mantellini E., 245
 Mantellini M., 244, 245
 Manthos P., 228
 Mantovani M., 88
 Manzoni L., 57
 Mao-Hsiung H., 141
 Marangio E., 90, 269
 Marangon L., 260
 Marantes I., 128
 Marcante A., 149
 Marcassa G., 149, 185
 Marcellini F., 252
 Marchese A., 250
 Marchese D., 152
 Marcheselli S., 123
 Marchetti P., 230
 Marchi E., 180
 Marchini C., 71
 Marchioni M., 242
 Marchionni M., 146
 Marchionni V., 224
 Marco E., 120, 183
 Marconetto M., 125
 Marcu I.R., 56, 98, 99
 Marcu R., 54, 98
 Marcu V., 195, 200
 Margallo P., 246
 Margutti F., 95
 Mariam Zarin Moghadam, 178
 Mariani C., 106
 Maric V., 183
 Mariconda C., 81
 Marin B., 18
 Marin D., 91
 Marinček Č., 44
 Marino P., 180
 Mariotti S., 144
 Marjanović B., 49, 105
 Markez S., 205, 222
 Marković S., 62, 77, 107, 206
 Marković S.K., 249
 Markulinčić B., 51, 192
 Markus Kalisch M., 17
 Marone U., 161
 Marques S., 178, 189, 218
 Márquez M.A., 77, 121, 122

INDEX

- Marri A., 262
 Martín R., 150
 Martínez-Gonzalez-Moro I., 220, 221
 Martínez P., 162
 Martínez S., 206, 227
 Martínez-Garre C., 166
 Martínez-Llorens J.M., 183
 Martini C., 154
 Martinoli C., 111
 Martins F., 39
 Martins L., 235
 Martone M.S., 116, 117, 118
 Maruzzi A., 116, 117
 Marvulli E., 140
 Marvulli R., 127, 140, 155, 254, 261, 270
 Marzetti E., 243
 Marzi C., 156
 Marzorati S., 56
 Mas A., 211
 Masanic C., 46
 Mascolo D., 232
 Maselli F., 223, 230, 231, 232, 233
 Maselli M., 135
 Masiero S., 30, 105, 144, 248, 255, 256
 Massaro C., 248, 258
 Massazza G., 134
 Masserano G., 179
 Massone A., 266
 Massucci M., 136
 Mastrangelo S., 230
 Mastromattei A., 198
 Mastrotauro L., 127, 140, 254, 261
 Matarrese M.R., 18
 Matcau D., 31
 Mateas C., 38
 Matei D., 69, 80, 81, 163, 205
 Matejevic T., 103, 104
 Mathews J., 149
 Mathiopoulos A., 224
 Matijević V., 51
 Matos M.J., 150
 Matthews J., 175
 Mattila C., 187
 Mattioli F., 76
 Mauri R., 139, 275
 Mauro G.L., 102, 103
 Mavrogenis A.F., 64
 Mayilvaganan B.S., 175
 Mazaux J.M., 5
 Mazis A., 64
 Mazis G., 63, 64
 Mazzocco R., 203
 Mazzoleni S., 119, 159, 244
 Mazzone C., 72
 Meazza E., 95, 275
 Medici L., 196
 Medina Cantillo J., 233
 Medina Estévez F., 45
 Medina-Mirapeix F., 169, 170
 Megna G., 60, 127, 140, 155, 189, 228, 229, 231, 232, 248, 254, 261, 270
 Megna M., 127, 230, 231, 232, 233, 248, 254, 261, 263
 Mehmetoglu O., 190
 Meijer J.W.G., 50, 126, 191
 Meinrath N., 235
 Meirshamsi M., 49, 69
 Meléndez M., 167
 Melnik K.A., 27
 Meloni M., 241, 244
 Melton L.J., 128
 Memon N., 41, 42
 Menarini M., 78, 225, 266
 Mendez K., 153
 Méndez Suarez L., 45
 Méndez-Saavedra K.V., 142, 177, 228
 Mendoza-Latorre M.A., 90, 91
 Menna M., 146
 Mennuni S., 140, 155, 270
 Mercante O., 174, 175, 176
 Merico A., 149, 168, 185
 Merlo A., 201, 230
 Messaud C., 7
 Messina S., 109, 265
 Metallo L., 267, 268
 Metsähonkala L., 47
 Metzler M., 142
 Miccichè F., 271
 Miccinilli S., 135
 Miccoli B., 225
 Miccoli R., 224
 Miccoli S., 254, 261
 Micello M.A., 116
 Micello M.F., 117, 118
 Micha M., 224, 228
 Michalak A., 46
 Michas G., 46
 Michelin S., 131, 131, 143, 277
 Michelotti L., 131
 Migaw H., 214, 215
 Migliorini M., 210, 216
 Mignano M., 73, 147
 Miguel Ribeiro M., 171, 189
 Miguez P., 235
 Mihai D., 104
 Mihout K., 201, 274
 Mikkelsen M., 204
 Milano G., 244
 Miletto D., 230
 Mili E., 267
 Milić-Krčum B., 108
 Miličević B., 274
 Milica L., 234, 260
 Milicin C., 38, 104
 Milinavičienė E., 33
 Milincic Z., 181
 Miljkovic I., 25, 208
 Milovanović-Arsić J., 61, 62
 Milutinovic S., 119
 Mimmo M.A., 116, 117, 118, 129
 Minciotti I., 110, 111, 113
 Minerva A., 116, 117, 118
 Minnella S., 269
 Mion S., 74
 Mirabelli C., 3, 12
 Mirallas-Martínez J.A., 90, 91
 Miranda Calderín G., 45
 Mirarchi U., 106
 Mirbod S.M., 186
 Miri I., 58, 184
 Mirković G., 105
 Miselli I., 269
 Mitoiu B., 57
 Mitoiu B.I., 146
 Mitrovic D., 25, 208
 Mitsis V., 78, 84, 148
 Miura M.K., 194
 Mocan T., 202
 Moghadam M.Z., 186
 Mohammadi R., 50
 Moharić M., 179
 Moineau B., 43
 Mojsije A., 260
 Molatore K., 184
 Molia S., 218
 Molino L., 125
 Molino Lova R., 114, 143, 157
 Molins J., 80, 164
 Mologhianu G., 28, 30, 57, 146, 182, 192, 193, 194
 Molteni F., 195, 196
 Mon Williams M., 60
 Monaco C., 271
 Monami S., 180
 Mondin E., 226
 Monesi G., 273
 Moneta G., 130, 131, 143, 277
 Monici M., 154
 Montagnana B., 160
 Montalcini T., 152
 Montanari S., 83
 Montanaro M., 179
 Monteone P., 182
 Montesinos L.L., 167
 Montesinos-Magraner L.L., 165, 166
 Montez A., 190, 263
 Monti Bragadin L., 91, 125, 130
 Monti Bragadin M., 191
 Monti E., 225
 Monticone M., 70
 Montilla Dominguez J., 96
 Montilla-Herrador J., 169, 170
 Montis A., 249
 Moore E., 167
 Morales A., 183
 Morales Mateu A., 233
 Morandi M., 48
 Morbiato A., 106
 Morbilli L., 135
 Morchower A., 101, 235
 Moreno-Carrillo M.A., 269
 Moretti B., 265, 265
 Moretti L., 265
 Moretti S., 174
 Morfini M., 154
 Morgantini A., 148, 150
 Mori N., 102
 Mori S., 128
 Morinaga T., 194
 Morisani E., 139
 Morone G., 95, 152, 199
 Morozova O., 142
 Morrone M., 135
 Mortazi F., 185
 Moslavac S., 279
 Motta R., 131, 132
 Mounier-Vehier C., 35
 Mousavi S.J., 51
 Moyeenuzzaman M.D., 44
 Mozafari F., 186
 Mozhgani P., 214
 Mugnaini S., 192
 Muharrem Geçene M., 121
 Mujić Skikić E., 274
 Mujović N., 4, 6
 Mulè C., 125
 Müller W.D., 34
 Mun J.H., 190
 Munari D., 52, 124, 127
 Muniesa J.M., 76, 77, 120, 122
 Munjal R., 276
 Munoz M., 22
 Muñoz-Mateo J., 118, 195
 Muraja S., 51, 192
 Murgu A., 57, 146, 182, 192, 193, 194
 Muroya K., 102
 Murtezani A., 50, 59, 146
 Musavinasab M., 37
 Musci L., 265
 Musekamp G., 207
 Mutlu H., 141
 Myllymäki A., 120
- N**
 N'Guyenf S., 55
 Nachum Soroker ., 219
 Nacir B., 102, 120
 Nadalini A., 230
 Nagaraju K., 235
 Nagasaka M., 102
 Nagel A., 85, 158
 Naguib A.H., 66
 Nair S., 276
 Nakagawa Y., 194
 Nakamura T., 194
 Nalon G., 259
 Nankaku M., 194
 Nannetti L., 212
 Napolano R., 161
 Nardi A., 81
 Nardone A., 137, 251
 Nascimbeni A., 73
 Nascimento R., 166
 Nastasi V., 268
 Natale E., 156
 Natividad Andres R., 176
 Navarro E.M., 77
 Navarro Solano J., 228, 229, 270
 Navarro-Pujalte E., 169, 170
 Navid Taheri K., 196
 Nazarinia M.A., 36, 40
 Nazarova G., 249
 Nazzal M., 78
 Nedeljkovic S., 181
 Nedeljkovic U., 77, 173, 211
 Negrini S., 74, 143
 Nemčić T., 51
 Nemes D., 38, 104, 168
 Neri C., 188
 Neri M.L., 224
 Nervi O., 271
 Neto H.L.C., 170
 Neumann V., 74
 Nguyen Hoang C.L., 22
 Nguyen V., 104, 255
 NGuyen-Hoang C.L., 22
 Nica A., 57, 182
 Nica A.S., 146, 192, 193, 194
 Nicita D., 18
 Nicodemo M.L., 250
 Nicolas Christodoulou N., 261
 Nicoletti N., 198
 Nicolini R., 264
 Nieto J., 150
 Nigito C., 243, 244
 Nikčević L., 4, 6
 Nikolaos Barotsis N., 261
 Nikolic D., 21, 181, 197
 Nikolic O., 253
 Nikolić J., 222
 Nikolić-Pucar J., 205
 Nikolik-Dimitrova E., 173
 Nikolova E., 143
 Nilsson Å.L., 123, 252
 NiMhurchadha S., 137
 Niolu M., 248
 Niță A., 168, 169
 Noditi V., 113
 Noditi G., 104
 Nofri G., 135
 Nolte S., 207
 Noro F., 196, 219
 Noronha C., 246
 Norouzia Javidan A., 35
 Notarnicola A., 265
 Nougier V., 43
 Novak P., 133
 Novakovic B., 164
 Novakovic I., 181
 Novaković B., 274
 Novelli L., 273
 Nožica-Radulović T., 108
 Nucciotti R., 200
 Nunes H., 235
 Nuñez Farias A., 233
 Nunziati G., 118
- O**
 O'Connor R.J., 74
 Obukhovskaya A., 1
 Odelli S., 53
 Ogonowski A., 86
 Ogtululer G., 189
 Okajima Y., 4
 Oksanen A., 120

INDEX

- Oksanen T., 50
 Okumus M., 72
 Okuyucu E., 100
 Olascon G., 161
 Oliveira-Sousa S.L., 169, 170
 Olivieri R., 275
 Olivo C., 130
 Olvirri S., 90
 Olyaei G.R., 51
 Ometto M., 180
 Onac I., 202
 Ones K., 81, 82
 Onesta M.G., 219
 Onesta M.P., 266
 Onofrei R., 38, 168, 169
 Oravičan M., 85, 158
 Orazi P., 95
 Origlio M., 246
 Orini S., 125
 orio R., 113
 Orizio C., 180
 Orozco-Levi M., 183
 Orsolino A.M., 223
 Orsolya P., 55
 Ortiz Fernández L., 176, 207
 Orzes S., 24, 25, 30
 Osborne R., 207
 Osmani T., 146
 Osmani-Vllasolli T., 67
 Ösmidis P., 179
 Ostan F., 217
 Ostaro E., 22
 Ouchterlony D., 46
 Oweidi A.S.A., 217
 Özçakar L., 17, 66, 247
 Özdemir O., 70
 Ozden V., 59
 Ozel S., 85
 Ozer C., 100
 Ozeri Z., 54
 Özgirgin N., 162, 263, 264
 Ozkan S., 190
 Oztuna D., 99, 115
 Ozturk C., 141
 Ozyurt O., 141
- P**
 Pacciani E., 215
 Paci M., 212
 Pacifici G., 118
 Pacini M., 226
 Pacini P., 150, 151
 Padua L., 109, 110, 112, 113, 114
 Padua L., 157, 167
 Padua R., 110
 Pagani M., 123
 Pagés E., 167, 197
 Palamar D., 247
 Palano F., 116
 Palano F., 117
 Palermo F., 206, 225
 Palini G., 145
 Pallant J., 252
 Palma E., 73, 138, 147
 Palmitessa A., 124
 Paľšytė T., 136
 Pampolini C., 216
 Panahande B., 50
 Panariello G., 200
 Pancucci G., 140
 Panella L., 108
 Paniccia C., 240
 Paniccia M., 270
 Panou A., 264
 Pantelic S., 253
 Pantelinac S., 164
 Panunzio M., 116
 Paolucci S., 152
 Paolucci T., 152, 153
 Papachristos A., 228
 Papadaki E., 274
 Papadaki P., 174, 178, 179
 Papagelopoulou P.J., 64
 Papaioannou P., 39, 45
 Papakosta S., 174
 Papalia F., 180
 Papapietro N., 135
 Paperini A., 143
 Paquereau J., 57
 Parada F., 84, 166, 167
 Paradinha S., 141
 Paradisi F., 145
 Paradiso P., 263
 Paravati S., 244
 Parente A., 231, 232, 233
 Pareyson D., 114
 Parnianpour M., 51
 Páscoa Pinheiro J., 47, 190, 263
 Pascoli M., 196
 Pascual F., 153
 Pascual-Gómez F., 142, 177
 Paspalj D., 218
 Paspati I., 39
 Pasquetti F., 163
 Pasquetti P., 129, 154
 Pasquini G., 143
 Passarielli C., 200
 Pastorello M., 22
 Pastorino A., 183
 Pastorio A., 259
 Patanè F., 226
 Patanè G., 219
 Patanella A.K., 113
 Patatoukas D., 78, 84, 97, 148
 Patella S., 265
 Patrascu J.M., 169
 Patru S., 54, 56, 98, 99
 Pavese C., 94
 Pavlov P., 252
 Pavlov S., 177
 Pavlović M.D., 158
 Pazzaglia C., 110, 111, 113, 114, 157
 Pedace R., 89
 Pedersoll W., 235
 Pejovic V., 213
 Pelillo F., 264
 Pellegrino A.R., 114
 Pellegrino M., 150, 151
 Pellegrino M.G., 151
 Pellicer-Fernández E., 165, 269
 Peñasco-Martín B., 83
 Penders J., 252
 Penionzhkevich D., 250
 Penna M., 118
 Penna M.C., 259
 Pentti J., 50
 Pereira A., 246
 Peret P., 174
 Perez Fernandez N., 96
 Perez L., 150, 151
 Pérez-Nombelaa S., 48
 Pérez-Rizo E., 48, 83
 Perin C., 98, 138
 Perisano C., 243
 Pernigo P., 96
 Perrero L., 82, 88, 136, 241, 242, 244, 245
 Perrone P., 232
 Perucca L., 253
 Pessina F., 271
 Pessotto P., 217
 Petrarca M., 226
 Petri E., 121
 Petrianos I., 55
 Petronic I., 21, 177, 181, 197
 Petropoulou K., 224, 228
 Petrovic S., 26
 Petrozzino S., 241, 242, 244, 245, 266
 Petrusic T., 26
 Petukhova V., 236, 237, 239
 Pfeifer K., 128, 190
 Piazzini D.B., 243, 244
 Piccinelli B., 133
 Piccione F., 149, 168, 185
 Picelli A., 74, 122, 124, 126, 127
 Pierallini A., 73
 Pierfederici L., 148
 Pietragalla V., 60
 Pi-Figueras M., 77, 121, 122
 Pigatto D., 183
 Pigatto M., 256
 Pignataro L., 258
 Pijlman C.P., 80
 Pimenta J., 204, 204
 Pimentel S., 13, 84, 189
 Pinar Borman., 121
 Pinsault N., 43
 Pinto F., 160
 Pinto M., 161
 Pinto S., 69
 Pinzini C., 101
 Pipolo V., 161
 Pirali F., 212
 Pirani G., 150
 Pirillo A.M., 89
 Piron L., 41, 160
 Pirscoveanu D., 31
 Pisa F.E., 130
 Pisano M.F., 102
 Pisciella V., 261, 262, 263
 Pisciotta C., 191
 Piscopo S., 161
 Pisev P., 213
 Pisoni D., 247
 Pissas A., 278
 Pistarini C., 271, 275
 Pistoni S., 63
 Pitkänen J., 47
 Pitrone B., 200
 Planas J., 76
 Plantone D., 113
 Platas Gabriel L., 159, 211
 Platas L., 153
 Plavšić A., 4, 6
 Ploumis A., 54
 Ploypetch T., 79
 Poenaru D.V., 169
 Poenaru D., 195, 200
 Poenaru D.V., 38, 168
 Poggi G., 179
 Polentarutti S., 238
 Poli P., 256
 Pollmann-Mudryj M.A., 46
 Polverelli M., 82
 Pop A.S.M., 203
 Pop M.S., 210
 Popa D., 38
 Popescu R., 54, 56, 69, 79, 80, 81, 98, 99, 163, 205
 Popescu S., 195, 200
 Popeskov S., 56, 108
 Popielarz S., 35
 Poposka A., 33, 71
 Popova Ramova E., 33, 71
 Popovic I., 266
 Popovici C., 115
 Porcellini G., 26
 Pornajaf S., 207
 Porohkina S., 191
 Portella V.R., 170
 Portinaro N., 264
 Portinaro N.M., 191
 Post M., 209
 Post M.W.M., 209
 Posteraro F., 159, 244
 Postiglione M., 129, 153
 Potic J., 158
 Pourmomeny A., 49, 69
 Pousette A., 251
 Prade S., 24
 Prat T., 76
 Prатели E., 163
 Prejbeanu R., 38
 Preobrazhenskiy V., 239
 Pressato L., 258
 Preston N., 60
 Preston N.J., 123
 Previnaire J.G., 86
 Prieur E., 278
 Primavera D., 129
 Primon D., 23, 106, 223, 225, 260
 Procopio C., 123
 Prodanović N.S., 158
 Provitera V., 200
 Psillaki D., 174
 Pterovic-Lazic M., 59
 Ptyushkin P., 44
 Puccetti A., 150, 151
 Puenea G., 38
 Puertas P., 121
 Pujia A., 152
 Pulkkinen L., 204
 Punzi L., 256
 Purcell M., 154
 Purmomeni A., 211
 Putignano P., 231
 Pyrgeli T., 201
- Q**
 Quarenghi A.M., 57
 Quartilho M., 190, 263
 Quarto L., 182
 Quattale R., 266
 Quattrocchi G., 268
 Quattrone D.A., 114
 Qudsi-Sinclair S., 90, 91
 Querques N., 117
 Quiriconi C., 71
 Quittan M., 173
- R**
 Rabini A., 243, 244
 Raczko L., 86
 Radaković N., 274
 Radosavljevic N., 183
 Radovanovic T., 54
 Radovanovic T., 77
 Radulović S., 62
 Radunovic G., 119, 186
 Raeesadat A., 207, 214
 Rahali H., 184
 Rahali-Khachlouf H., 58
 Rahimi A., 35
 Rahino A., 223, 230, 231, 232, 233
 Rahman S., 48
 Raicevic M., 21
 Rajabali S., 16
 Rama B., 146
 Ramada F., 210, 211, 215
 Ramirez-Garcera L., 166
 Ramírez-Sarmiento A., 183
 Ramonas A., 130
 Ramonda R., 256
 Ramos Solchaga M., 96
 Ramos Solchaga M., 96
 Ranaudo P., 24
 Rancić N., 144, 279
 Randsdorp M.S., 159
 Ranieri M., 60, 127, 140, 155, 248 254, 261, 270
 Rapidi C.A., 228
 Raspa R., 150
 Rasseneur L., 108
 Rastelli V., 116, 117, 118, 129
 Rastentye D., 33
 Ravaschio A., 210, 216
 Rayegani S.M., 162
 Razumov A., 249
 Razvan D., 104
 Recalcati M., 160

INDEX

- Reda A., 17
 Redmond H., 19
 Redolfi A., 145
 Rega A., 45
 Rega V., 98, 138
 Reggiani G., 269
 Regis D., 71
 Regis Ivar Carneiro J., 234
 Reiners V., 5
 Reis Costa H., 178
 Reni L., 191
 Repetto M., 67
 Resende M.J., 141
 Resino Luis C., 96
 Respizzi S., 123, 191
 Resta N., 270
 Restuccia D., 201
 Reuter A., 36
 Rey Pita L., 176
 Reynaert C.H., 7
 Rey-Pita M.L., 118, 155
 Reza Raissi G., 165
 Reza Raissi G., 56
 Reza Vafa M., 35
 Rezan Yorgancıoğlu Z., 121, 257
 Ribeira T., 198
 Ribeiro da Cunha M., 195
 Ribeiro M.M., 108, 178, 218
 Ricarte-Benedito T., 91
 Riccardo A., 12
 Ricci E., 109
 Ricci M., 273, 276
 Richard I., 51
 Richard R., 108
 Richarda I., 55
 Richardson B., 52
 Richardson P., 97
 Riera M., 76
 Rigam M., 178
 Rigano M., 73
 Rigaux P., 86
 Righetti P., 26
 Rinaldi G., 72
 Ristevska S., 71
 Ristic V., 266
 Rito C., 141
 Rivera F., 81
 Rivignani Vaccari A.M., 12
 Rizzetto A., 259
 Rizzi E., 241
 Rizzo A., 71
 Rizzo F., 24
 Rizzo R.S., 111
 Rizzuto N., 114
 Robustelli G., 111
 Rocca B., 70
 Rocco A., 118, 119
 Rocco L., 106
 Rocco M., 12
 Rocha J.A., 84
 Rocha P.G.O., 167, 170
 Rodaro E., 218
 Ródenas S., 80, 164
 Rodrigues., 188
 Rodrigues Xerez D., 234
 Rodríguez Nieva N., 233
 Rodríguez S., 167
 Rodríguez-González S., 166
 Rogoveanu O., 69, 79, 99
 Rojas M.F., 76, 77, 120
 Rojas Padilla M.F., 77
 Roma L., 253
 Romanelli E., 127, 254, 261
 Romano O., 188
 Romanovskaja Z., 136
 Romaschin A., 46
 Romeo A., 172
 Romero Torres D., 134
 Rommers G.M., 74
 Romon M., 57
 Rompe J.D., 2, 5
 Roncari L., 122
 Roncoletta P., 270
 Ronconi G., 243, 244
 Ronconi G.P., 243
 Rondinone C., 263
 Rondovic D., 132, 139
 Roque V., 166, 167, 189
 Rosa R., 71
 Rosado M.L., 141
 Rosati G., 256
 Rosati V., 34, 93, 94
 Rosato N., 240
 Rosee R.J., 204
 Roshanzamir S., 38
 Rosina S., 268
 Rossband F., 107
 Rossetti S.L., 184
 Rossi A., 256
 Rossi B., 119, 123
 Rossi M., 44
 Rossi N., 230
 Rossi S., 139, 222, 226
 Rossi S., 41
 Rossi V., 63
 Rossini M., 96, 196
 Rosso I., 124
 Rosulescu E., 98
 Rota V., 253
 Rousseaux M., 8, 57
 Roussos N., 78, 84, 97, 148
 Rovacchi C., 44
 Rovere G., 183
 Roy C., 151
 Rozhnevskaya E.P., 236
 Rubamchenko A., 21
 Rubay R., 278
 Rubino V., 89
 Rudakov B.E., 236
 Ruella C., 129
 Ruggeri A.E., 109
 Ruiu D., 98
 Ruíz S., 120
 Ruiz-Eizmendi A., 165
 Rukiye Yazıcı R., 121
 Rusca L., 179
 Russo A., 116, 117, 129
 Russo C.V., 200
 Russo G., 110, 111
 Russo R., 172
 Rusu A.M., 85
 Rusu L., 15
 Ruvina I., 211, 215
 Ruzzante B., 106
 Ryall N.H., 74
 Rybalko N.V., 1, 2
 Ryerson S., 8
- S**
 Şenel K., 155
 Šimšik D., 252
 Šikrbić R., 206
 Šolaja V., 105
 Šušak V., 51
 Sá L., 210, 211, 215
 Sabartés O., 77, 121, 122
 Sabater-Querol M.T., 90
 Sabatini F., 73
 Saberi H., 35
 Sabour H., 35
 Sabrina G., 76
 Saccavini M., 53, 271
 Saccavino P., 106
 Sacco V., 228, 229
 Saccomanno M.F., 244
 Saenko I.V., 27
 Saggini R., 261, 262, 263, 265
 Sahin F., 176
 Sakellariou V.I., 63
 Saima A.Y., 61
 Sakellariou V.I., 63, 64
 Sala N., 82
 Sale P., 88, 138
 Salek A.K.M., 44
 Salghetti A., 76
 Salgovic L., 134
 Sali A., 235
 Salle J.Y., 18, 22
 Salli M., 149
 Salminen J.J., 47, 68, 120
 Salminena J.J., 204
 Salotti E., 71
 Salsabili H., 16
 Saltychev M., 50
 Salvi G.P., 57
 Salvi I., 201
 Salvi M., 128
 Sambataro D., 72, 79
 San Segundo R., 80, 164
 Sanchez Enriquez J., 45
 Sanchez Fernandez R., 134, 156
 Sánchez M.D., 77, 121
 Sanchez Raya J., 197
 Sanchez Rodriguez D., 122
 Sandroni L., 276
 Sang Beom K., 91
 Sanguedolce G., 103
 Sanguinetti G., 78
 Sansam K., 74
 Santagada D.A., 244
 Santamaria V., 268
 Santamato A., 116, 117, 118, 129
 Santandreu Jimenez M.E., 45
 Santilli V., 153
 Santin M., 76
 Santini D., 135
 Santoni R., 150
 Santoro A., 143
 Santoro V., 138, 174, 212
 Santos S., 198, 246
 Santovito S., 117, 118
 Santus G., 212
 Sanverdi E., 65
 Saoner T., 149
 Saoud Z., 58
 Saraceni D., 149
 Saraceni V.M., 152, 153
 Saramantos J., 201
 Sarcinella M., 106
 Sari H., 133
 Sarraf T., 5
 Sarraj W., 58
 Sartorio F., 129, 134
 Sasa Moslavac S., 261
 Saul M., 235
 Saulino M., 19
 Savage J., 60
 Savas F., 161
 Savi Scarponi F., 112
 Savic V., 125
 Savičić D., 108
 Saviola D., 147
 Savoia V., 215
 Savoy J., 73
 Sawacha Z., 105
 Sayed Mohsen Mirbod, 178
 Sbarbati A., 96
 Scaglia F., 103
 Scaglione G., 151, 152
 Scalzo I., 89
 Scalzo L., 89
 Scano F., 249
 Scapin M., 183
 Scapolan S., 97
 Scapolo M., 106
 Scappaticci A., 153
 Scaramuzzi M., 231, 232
 Scaramuzzi M.R., 231, 233
 Scarano V., 200
 Scarlet R.G., 192, 193, 194
 Scarpetta F., 72
 Scavo G., 72
 Scelfo P., 18
 Scellini T., 203
 Schenone A., 114, 191
 Schieppati M., 251
 Schierano G., 241, 242
 Schiffer R., 37
 Schiffer R., 49
 Schirò G.R., 172
 Schmitz C., 5
 Schnider A., 8
 Schoenherr G., 222
 Schreuders T.A.R., 82
 Schuhfried O., 83
 Schuler M., 207
 Schwarz N., 36
 Schwarze M., 207
 Schwirtlich L., 218
 Sci M., 246
 Scialabba G., 182
 Sciarra T., 93, 187
 Sciuscio M., 140, 270
 Scognamiglio M., 161
 Scognamillo A., 40
 Scoppa E., 37
 Scoppa F., 49
 Scormaienghi B., 89
 Scott K., 235
 Scotti M., 139
 Scremin C., 106
 Sebastianelli M., 95
 Secil H.B., 161
 Sedaghat P., 37
 Seddighi A.S., 162
 Sedighipoor L., 162
 Segal N.A., 2
 Selivanov V., 91
 Sellan M., 121
 Sellas R.W., 82
 Selvanetti A., 162
 Semerjian M., 218
 Semprini R., 73, 138, 147
 Senel K., 197
 Sengul M., 54
 Sensi G., 30
 Sensini F., 248, 258
 Seo C.H., 190
 Seong Hoon L., 75
 Serap Y., 188, 199
 Sergi C., 246
 Sergi R.A., 24
 Sergi Rocco A., 24
 Serrao M., 180
 Servadei F., 253
 Servi A., 142
 Servodio Iammarrone C., 105
 Setola C., 200
 Sevilla Benitez M., 96
 Sevilla E.A., 221
 Sevilla-Hernández E.A., 165, 220, 221, 269
 Seyyah O., 161
 Sgadari A., 243, 244
 Sgarlata R., 151, 152
 Shabalina A., 213
 Shafshak T.S., 67
 Shaheen E., 67
 Shaik Ahmed., 264
 Shakoor A., 48
 Shakoor M.A., 44
 Shala N., 4
 Shapovalenkio T., 236
 Shapovalenko T., 25, 237, 239, 240
 Shapovalenko T.V., 236, 237, 238, 239, 240
 Shidfar F., 35
 Shin J., 144
 Shkodra X., 146
 Shrestha S., 273
 Shtark M.B., 28
 Siamos G., 228
 Sicari M., 246

- Sichinava N., 9
 Sidere M., 195
 Sidorenko E., 239
 Sidiyakina I., 25, 237
 Sidiyakina L.V., 237
 Sighinolfi A., 150, 151
 Signorello D., 22
 Sildiroglu O., 141
 Silva A.L., 84
 Silva Guimarães F., 234
 Silva P., 188
 Silvestri G., 110
 Silvestri W., 180
 Simanic I., 266
 Simeone C., 22
 Simeunovic S., 181
 Simone A., 253
 Simone V., 116, 117, 118, 129
 Simonini M., 164
 Sinevičius R., 136
 Singh J., 149
 Singh R., 276
 Sinkiewicz A., 99
 Sioutis I., 148
 Sioutis I., 78, 84, 97
 Siragna P., 24
 Sirico F., 153, 200
 Sivetidou S., 201
 Sizenando M., 204
 Sjölund B.H., 216
 Skala Kavanagh H., 51
 Skikic-Mujic E., 97, 156
 Sklyar M. M., 28
 Slavkovic A., 157
 Smania N., 52, 74, 96, 122, 124, 126, 127, 156, 160
 Smiderle C., 183
 Smirni L., 57
 Smolenski U.C., 34, 36
 Sobral-Ferreira M., 169, 170
 Sofianos I., 63
 Sojer M., 222
 Soler J.M., 86
 Solinas G., 90
 Solís Mozos M., 83
 Sollo M., 182
 Solonets I., 239
 Soo Choi J., 274
 Sörbo A., 123
 Sorce S., 268
 Soroker N., 220
 Sottini C., 76, 241
 Souayah A., 58, 184
 Sousa A., 87
 Sousa A.C., 141
 Soyupek F., 160
 Spadini E., 152
 Spaghetti I., 149
 Spagnolatti L., 230
 Spalevic M., 6, 7, 219, 234
 Spalević M., 144, 279
 Spallarossa P., 132
 Sparpaglione D., 131
 Spasic I., 197
 Spazzoli E., 217
 Specchia A., 243, 244
 Spence J., 46
 Spera G., 42
 Sperandio C., 135
 Spidaliere R., 135
 Spiegel M., 222
 Spiezia A., 12
 Spiridonos S., 64
 Spolaor F., 105
 Spolaore L., 41
 Springhetti I., 139, 222
 Sremčević N., 61, 62
 Srisawasdi G., 47, 83
 Stablum F., 145, 180
 Staderini E., 192
 Stähla M., 204
 Stam H.J., 82, 139, 252
 Stamatakis G., 174
 Stamenovic J., 47
 Stampacchia G., 78, 119, 266
 Stancati M.T., 180
 Stancila D., 133, 247
 Stankovic A., 87, 219, 234
 Stankovic I., 6, 7, 47
 Stasi M.F., 198
 Stavrianakis D., 39
 Stea C., 62
 Stecco A., 255
 Stefanovic A., 218
 Stefanovski G., 75, 206
 Stefanovski M., 75, 107
 Sterzi S., 135, 136
 Stevanović-Papić D., 105
 Stigliano V., 133
 Stissi V., 134
 Stival G., 217
 Stoicanescu D., 86, 87
 Stojanovic N., 103, 104
 Stojanovic Olivera I., 234, 260
 Stojanovic R., 177
 Stojicic-Djulic S., 68
 Stori A., 254
 Storti G., 267, 268
 Storti I., 127
 Storti M., 267, 268
 Stradella C., 183
 Strasser E.M., 173
 Straûar K., 279
 Straudi S., 216
 Streian C., 101
 Stucki G., 17
 Stucki G., 209
 Stuit A., 22
 Subaih Z., 78
 Suci O., 38
 Suci S., 202
 Sukalo R., 56
 Sultan H.A., 60
 Sunnerhagen K.S., 123
 Suominen C., 68, 187
 Surducun D., 38
 Surian L., 88
 Susic G., 177
 Suwannakin A., 47
 Suzon Al Hasan., 264
 Svenda-Zlatkovic M., 119
 Szulkowska K., 20
 Szymkuć I., 99, 266
- T**
 Tacchini V., 82
 Tacchino A., 191
 Tae-Ho J., 75
 Tagliente V., 229, 270
 Taheri N., 211
 Tajziehchi A., 36
 Takahashi H., 4
 Talebian S., 51
 Tali M., 126
 Tamburin S., 126
 Tamburin S., 127
 Tamulaitienė M., 136
 Tancredi G., 119, 244
 Tang S.F.T., 65
 Tanovic E., 165
 Tanovic H., 165
 Tarasevich A.F., 28
 Taricco M., 224, 225
 Tariqul Islam M., 44
 Tarraghi M.R., 162
 Tartaglia S., 161
 Taşkaynatan M., 66
 Tascioglu F., 189, 190
 Taskın S., 54
 Tatar I., 102
 Tataranno A., 135
 Taveggia G., 125
 Tavoni M., 106
 Tayebi M.G., 40
 Tebaldi F., 72, 180
 Tecco J., 7
 Tederko P., 20
 Teixeira Z., 39
 Tejero Sánchez M., 77
 Teleianu C., 200
 Telenkov A.A., 68, 147
 Tenaglia M.L., 51S., 197
 Tennant A., 115
 Tennant A., 77, 99, 252
 Tenore N., 157
 Teodorani G., 83
 Teofilovski M., 266
 Ter Minassianc A., 55
 Terek M., 177, 186
 Terranova A., 199, 200
 Terrier P., 92
 Terzolo G., 182
 Tesio L., 253
 Tessari A., 218
 Tessari P., 40
 Tessiot C., 51
 Testa A., 135, 196, 219
 Testoni S., 133, 135
 Thanakiatpinyo T., 83
 Théry J.M., 107
 Thevenon A., 35
 Thirapatarapong W., 57
 Thomas V., 7
 Thonnard J., 122
 Tibaldi V., 198
 Tiberti M., 147
 Tien Wen C., 141
 Tiepolo R., 179
 Tiozzo M., 168
 Tirelli A., 161
 Tirelli C., 153
 Tofanicchio M., 48, 192
 Tognetti P., 164
 Togni G., 195
 Tolin M.T., 156
 Tölli A., 123
 Tomanovic S., 77, 173
 Tomasino B., 101
 Tomassini M., 270
 Tomelleri C., 21
 Tomescu M., 102
 Tomescu M.C., 101
 Tomic M., 266
 Tommasi E., 71
 Tonali P., 113, 114
 Tonali P.A., 110
 Tondi G., 127, 140, 254, 261
 Tong Z., 235
 Tonin K., 279
 Tonin P., 41, 168, 248, 258
 Topolovec-Vranic J., 46
 Tordeurs D., 7
 Torii Y., 194
 Tornatore G.P., 201
 Toro P., 228, 251
 TorralbaPuebla T., 176
 Tosi L., 135
 Tosic-Golubovic S., 26
 Toste S., 106, 171
 Toste T., 13
 Totorean A., 168, 169
 Tovar-Felice M., 202
 Träistarar R., 79, 80, 81
 Traballese M., 145
 Tragoulias V., 174
 Traistarar R., 69, 163, 205
 Tralli R., 254
 Tramontozzi R., 162
 Tranquilli C., 48, 192
 Trebinjac S., 97, 156
 Trêpa A., 106, 120, 171
 Trevisan G., 223
 Trevisi E., 76
 Trifan F., 31
 Trifirò R., 268
 Tripaldi E., 231, 232, 233
 Tripkosh S., 240, 240
 Trocsanyi M., 55, 75
 Troev T., 185
 Trombetta C., 240
 Troncati F., 149
 Trovas G., 39, 46
 trovato P., 267
 Trovato P., 267, 268
 Trukhacheva N., 260
 Tsibidakis H., 63, 64
 Tsivgoulis A., 228
 Tsouparopoulos V., 63, 64
 Tsou V.I., 240
 Tsuchimoto K., 194
 Tucci L., 153
 Tudela-Salom ., 91
 Tudorica V., 31
 Tudosie A., 195
 Tuiliere T., 55
 Tûlay E., 188, 199
 Tuniz D., 121
 Tuominen R., 68, 187
 Turolla A., 41, 160
 Tüzün Ş., 273
 Tuzzi A., 172
- U**
 Uliano D., 203
 Ullattuthodiyil S., 156
 Uludag M., 133
 Un Jang K., 274
 Ungur R., 202
 Urbano E., 199
 Urgesi C., 101
 Uriarte Urizar J., 207
 Ursig P., 121
 Ursino S., 216
 Urso G., 223
 Ursoniu S., 142
- V**
 Vacariu G., 83
 Vacas R., 153
 Vahab Kashani R., 207
 Vahlberg T., 47
 Vahtera J., 50
 Valarini S., 256
 Valdenassi G., 3
 Valdés M., 80, 164
 Valentino T., 71
 Valeriani M., 113
 Vallante C., 57
 Vallasciani M., 128, 207, 270
 Vallone F., 67
 Valorio P., 241
 Valsecchi L., 57
 Valvo S., 219
 Van de Velde D., 225
 van den Berg-Emons H.J.G., 252
 van der Sande R., 159
 Van der Woude L.H.V., 209
 van Grinsven D., 191
 Van Hedel H., 209
 Van Hove G., 225
 van Middelkoop M., 159
 van Pruijssen-Romijn A.N.G., 82
 Vanderstraeten G., 225, 253
 Vangelista A., 160
 Vanini M., 269
 Vannicola A., 179
 Varagic-Markovic S., 173, 211
 Varako N.A., 1
 Varalta V., 122, 126, 156
 Varnienė L., 137
 Varnier A., 238
 Varvarousis D., 54
 Vasić J., 4, 6

INDEX

- Vasileiadis G.I., 55
 Vautravers P., 108
 Vaz R., 218
 Velasco-Zarzuelo M., 165
 Veliaj A., 129
 Veljkovic D., 103, 104
 Vendramin A., 41, 160
 Venkateshwara G., 276
 Ventura V., 152
 Venturini E., 216
 Venza C., 82, 103
 Vercelli S., 129, 134
 Verdíé-Kessler C., 22
 Vermesan D., 38
 Vermesan H., 38
 Vermiglio G., 199, 200
 Vermiglio M., 199, 200
 Verzi S., 246
 Vescera M.A., 128
 Vesco S., 257
 Vesovic Potic V., 54, 68, 158, 173, 211
 Vesovic-Potic X., 77
 Viaene A., 253
 Viapiana O., 96
 Vidakovic-Maksimovic B., 266
 Vidmar G., 44, 133, 279
 Viggiano M., 129
 Vigo G., 92
 Viliani T., 154, 163
 Villafruela I., 115
 Villani C., 131
 Villarino C., 150
 Villaverde R., 221
 Vimercati S., 157
 Vincenzi M.T., 112
 Vita G., 114
 Viton J.M., 249, 280
 Vittore D., 140, 155, 270
 Viva E., 25
 Vivaldi N., 245
 Vlad A., 133, 145
 Vlajkovic M., 157
 Volanti P., 181, 182
 Vollono C., 113
 Volpe D., 71
 Voltazza A., 125, 130
 Von Elm E., 209
 Voronov A.V., 68, 147
 Vozza V., 259
 Vuillerme N., 43
 Vujaković S., 108
 Vujnovic D., 139
 Vukicevic M., 272
 Vukicevic M., 272
 Vukomanović A., 213
 Vukotic M., 181
 Vukov V., 54
 Vukovic M., 59
 Waldner A., 21, 52, 124
 Waligórski S., 92
 Ward A.B., 149, 175
 Wasiak K., 20
 Weber G., 68
 Wegener S., 137
 Weightman A., 60
 Weightman A.P.H., 123
 Weil L., 5
 Weis L., 101
 Weiss, J.J., 5
 Weller R., 100
 Werner C., 21, 52, 124
 Werren M., 121
 Wosiakowska D., 20
 Wynants B., 211
 Xenaki M., 274
 Xerez D.R., 164, 167, 170
 Yıldırım A., 264
 Yagci I., 215
 Yanik T., 32
 Yasar E., 187, 188
 Yavuz F., 187
 Yavuzer G., 139, 229
 Yazıcı R., 257
 Yazıcı R., 66
 Yazicioglu K., 66
 Yazicioglu K., 3, 32
 Ye Rim C., 75
 Yelkovan M., 161
 Yigit H., 120
 Yıldırım A., 263
 Yıldız S., 160
 Yilmaz B., 187
 Ylli A., 4
 Yong Bum P., 100
 Yoshinov R.D., 185
 Youn Lee J., 274
 Youn Y., 144
 Young Jin K., 75
 Young-Sup K., 75
 Yurova O., 249
Z
 Živanić D., 205
 Zaccala M., 179
 Zaccari T., 150
 Zacchini S., 183
 Zadmeher H., 49
 Zagorac S., 68
 Zaharia C., 31
 Zaina F., 143
 Zaina F., 74
 Zak E., 184
 Zaliani A., 129
 Zamagni M., 248
 Zambelan G., 154
 Zambito A., 96, 124, 127
 Zambuto A., 140
 Zampa A., 101
 Zampolini M., 266
 Zanardi G., 101
 Zanardo C., 218
 Zanasca L., 106
 Zancan A., 131, 139, 222
 Zanella C., 232
 Zanelli G., 226
 Zanette G., 126
 Zanga C., 275
 Zanga C., 275
 Zani G., 249, 253
 Zanotti D., 241
 Zappalorti P., 135
 Zardi E., 224, 225
 Zaro F., 128
 Zavaleanu M., 98
 Zdanowicz N., 7
 Zdravkovic M., 54
 Zecchini F., 201
 Zeinolabedini R., 15
 Zeki Kiralp M., 215
 Zeme S., 76
 Zenorini A., 74
 Zeqiri N., 4
 Zeqiri S., 4
 Zheleva M., 143
 Zhou Z., 18
 Zimina E.V., 1, 3
 Zinoviev O., 239
 Zivanić D., 222
 Zivkovic V., 157
 Zlatanovic M., 119
 Zlatkovic-Svenda M., 186
 Zoboli D., 230
 Zollo L., 136
 Zsiga K., 55
 Zuccher P., 122
 Zuliani C., 41, 45
 Zulliani C., 23