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Abstracts from the 8th World Congress of the International Society of Physical and Rehabilitation Medicine
XXII CONGRESO MEXICANO DE MEDICINA FISICA Y REHABILITACION

Provided here are the abstracts of scientific papers and posters that were presented at the 8th World Congress of the International Society of Physical & Rehabilitation Medicine (ISPRM), June 1-5, 2014, Cancun Center, Mexico. These abstracts have not undergone peer review by PM&R.

ORAL PRESENTATIONS
CANCER REHABILITATION

No. 1 Clinical Study to Assess the Efficacy of Pre-Operative Training on Histomorphometry and Muscle of Pelvic Floor Muscle in Patients Undergoing Radical Prostatectomy.
Robinson Ramírez-Vélez; Ángela Ocampo-Tuñíjlo; Carlos Andrés Muñoz-Zuluaga.

Disclosure: None. Objective: To evaluate the efficacy of preoperative pelvic floor muscle training (PFMT) on histomorphometry and muscle function of patients undergoing radical prostatectomy (RP). Design: A prospective intervention clinical study. Setting: Tertiary care oncology centre. Participants: 16 male. Interventions: The intervention group (n=8) received a training session with PFMT supervised three times a day three session for week 30 days before the RP. The control group (n=8) received oral and written instructions to be performed at home (lifestyle modifications). Main Outcome Measures: Before and after the intervention we evaluated muscle function of the external urethral sphincter and contraction pressure of the levator ani. At the end of the intervention and day of the surgery muscular tissue samples residual external sphincter muscle of urethra for histomorphometric analysis. Results: After the intervention participants who performed PFMT showed increased cross-sectional area of the muscle fibers of the external urethral sphincter (1313±1075 μm² vs. 1056±844 μm²; p=0.03) and higher pressure contraction of the levator ani (I=9.188 p=0.010). Conclusions: Early PFMT induces changes in the histology and function of the pelvic floor muscles. These results provide new evidence of the benefit of PFMT in preventing complications associated with RP.

No. 2 The Effect of Aerobic Exercise on Quality of Life Among Breast Cancer Survivors: A Randomized Controlled Trial.
Adriana Murtezani; Zana Ibraim; Aurora Bakalli; Shaip Krasniqi.

Disclosure: None. Objective: To determine the effect of moderate-intensity aerobic exercise on quality of life (QoL) and physical functioning in breast cancer survivors. Design: Randomized controlled study. Participants: We randomly assigned 62 breast cancer survivors to an exercise (n=30) or control group (n=32). The exercise group trained at a moderate intensity progressing from 25 to 40 minutes over a 10 week period. The control group did not train. Main Outcome Measures: Outcomes were assessed at baseline and post intervention. The primary outcomes were overall QoL - as assessed by the functional assessment of cancer therapy-breast (FACT-B) scale. Secondary outcomes were changes in various subscales of overall QoL and changes in body composition outcomes; body weight body mass index and changes in performance in a 12 minute walk test (12MWT). Results: Sixty-two of 73 women randomized (84.9%) completed the study. There were no significant differences amongst the two groups at baseline for any variable. In the exercise group significant improvements was demonstrated for the FACT-B (13.4 points p<0.003) functional assessment of cancer therapy-general (FACT-G) (9.16 points p<0.008) the functional well-being subscale (p<0.010) and the emotional well-being subscale (p<0.035) compared to the control group. No significant changes in body weight or BMI were observed. Exercise group showed a significant increase in 12MWT (p<0.009). Conclusion: We conclude that 10 weeks of moderate-intensity aerobic exercise program significantly improves QoL and physical functioning in breast cancer survivors. Future studies are needed to evaluate the effectiveness of similar exercise programs over longer periods of time and involving a greater number of breast cancer survivors.

CARDIO-PULMONARY REHABILITATION

No. 3 Application of the CAT to Patients With Interstitial Lung Disease.
Fujiko Someya, MD; T. Nakagawa, MD; Y. Motozaki, MD; N. Mugil, OTR.

Disclosure: None. Objective: We applied a recently developed health status assessment test designed for chronic obstructive pulmonary disease (CAT) to patients with interstitial lung disease and examined the relationship between the CAT score and pulmonary function and oxygen saturation similar to preexisting questionnaires that revealed a correlation with pulmonary impairments. Design: Retrospective study. Setting: Division of rehabilitation university hospital. Participants: 27 consecutive patients with interstitial lung disease underwent a closer physical examination in 2013. Intervention: The CAT (with a score ranging between 0 and 40) has a higher score representing a worse health status) which consisted of eight simple items regarding the health status of patients was completed on the first day of the visit. Main Outcome Measures: The CAT score pulmonary function test oxygen saturation at rest and after submaximal exercise blood gas analysis and the administration of oxygen therapy. Results: A correlation (r value) was observed between the CAT and percentage of predicted forced vital capacity (r=0.59), forced expiratory volume in 1 second (r=0.50), and total lung capacity (r=0.52) but not with the diffusion capacity of carbon monoxide. The CAT score was higher in patients with oxygen desaturation (≥4%) during submaximal exercise up to 6 minutes than in those without oxygen desaturation (p=0.0012). The partial pressure of oxygen in arterial blood in room air oxygen saturation at rest with oxygen supplementation depending on the treatment and home oxygen therapy did not affect the CAT score. The reliability of items of the CAT was 0.86 by Cronbach’s alpha coefficient which indicated adequate internal consistencies. Conclusions: The results obtained in the present study indicated that the CAT may represent a candidate for evaluating the health status of patients with interstitial lung disease similar to preexisting questionnaires. Reprinted with permission.

No. 4 Cardiac Rehabilitation Adherence as a Determinant of Cardiovascular Disease Burden After ACS.
José Miguel Sandovala; Hugo Amorim; Rui Cadilha; José Afonso Rocha.

Objective: Adherence to cardiac rehabilitation (CR) in acute coronary syndrome (ACS) patients has been shown to exert positive effects. We sought to compare baseline characteristic of adherent (A) non-adherent (Na) and establish the prognostic impact of CR non-compliance over cardiovascular morbidity and mortality. Design: Retrospective study. Setting: CR unit. Participants: 505 consecutive patients referred to CR after an ACS.
Interventions: No. Main Outcome Measures: Sociodemographic and clinical data. Psychosocial status and quality of life assessed using HADS and SF-36 respectively. Data on mortality and morbidity outcomes collected from hospital records and a nation-wide health data platform. Non-adherence to CR was defined as completing less than 30% of programmed exercise sessions. We used a composite outcome (all cause mortality new hospital admission for ACS stroke and CHF and/or revascularization procedures). Level 1 of evidence. Results: In the study population 460 (86.9%) were male with mean age 54.7±9.8. We found 56 (11.1%) non-participating in 6±4±3 exercise sessions. No was more common in women (21.4% vs a:12.0%; p=0.04) those living alone (32.1% vs a:12.7% p<0.01) and those unemployed (27.3% vs a:16.3% p<0.01). Except for previous ACS history (p=3.5% vs a:14.5% p<0.01) there were no between-group differences regarding classic cardiovascular risk factors. Mean follow-up time was 29 ±±18 ±1 months and a total of 46 events were identified (3 deaths 2 strokes 2 CHF admissions 26 revascularizations procedures (RP) and 13 ACS not submitted to RP) more frequently in non-adherents (Na:11(19.6%) vs a:35(7.8%) at a mean time of 29.5±±18 ±1 months. CR adherence status was a predictor of composite adverse outcome on univariate analysis (hr 2.4 95%ci 1.2-4.8). After logistic regression multivariate analysis adjusted for other relevant covariates (age sex history of previous ACS) non-adherence to CR was associated with a 9-fold higher risk of developing the composite adverse outcome (CI 1.1-4). Conclusions: CR non-adherence associates with higher risk of cardiovascular morbidity and mortality after an ACS.

No. 5 Pulmonary Rehabilitation Outcome in Patients After Single or Double Lung Transplantation.
Evrnen Atabas; Tessa Schneeberger; Klaus Kenn.

Introduction: Pulmonary rehabilitation (PR) following lung transplantation (LT) can be seen as an established therapeutic modality. However differences concerning the efficiency of rehabilitation procedures in patients with single (SLT) or double (DLT) lung transplantation have barely been studied yet. Methods: The data of 550 patients suffering from chronic obstructive pulmonary disease (COPD) or interstitial lung diseases who underwent PR after SLT (n=212; age 58±6) and DLT (n=338 age 53±8) during the years 1997 to 2013 were retrospectively analysed. All patients underwent a standardized inpatient PR program of about 41±18 days in average. Data of 6-minute walking distance (6MWD), health related quality of life (HRQoL) (physical [PCS] and mental [MCS] component summary of the SF-36 questionnaire) and adverse events during PR have been registered and analyzed. Results: In SLT patients 6MWD increased from 267±134 to 381±120 (p<0.001). PCS from 32±9 to 39±10 (p>0.001) and MCS from 40±17 to 48±15 (p<0.001). In DLT patients 6MWD increased from 284±144 to 412±126 (p<0.001), PCS from 27±11 to 35±10 (p>0.001) and MCS from 41±16 to 50±14 (p<0.001). The improvement of 6MWD in the DLT-group was significantly (p<0.005) higher than in the SLT-group. Benefits in HRQoL were comparable in patients with SLT and DLT (p>0.05). The frequency of complications was similar in both groups with bacterial infections occurring with 16.5% in the SLT-group and 20.4% in the DLT-group and virus infection (cytomegaly) with 13.2% SLT and 9.2% DLT. Conclusion: Our results show that patients significantly benefit from a comprehensive PR program performed immediately after LT. While HRQoL improved in similar degree in both groups the DLT-group showed superior improvement in exercise capacity (6MWD) in comparison to SLT. PR programs are therefore a medically sensible procedure after LT.
No. 16 Prevalence of Burnout Syndrome and Related Factors in Workers in a Children’s Rehabilitation Center in Mexico.

Morales Martínez Daniela; López Valencia Ana Karina; Castilléjos López Manuel De Jesús.

Objective: Determine the prevalence of burnout syndrome and related factors among the workers in a rehabilitation center. Design: Prevalence survey. Setting: A children’s rehabilitation center in Mexico. Participants: Workers in a rehabilitation center. From 106 eligible subjects 10 did not attend the invitation to complete the survey. 4 were out of the workplace, and 3 were temporary workers. Of the remaining 89, three were excluded for not signing the informed consent and 1 for being part of the research. 85 participants (physician, therapists, psychologists, nursery, social workers, home service special projects and volunteering) completed the self-administered survey which consisted of one questionnaire of demographic data the Maslach Burnout Inventory the Beck Depression Inventory for assessing depression and the audit scale for alcoholism. Interventions: Not applicable. Main Outcome Measures: Maslach Burnout Inventory (depersonalization, emotional exhaustion and personal accomplishment computed separately) Beck Depression Inventory and audit scale for alcohol. Level of Evidence: Level 1. Results: The median of age was 30 years. 11.9% were men and 88.1% were women. Of all participants 12.9% showed moderate emotional exhaustion and 12.9% showed a high degree. 10.6% were moderate depersonalized and 5.9% highly depersonalized. Only the half of the participants showed high personal accomplishment (56.5%) and it was low in 18.8% of the workers. The prevalence of burnout syndrome was 49.4% while 20% have some degree of depression and 6 subjects were alcohol drinkers at risk. None of the main outcomes related to demographic variables. Conclusions: The burnout syndrome is high among people who work in the area of rehabilitation. Because of this it is necessary to adopt measures to avoid the development of this pathology and assess the evolution. These results correspond with other studies conducted in Mexico in medical staff.

No. 17 Efficacy and Safety of AbobotulinumtoxinA (Dysport®) in the Treatment of Adults With Upper Limb Spasticity: Randomized Double-Blind Placebo-Controlled Phase III Study.

Jean Michel Gracies; Allison Brashear; Robert Jech; Philippe Picaut.

Disclosures: AbobotulinumtoxinA is not approved by the FDA for the treatment of upper limb spasticity. JMG: consultant/research support (Allergan, Ipsen, Merz). AB: consultant (Allergan, Ipsen, Merz, XenonPort, Concert), research support (Allergan, Merz, Ipsen, NINDS). RJ: consultant/research support (Ipsen, AbbVie, Medtronic). PP: Ipsen employee.

Objective: To assess the efficacy and safety of abobotulinumtoxinA (Dysport®) in hemiparetic adults with upper limb spasticity (ULS) post stroke/trumatic brain injury. Design: Randomized placebo-controlled double-blind study. Setting: 34 sites in 9 countries. Participants: 243 adults aged 6 months post stroke/trumatic brain injury. Interventions: Randomization (1:1:1) to abobotulinumtoxinA (500 or 1000U) or placebo (single treatment cycle). Main Outcome Measures: Muscle tone (Modified Ashworth Scale [MAS]) passive function (Disability Assessment Scale [DAS]) active function (active range of motion [AROM] case of applying splint Modified Frenchay Scale [MFS]), overall clinical benefit (Physician Global Assessment [PGA]). Level of Evidence: 1. Results: Four weeks post injection 73.8% (500U) and 78.5% (1000U) of patients were responders determined by DAS ≥ 1 grade improvement versus 22.8% (placebo); p<0.0001. 50% (500U) and 62% (1000U) of patients responded as determined by DAS ≥ 1 grade decrease for their principal target of treatment versus 39.2% (placebo). Patients increased their mean (SEM) AROM at both doses (500U/1000U) versus placebo: against finger flexors (+12.6° (+6.4°/15.8°) versus -6.2° (5.3°)) elbow flexors (+12.6° (+4.4°/15.8°) versus 2.7° (3.1)) and wrist flexors (+15.7° (+6.0°/26.4°) versus 3.5° (7.3)). Use of splint was assessed as easier in both active groups and MFS scores trended positive but not statistically significant. Overall clinical benefit (PGA ≥ +1) was observed in 75% and 87.3% of the patients versus 40.5% (placebo). The safety profile was as expected. Conclusions: AbobotulinumtoxinA (500/1000U) injected into upper limb muscles improved muscle tone passive and active function in hemiparetic adults with ULS at week 4. Safety profile was consistent with the known profile of abobotulinumtoxinA in this disorder.

No. 18 Visual Dependence After Stroke: A Multi-Dimensional Concept.

Alain Yelnik; Sophie Tasseil-Ponche; Isabelle Bonan; Pierre-Paul Vidal.

Objective: Visual dependence (VD) often observed after stroke has to be taken into account for rehabilitation as it could have a negative impact on balance. Various tests are designed to evaluate VD. The aim of this study was to compare two of these tests with the hypothesis that the results could be not correlated as they examine different physiological functions. Design: Monocentric prospective study. Settings: A PRM department. Participants: 84 patients were enrolled 45 ± 30 days after a unilateral hemispheric stroke: 55 ± 10 years, 65% ischemic, 51% of right lesion, 65% men, functional impairment measurement 79 ± 26/126. 60% of patients had a sensory impairment, 11% a visual field defect, 35% a visuospatial neglect, 44% were able to walk without human assistance. Intervention and Measures: The first test was the adjustment of a luminous rod to the vertical position after a tilted framework using the rod and frame test (RFT). Parameters recorded were the tilt and the uncertainty. The second test was a sitting posture on a dynamic force platform under optokinetic stimulation. Parameters recorded were the tilt of the body and the stabilization reaction. The correlation analysis between tilt data and between variability data was made using Spearman rank correlation coefficient. Level of Evidence: 2. Results: There were no correlations between the two tests for all patients neither in subgroup analysis according to the main clinical features. Conclusion: These two tests are very different and not correlated in a post-stroke population. The RFT is a cognitive task assessing the VD for perception of verticality; the second test is a postural task evaluating the effect of dynamic visual disturbance. Visual dependence is not an absolute concept but is depending on the task. The exact impact of each kind of VD on balance has to be investigated.

No. 19 Upper Limbs Post-Stroke Robotic Rehabilitation.

Daniel G. Goroso; Thais Terranova; Denise R. Tsukimoto; Linamara R. Battistella.

Background: The number of experimental approaches that attempt to understand how to improve the neuroplasticity through rehabilitation techniques is increasing. Robotic devices intend to assist patients who have total or partial sensory-motor loss. However, studies are needed to identify an ideal treatment. Objective: To understand the role of two robotic systems for upper limbs in the rehabilitation process of post-stroke patients. Design: Randomized controlled study. Materials: One robot is suitable for wrist rehabilitation (InMotion3) and the other for shoulder-elbow rehabilitation (InMotion2) Participants: Twenty post-stroke patients with at least 6 months of the injury occurrence participated in this research. Seven patients were randomly allocated to form group A (GA) training with the InMotion2 robot focusing on the shoulder-elbow and training InMotion3 focusing on the wrist training on alternate days during 36 sessions. The thirteen remaining patients formed group B (GB) who trained with the InMotion2
The rehabilitation task consisted of a series of point-to-point movements with each robot. Both groups received the same amount of conventional therapy sessions. **Main Outcome Measures:** The performance between the groups before and after the robotic therapy was evaluated by scores of: Fugl-Meyer (FM), motor active log (MAL), Wolf Motor Function Test (WMFT), Functional Independence Measure (FIM), stroke impact scale (SIS), arm motor ability test (AMAT), and kinematic variables. **Result:** I) both groups have a more significant gain (p < 0.05). II) the gain is greater in GB than in GA (p < 0.05). III) the most sensitive scales to assess rehabilitation intervention robotics are: FM, WMFT, AMAT. IV) the scale WMFT and AMAT has correlation with the temporal parameters measured by own robot. **Conclusions:** It is expected that the results of this study will enable us to define a tailored therapy according to patient’s particular needs.

**NEUROLOGICAL REHABILITATION**

**No. 20 Development and Evaluation of a Multidisciplinary 8-Week Health Promotion Program for Chronic Stroke Survivors.**

Seung Hee Ho; Jung-Kook Kim; Jiye Baek; Seo Jin Yang.

**Objective:** This study was conducted to develop and evaluate a multidisciplinary 8-week health promotion program for chronic stroke survivors in Korea. **Design:** One-group pre-post test. **Setting:** Community-dwelling chronic stroke survivors. **Participants:** Thirty-five (27 men 8 women; aged 60-74-8 38 years old; 11.5 ± 6.55 years since the onset; 21 right hemiparesis 14 left hemiparesis; 22 ischemic stroke; 13 hemorrhagic stroke) community-dwelling chronic stroke participants in the program. **Interventions:** The multidisciplinary 8-week health promotion program was developed to improve rehabilitation for chronic stroke survivors. All subjects participated in the once-a-week eight-week program combining education and exercise components for 90 min. The education component consisted of providing stroke related information and helping them better manage nutrition stress and life habits. The exercise component incorporated fitness, strength, mobility and balance trainings. In addition the short message service (SMS) was provided individually to encourage and motivate the participants regarding lifestyle modifications. **Main Outcome Measures:** Stroke-specific functions were assessed using the Stroke Impact Scale (SIS) and the National Institutes of Health Stroke Scale (NIHSS). Functional performance was measured by the Berg Balance Scale (BBS), the six minute walk test (6MWT) and the Timed up and go (TUG) test. Quality of life was estimated using the EuroQol 5-Dimension questionnaire (EQ-5D). **Results:** There were significant reductions in NIHSS (p=0.002) and TUG (p<0.001) and an increase in BBS (p<0.001) and EQ-5D (p=0.027). The mean SIS scores of all domains and 6MWT were improved but the differences were not significant (p>0.05). **Conclusion:** We concluded that the multidisciplinary 8-week health promotion program which incorporated physical activities and education could help chronic stroke survivors improve both physical functioning and health-related quality of life and that this program could potentially save much of healthcare expenditure for chronic stroke survivors.

**No. 21 Valoración de la Espasticidad Independencia y Calidad de Vida en la Lesión Cerebral Crónica tras Infiltración con Toxina Botulinica.**

Idoya Barca; Adriel Cuevas; Concepcion Cuenca; Rocio Vacas.

**Objetivo:** Revisar la evolución de pacientes en tratamiento rehabilitador que presentan espasticidad severa secundaria a daño cerebral durante dos años de tratamiento con toxina botulinica asociada a fisioterapia y evaluar de manera subjetiva y objetiva cómo afecta la mejoría de la misma en la calidad de vida e independencia para sus actividades diarias así como en el manejo por el cuidador principal. **Diseño:** Estudiamos la variación de la espasticidad tras infiltración de toxina semestralmente y su impacto en calidad de vida funcionalidad articular y muscular y dolor mediante escalas. **Variables:** Sexo edad causa intensidad y localización de espasticidad tiempo de evolución dosis y lugar de infiltración. **Ubicación:** Consultas externas de hospital de primer nivel. **Participantes:** Pacientes que acuden a consulta con espasticidad de más de un año de evolución. **Causas:** Parálisis cerebral infantil (2) infarto cerebral (3) y traumatismo craneal (3). Edades entre 21 y 65 años. Cuatro varones. Seguimiento de dos años. **Intervenciones:** Infiltración de toxina botulinica en los músculos espásticos. **Principales medidas de resultados:** Exploración física y escalas calidad de vida SF-12 actividades diarias Barthel independencia funcional FIM valoración motora Fugl Meyer dolor eva y impacto en cuidador principal. **Nivel de Evidencia:** 2. Resultados: Encontramos mejora en puntuaciones de escalas obtenidas tras tratamiento tanto de función de miembros superiores (3 pacientes) marcha (dos pacientes) percepción estética (dos pacientes) actividades diarias (3 pacientes) dolor (4 pacientes) y calidad de vida (6 pacientes). En todos los casos el cuidador principal se mostró contento con los resultados. **Conclusiones:** Existe asociación entre mejora de espasticidad funcionalidad y calidad de vida de los pacientes. Es fundamental una correcta exploración y valoración previa y posterior a la infiltración así como dar pautas de ejercicios y consejos.

**No. 22 Impact of Early Occupational Therapy on the Cognitive and Functional Recovery in Adult Patients with Traumatic Brain Injury in Chile.**

Sandra Olivares, OT; Javier González, SLP; Claudio Soto; Daniel Muñoz, MD, MSc.

**Disclosure:** None. **Objective:** To evaluate the impact of early occupational therapy (OT) in a cohort of patients with traumatic brain injury (TBI) **Design:** Retrospective cohort study. **Setting:** Trauma and rehabilitation referral center in Santiago Chile. **Level of Evidence:** Level II. **Participants:** 106 patients with TBI who started OT interventions in intensive care unit (ICU), intermediate care unit (INCU), or medicine care unit (MCU). **Interventions:** An early OT rehabilitation program was applied (environmental management, cognitive stimulation, activities of daily living training, postural management and early mobilization) as part of a multidisciplinary program of TBI patient care. **Main Outcome Measures:** Onset of rehabilitation variation (final versus initial) of functional motor level (FML) and Rancho de Los Amigos (RLA) scale, disability rating scale (DRS), functional independence measure (FIM), Montreal cognitive assessment (MOCA), frontal assessment battery (FAB) and Loewenstein occupational therapy cognitive assessment (LOTCA). **Results:** At the end of the OT program all patients improved results in RLA, MOCA, DRS and FIM (p=0.006 each). Analyzing each services patients in INCU obtained higher recovery especially in MOCA scale (p=0.016). Patients who received the early onset intervention had a better cognitive and functional performance according to ERLA (p<0.001), FIM (p<0.001), DRS (p=0.006) and FAB (p=0.038). A 72.7% of ICU patients who started with supine level in FML presented a statistically significant improvement in this variable. At the end of the program an increase in FML was observed being patients who started at INCU the largest number of subjects who achieved gain level in relation to the initial level (71.43% versus 19.05% p<0.001). **Conclusions:** Early occupational therapy may have an impact on the cognitive and functional recovery in adult patients with TBI mainly if the intervention started at INCU.
No. 24 Evaluating the Use of the Direct Lamination Method of Socket Casting on Transtibial Amputees in a Rural Community in South Africa, Liezel Wegner; Anthea Rhoda.

Objective: To test the suitability of the direct lamination method of socket casting for transtibial amputees in a rural community in South Africa. Design: Quasi-experimental longitudinal mixed methods study. Setting: Rural community in the KwaZulu Natal province of South Africa. Participants: 17 transtibial amputees and first time prosthetic users. Interventions: Participants were fitted with a transtibial prosthesis making use of the direct lamination method of socket casting. Main Outcome Measures Used: Orthotic and prosthetic users survey (OPUS), 6 min walk test and a focus group discussion. Results: Patients using the direct lamination method of socket casting were at least as functional as the patients with the traditional method of plaster casting. Patients were generally satisfied with the functionality of the prosthesis and indicated an improved quality of life but would like to improve the cosmetics of the prosthesis. Conclusion: At 6 months follow-up the patients using the direct lamination method of socket casting prosthesis reported a much improved quality of life and level of function.

No. 25 AROC – The Australasian Rehabilitation Outcomes Centre – the Impact of Twelve Years of Longitudinal Data Collection and Outcome Benchmarking, Frances Simmonds; Tara Stevermuer.

Objective: The establishment of an Australian medical rehabilitation clinical quality registry which collects a prescribed dataset from participating facilities describing each of their rehabilitation episodes and then provides casemix adjusted benchmarking information to each member facility to allow reflection on process and outcomes and ultimately drive better outcomes for patients. Design: Clinical quality registry. Setting: Australian inpatient rehabilitation units. Participants: 196 Australian inpatient rehabilitation units. Interventions: Not applicable. Main Outcome Measures: Functional independence measure (FIM) change (difference between admission FIM and discharge FIM), length of stay, discharge destination. Level of Evidence: Level 2. Results: More than 98% of inpatient rehabilitation units in Australia have taken up membership and collect a defined set of data items describing demographic, clinical, process and outcome details of rehabilitation episodes they provide. AROC provides regular benchmark reports to all members using AN-SNAP to case mix adjust the data. In 2013 of the 114000 episodes submitted to AROC 40.5% described orthopedic conditions, 8.5% stroke, 2.6% brain injury, 0.9% spinal cord injury, and 23.7% reconditioning. Variation in case mix adjusted outcomes whilst improving is still more than 10 fold. Conclusions: In Australia measuring outcomes in rehabilitation is now routine as is casemix adjustment of the data. The data collected by AROC are analyzed and used to identify trends and drive improvements in practice. AROC identifies and investigates variation in processes and clinical outcomes. AROC aims to drive quality improvement in various ways including through the provision of comparative reporting indirectly through the fostering of competition and more directly through evaluating compliance with outcome targets. Whilst AROC is still learning how to use such measures to drive improvements in both efficiency and patient outcomes, Australia has come a long way over the last 12 years.

No. 26 Subacute Inpatient Rehabilitation Across a Range of Impairments: Intensity of Therapy Received and Outcomes, Frances Simmonds; Jacquelin Capell; Milena Snoek.

Objective: There is evidence that increased intensity of therapy may contribute to improved functional outcomes and efficiency of the subacute rehabilitation process. However the benefits of increased therapy are not able to be generalized across all impairment groups. The amount and type of daily inpatient therapy required to maximize outcomes has not been clearly established. We examined whether there was variation across impairments in the amount of therapy received by inpatients and if the intensity of therapy was associated with rehabilitation outcomes including functional change and length of stay. Design: Prospective observational study. Setting: Australian inpatient rehabilitation units. Participants: 26 Australian inpatient rehabilitation units. Interventions: Not applicable. Main Outcome Measures: Functional independence measure (FIM) change (difference between admission FIM and discharge FIM), length of stay, discharge destination. Level of Evidence: Level 2. Results: Data were collected about the amount of therapy time received by all rehabilitation inpatients admitted in a continuous period of 12 weeks. This was matched with the core AROC data collection resulting in a total of 2018 rehabilitation episodes. The most commonly represented impairments were reconditioning (20%), orthopaedic replacements (20%), orthopaedic fractures (16%), and stroke (13%). The intensity of therapy received for inpatient episodes varied across impairment groups. Correlation between motor and cognitive functional improvement and intensity of therapy was found for stroke but not for other impairments. No correlation between intensity of therapy received and length of stay was identified for any impairment. Conclusions: This observational study provides a snapshot of the current status of the intensity of therapy received by inpatients receiving subacute rehabilitation in Australia. One potential explanation for the lack of correlation between intensity of therapy and outcomes across many impairment groups may be that the threshold of intensity required to affect outcomes is substantially greater than observed in this study.

No. 27 Clinical Assessment of Intra Articular Administration With Collagen-Polyvinylpirrolidone in Knee Osteoarthritis, M.C. Alan Martínez Moctezuma; Dra. Sofia Durán Hernández; Manuel Castillejos; Norma E. González Hernández. Alan Martínez Hospital General Tacuba ISSSTE Sofia Durán Hospital General Tacuba ISSSTE Manuel Castillejos Instituto Nacional de Enferme- dades Respiratorias Norma E. Herrera Escuela Superior de Medicina IPN.

Objective: To analyze the effect of intra articular administration with collagen-polyvinylpirrolidone (clg-pvp) in clinical manifestations of knee osteoarthritis in order to determine its ability to improve patient symptoms with grade II knee osteoarthritis. Design: Experimental longitudinal prospective and comparative. Setting: Rehabilitation hospital service. Participants: A total of 44 patients with grade II knee osteoarthritis according to Lawrence and Kellgren classification were included in the study. Interventions: Previous patients consent clg-pvp was applied into knee articulation three doses per knee. Main Outcome Measures: At day one and ninety were realized Western Ontario MacMaster University Index (WOMAC) visual analogue scale (VAS) and muscle force of knee periarticular muscles. Results: Applying clg-pvp in patients was associated with a statistically significant decrease in the initial and final values recorded by VAS and WOMAC questionnaires also muscle strength record showed significant increase between the initial and final parameters after drug application. Conclusions: The clg-pvp is a good therapeutic option to treat grade II gonarthrosis patients. Reduces pain stiffness improves joint function and this clinical improvement contributes indirectly to enhance muscle strength.
No. 28 Evaluation of a Generic Set to Measure Functional Health Based on the International Classification of Functioning Disability and Health in Mainland China: A Prospective Cohort Study.
Jan D. Reinhardt; Xia Zhang; Melissa Selb; Jianan Li.

Objective: We piloted the clinical implementation of a generic set to assess functional health based on the International Classification of Functioning Disability and Health (ICF). We aimed to evaluate 1) the feasibility of using a generic ICF set-based assessment tool (GISAT) in clinical practice 2) its sensitivity to change and 3) its ability to predict length of stay. Design: Prospective cohort study. Setting: Twenty-one hospitals in 11 different regions of mainland China collected data using the GISAT on patients who were inpatients on 20 May or newly admitted between 20 May and 30 June 2013. These patients were followed up until discharged or 9 July if not discharged previously. Participants: 904 patients with different diagnoses requiring physical rehabilitation were included in this study. Interventions: Physical rehabilitation. Main Outcome Measures: The primary outcome measure employed in this study was the GISAT comprising the ICF categories energy and drive functions (b130), emotional functions (b152), sensation of pain (b280), carrying out daily routine (d230), walking (d450), moving around (d455), and remunerative employment (d850) rated with the generic ICF problem qualifier. Secondary outcomes were length of stay and the duration of each assessment in minutes. Level of Evidence: 2.

Results: Over all times points the average documentation time was 6.1 minutes (95% CI 5.9-6.3). Unadjusted GISAT mean scores were 2.13 (95% CI 2.07-2.19) at admission, 1.87 (95% CI 1.79-1.95) at midterm, and 1.68 (95% CI 1.62-1.74) at discharge (p<0.0001; all Bonferroni corrected pairwise comparisons significant at p<0.001). These results were confirmed by the fully adjusted linear mixed effects model. GISAT admission scores (OR=0.80 95% CI 0.72-0.88) were a significant predictor of the probability of having been discharged (p<0.0001). Conclusions: GISAT is a promising tool to assess patient functional health. It seems feasible for the clinical setting sensitive to change and useful for bed capacity planning.

No. 29 A Comprehensive Rehabilitation Service Improves Functioning and Quality of Life in Spinal Cord Injured Earthquake Victims: A Prospective Cohort Study.
Xia Zhang; Chengjie Yan; Jan D. Reinhardt; Jianan Li.

Objective: To evaluate the effectiveness of institutional based rehabilitation and community based rehabilitation program on spinal cord injured earthquake victims from the bio-psycho-social perspective. Method: Twenty-six patients who suffered SCI from the Sichuan earthquake and were rehabilitated in Mianzhu county hospital were enrolled. Three victims were lost to follow up. Data on demographic information bio-psycho-social function were collected at 3 measurement points (2009, 2010 & 2012). The Barthel index and visual analogue scale were applied to assess the activities of daily living and pain severity respectively. The patient health questionnaire-9 (PHQ-9) was used to evaluate the psychological status. The WHO-QOL and Craig Hospital Handicap Assessment Technique (CHART) were used to evaluate the quality of life. Data were analyzed with a longitudinal tobit regression and linear mixed models. Results: Activities of daily living, physical health, physical independence and mobility were significantly improved over time. Pain severity was not significantly reduced over time. Cognitive independence decreased in 2010 but no significant changes occurred in 2012. Psychological health improved significantly while the PHQ-9 decreased significantly. Social relationships, occupation and social function improved significantly but no statistical significance in social integration. Implications: The physical functioning and quality of life in spinal cord injured earthquake victims improved after the institutional based rehabilitation and community based rehabilitation. Chronic pain was highly prevalent in SCI victims and took a leading role affecting the quality of life.

No. 30 The Effect of a Therapeutic Self-Help Group in Main Caregivers of Students of Multiple Attention Center.
Manuel Rodrigo Espartaco Mendizábal Luna; Lucía Magdalena Allen Hermosilo; Héctor Salas López; Isabel Aguilar Ramírez.

Objective: To test hypotheses that the intervention with a therapeutic self-help group (TSG) for main caregivers of students of the Multiple Attention Center (MAC) Especial Guadalupe diminishes their overload and depression indexes. Design: Prospective quasi-experimental non randomized. Setting: Therapeutic self-help group. Participants: 61 subjects invited to the TSG (n=61). Interventions: We applied an initial evaluation with the Zarit overload scale (ZOS) and the Beck depression inventory (BDI) directed towards the main caregivers of the students of the MAC Especial Guadalupe. Then we gave treatment to such individuals with the TSG that consisted of a total of six sessions with duration of one hour and a half each, frequency of twice per month. The sessions consisted of exchange of experiences between the participants, support therapy, psychological education and reinforcement in competencies and cognitive conductual therapy. Posterior to last session we applied a new evaluation with scales mentioned above in order to analyze results and determine the effect on the group in depression and overload indexes. Main Outcome Measures: ZOS, BDI, paired t test. Results: 13 caregivers that integrate the TSG with initial incidence of overload of 61% and initial incidence of depression of 69%. After the intervention with TSG the final incidence of overload were 13% and depression 23% (p=0.003 and p=0.000). Conclusions: The TSG improves the incidence of overload and depression in main caregivers of students of MAC. Level Evidence: II.

No. 31 Comparison of 4 Different Smoothness Metrics for the Quantitative Assessment of Movement’s Quality in the Upper Limb of Subjects with Cerebral Palsy.
Y. Quijano González; J.E. Chong Quero; D. Villanueva Ayala; J.C. Pérez Moreno.

Objective: To compare the results obtained by computing 4 different quantitative metrics for the assessment of the upper limb during an object-to-mouth task using the elbow angle as the input datum in order to develop a preliminary motor impairment assessment for subjects with cerebral palsy (CP). Design: Case-control study. Setting: Motion Analysis Laboratory CRIT Estado de México. Participants: 19 subjects divided in 2 groups. 9 healthy individuals (7 female 2 male ages between 3 and 15 years) formed the control group. The test group consisted of 10 subjects with CP (3 female 7 male ages between 3 and 14 years). From this group 2 subjects were diagnosed with double hemiparesis 4 with right-sided hemiparesis and 4 with left-sided hemiparesis. Interventions: Not applicable. Main Outcome Measures: The logarithmic dimensionless jerk metric (LDJM) mean arrest period ratio (MAPR) peaks metric (PM) and spectral arc-length metric (SALM) were used for smoothness quantification. The functional independence measure for children (feeFIM) scale was applied for the test group subjects. Evidence Level: Level I. Results: LDJM, SALM,
The aim of this study is to demonstrate if in people affected and un-affected sides. Test group is under the average weeFIM scale values except for the cognitive category. Conclusions: Smoothness metrics are powerful quantitative tools in the assessment of the upper limb movements quality being SALM the most convenient due to its consistency. CP subjects have a delay in the acquisition of psychomotor skills as shown with SALM, LDJM, and PM and clinically indicated with the weeFIM values.

No. 32 Role of a Host Rehabilitation Society in a Large Scale Natural Disaster - The PARM Experience in Typhoon Haiyan - A Project Report.

Dr. Filipinas G. Ganchoon; Dr. Romil M. Martinez; Dr. Rochelle Dy; Dr. James Earl Gosney Jr.


Program Description: PARM cares the disaster rehabilitation committee of the Philippine Academy of Rehabilitation Medicine (PARM) has coordinated multiple basic needs and medical aid missions to aid typhoon Haiyan survivors. Results: 1. 23 typhoon missions were conducted from November 2013 - February 2014. 2. Aid items including food, hygiene/clothing, construction materials/home appliances and first aid kits were distributed to 31000+ beneficiaries. 3. 5450+ beneficiaries received medical care. 4. Persons with disabilities in the community were identified with a basic needs/medical conditions survey and treated. Discussion: PARM Cares conducted multiple basic needs and medical aid missions involving a range of volunteer organizations and providers to meet unmet needs of typhoon Haiyan survivors. A range of aid items were distributed. Medical care was initially provided for wounds from flood debris, uncomplicated primary care conditions, and post-traumatic stress symptoms. A higher prevalence of more severe conditions including complicated infections and exacerbations of chronic disease was seen on later missions due to prolonged lack of medical care and persistent poor living conditions. Physiatric diagnoses evaluated later in the medical response primarily included musculoskeletal complaints related to relocation clean-up and rebuilding efforts. Physiatric team members also evaluated and treated persons with disabilities at the community sites.

Conclusion: The PARM experience in typhoon Haiyan demonstrates that a national rehabilitation society and its PMR members can play a valuable role by conducting humanitarian aid missions in a large-scale natural disaster.

No. 33 Polymorphisms in ESR1 and OPG Genes as Markers of Genetic Risk for Presenting Osteoporotic Fractures in Postmenopausal Women.

Nayeli Cañada, Patricia Canto Celina, David Rojano Mejía, Ramón Coral Vázquez.

Objective: Analyze whether polymorphisms rs2073618 (K3N) OPG and rs3020314 (c.1096 + 5029 c > t) in ESR1 are associated with an increased risk of fracture (s) fragility in postmenopausal women of Mestizo-Mexican ethnicity. Participants: We included postmenopausal women (women with missed periods over 12 months) without osteoporosis (controls 1), with osteoporosis (controls 2) without fracture, and postmenopausal women with fragility fractures (cases) all of Mestizo ethnicity - Mexican (given by at least three generations of the family in this country and who are not biologically related to each other). In both cases the sample size calculation with the power and sample size calculations version 3.0.5 program was conducted. With a final distribution: cases: 191 controls 1: 110 and controls 2: 191. Methods: This is an analytical observational case-control study. Main Outcome Measures: Descriptive Statistics: For quantitative variables mean and standard deviation were obtained for categorical variables absolute and relative frequencies were obtained. Bivariate Analysis: Analysis of association between the presence of polymorphisms and osteoporotic fractures with chi-square test and calculation of risk by odds ratios. A statistical model of logistic regression was used to identify predictors of osteoporosis and fragility fracture adjusted for potential confounding factors. Results: When adjusting for confounding variables model and run the best model of the OPG rs2073618 polymorphism was observed that gene is also associated with the presence of fractures as polymorphism rs3020314 of ESR1 gene significantly (p < 0.004). Conclusions: The present at least one polymorphism (rs2073618 of the OPG gene or rs3020314 of ESR1 gene polymorphism) is associated with the presence of osteoporotic fractures which can be considered as a possible genetic marker in postmenopausal women of Mestizo- Mexican origin. Level 1 (likely reliable) evidence - representing research results that address clinical outcomes and support of other scientific literature.

No. 34 Correlation Between Cognitive Disorders and Dysphagia in Elderly Patients after Postsurgical Orthopedic Rehabilitation Setting.

Alberto Giattini; Silvia Cocci Grifoni; Marco Capriotti; Annarita Caiazzo.

Objective: The aim of this study is to demonstrate if in people with cognitive impairment admitted in a rehabilitation division a correlation with swallowing disorders is present. Design: Case series. Setting: Post-surgical orthopedic elderly patients in admitted in a rehabilitation division. Participants: 36 patients with postsurgical orthopedic diagnosis were assessed. They did not have cerebrovascular, neoplastic, demyelinating or extrapyramidal diseases excluded by neurological examination and a TC scan of the brain. Intervention: The Dysphagia Outcome And Severity Scale (DOSS) and Mini Mental Status Examination (MMSE) were used for screening with more in depth tests aimed to examine attention memory learning and speech abilities. Main Outcome Measures: To assess swallowing abilities the McGill Ingestive Skills Assessment (MISA) scale was used as well as a fiberoptic endoscopic examination of swallowing (FEES). A small group of patients with normal scores was used to compare data with impaired patients. Level 2 (mid-level) evidence. Results: Significant correlations were found between attentive abilities and positioning (r= 0.706 p < 0.001). The praxic abilities showed a mild significant correlation with solid ingestion (r= 0.565 p < 0.015). We didn’t find a significant correlation between apraxic abilities and liquid/solid ingestion/management. We didn’t find a strong correlation between memory and ingestion abilities. In control group we didn’t find any correlation. Conclusions: The correlation obtained as well as the failed correlations give important information about the link between attentive abilities and deglutition aspects of MISA. One study demonstrated a good correlation between swallowing disorders and cognitive disorders in fronto-temporal dementia. In clinical practice this correlation is one of the most serious problems for people who work in rehabilitation to manage.
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No. 36 Role of Epidural Steroid Injection and Gravity Lumber Reduction Therapy in Conservative Treatment of Prolapsed Lumbar Inter-vertebral Disc.
Kunjabi Wangjam.

Disclosure: None. Objective: To study the effectiveness of interlaminar epidural steroid (IL-E1S) and gravity lumber reduction therapy program (GLRT) in treatment of prolapsed lumbar inter-vertebral disc (PVID). Design: Prospective observational study. Setting: PMR clinic in RIMS and JNIMS; from July 2011 to June 2013. Participants: 178 patients, male: female 93: 85, of mean age 43.27 ± 11.6 years, suffering from PVID based on clinical diagnosis for mean duration of 7.3 ± 3.8 weeks. Intervention: IL-E1S using methylprednisolone was given 3 times in 2 weeks time. For those who failed to improve GLRT was given 3 times daily, each session for half hour at tolerated degree for 3 months. Main Outcome Measures: Pain byVAS, restriction of spine flexion by distance of tip of finger from floor in inches, SLRT in degrees, claudication distance in meters and functional - Oswestry Disability Index (ODI). Results: Improvement as indicated by reduction of mean VAS pain from 6.48 to 3.15; flexion from 11.0° to 3.1°; ODI score from 11.09 to 3.08 and increase of mean SLRT from 61.48 to 80.54 degrees; claudication distance from 89 to 237 meters during 3 weeks for ESI 3 months for GLRT groups respectively were statistically significant (p<.001). Out of 178 subjects 125 (70.2%) improved with ESI only and 7 (3.3%) did not improve with both. Conclusion: Conservative management of PVID should include epidural steroid injection and GLRT program, and should be tried for 6 months at least.

No. 38 An Epidemiological Study on the Prevalence Rate of Scoliosis from Local Area.
Zhou Xuan; Du Qing; Negrin Stefano; Chen Pellelie.

Objective: The objective of the present study was to check if factors like age, male/female ratio, curve magnitude, curve type, and curve side are different in China. Design: Cross-sectional study. Setting: Teaching tertiary general hospital. Participants: 352 classes were randomly sampled from each grade of 40 primary schools (5 grades), 34 junior high schools (4 grades), and 8 senior high schools (2 grades) except grade three sampled from each grade of 40 primary schools (5 grades), 34 junior high schools (4 grades), and 8 senior high schools (2 grades) except grade three. We screened schoolchildren of 352 classes. 105 schools (4 grades), and 8 senior high schools (2 grades) except grade three were assigned to relevant therapeutic groups. Main Outcome Measures: Evidence: Cobb angle curve type and curve side of scoliosis were recorded. Level of Evidence: Level 2. Results: Prevalence rate of scoliosis (defined as a curve of 10 degrees or more) was 2.52% (172 of 6824 schoolchildren). There was a negative correlation between the prevalence of scoliosis and age. Girls had a significantly higher prevalence than boys (3.11% for girls and 1.90% for boys) and male/female ratio was 1.15. Most of the curves were small (10 to 19 degrees). Thoracic curve was the most common type of curve identified followed by thoracolumbar curves. 60.3% of thoracic curves were to the right; 75.5% of thoracolumbar curves and 64.7% of lumbar curves were to the left. Conclusions: The prevalence of scoliosis on Chongming Island was 2.52% and was associated with age and gender. Curve type was associated with age but not with gender. Curve magnitude and curve side was not associated with age or gender.

No. 39 McKenzie Protocol in Early Period After A Lumbar Disc Excision.
Izabella Nika; Marek Krasuski; Piotr Tederko.

Objective: In our pilot study we compare outcomes of McKenzie protocol (MKP) and a standard physiotherapy (SP - core strengthening physical modalities and hydrotherapy) in patients early after a disc excision (DE) performed for a lower lumbar paresis resulting from a lumbar disc herniation. Design: A prospective open label controlled study. Material and Methods: 48 patients after DE performed with the same technique by a single surgical team were enrolled to either MKP (n=21; mean age 43/SD=98; 5 females) or SP (n=27; mean age 54/SD=106; 20 females) groups. Between 3rd and 28th day after surgery a common rehabilitation program (neuromobilizations, lumbar extension exercises, education, avoiding of sitting and bending) was introduced in all participants. Between 4th and 8th week study groups were assigned to relevant therapeutic programs. 6 months following surgery we analyzed satisfaction from health, work ability, pain characteristics, muscular strength, sensation, tendon reflexes, trunk alignment, and mobility. Main Results: At the end of follow up period in MKP group we observed higher rate of satisfaction from health (MKP=21-100%; SP=22-81%) lower frequency of sick leave (MKP=2-9%; SP=12-78%) disability pension (MKP=0; SP=4-15%) more frequent return to work (MKP=20-95%; SP=23-85%) fewer pain relapses (MKP=8-38%; SP=27-100%) lower overall pain intensity in VAS scale (MKP=0.5; SP=2.5 p<0.005) fewer pain during professional activities in those who work (MKP=6-30%; SP=18-67%) fewer pain on activities of daily living (MKP=0; SP=9-33%) less cases with a residual lower limb paresis (MKP=2-10%; SP=7-26%; p<0.005) with limited lumbar spine extension (MKP=0; SP=27-100%) and with limited trunk lateral shift (MKP=3-14%; SP=23-85%). Conclusion: MKP is useful in early rehabilitation after lumbar DE.

No. 40 The Effect of Paraspinal Muscle Denervation on Balance of Patients with Lumbar Spinal Canal Stenosis.
Emel Ece Ozcak-Eksi; Ilker Yagci; Hatice Erkal; Sibel Demir-Deviren.

Disclosure: None. Objective: To determine the effects of paraspinal muscle denervation on balance in subjects with both symptomatic and asymptomatic lumbar spinal stenosis (LSS). Design: Prospective non-randomized blinded controlled study. Setting: Assessment of balance and paraspinal muscle denervation in subjects with LSS. Participants: 32 female subjects (mean age 57.7±10.29) with symptomatic (n=15) and asymptomatic (n=17) LSS. Main Outcome Measures: All subjects answered modified Oswestry Disability (disability) Roland Morris questionnaire (functionality) and McGill pain index questionnaire (pain). A blinded physician performed mini paraspinous mapping (paraspinal muscle denervation). Berg Balance Scale (BBS) and device-assisted balance (DAB) tests (weight bearing squat, standing on firm and foam, unilateral stance, rhythmic weight shifting, limits of stability, walk across, tandem walk, step and quick turn, sit to stand, step up and over) were completed for balance assessment. Results: The groups were similar in age, height and BMI (p>0.05). The symptomatic group had significantly more paraspinal muscle denervation (p=0.001). Paraspinal muscle denervation had higher correlations with BBS (p=0.001 r=-0.64) than with pain and disability (p=0.001 r=0.629; p=0.002 r=0.525). Of device-assisted balance tests, limit of stability (LOS) had the highest correlations with BBS and paraspinal muscle denervation. Even the asymptomatic group had impaired directional control to backward in the LOS test as the paraspinal muscle denervation increased (p=0.002 r=−0.721). Conclusions: As paraspinal muscle denervation increased balance impairment, pain and disability increased in symptomatic LSS. We recommend including balance exercises in rehabilitation programs for LSS patients with paraspinal muscle denervation. Further studies are required to evaluate the efficacy of balance exercises on balance in patients with LSS. The LOS test among all the DAB tests had the highest correlation.
with paraspinal muscle denervation. Therefore we recommend evaluation of balance by using LOS tests instead of performing all the DAB tests in symptomatic patients with significant paraspinal muscle denervation.

No. 41 Patients With Degenerative Spondylolisthesis Who Choose to Have Surgery Had Significant Instability and More Fatty Infiltration in Erector Spinae. Sibel Demir-Deviren; Emel Ece Ozcan-Eksi; Shane Burch; Sigurd Berven.

Disclosure: None. Objective: To compare the lumbar paraspinal muscles in subjects with degenerative spondylolisthesis (DS) who chose to have surgery with those who did not. Design: Retrospective study on prospectively collected data. Setting: University based spine center. Participants: Seventy subjects with DS (mean age 69.20±11.09 years, female 48 male 22). Main Outcome Measures: We measured atrophy and fatty infiltration in lumbar multifidus and erector spinae muscles on T1-weighted axial MR images. The expected cross-sectional area and functional CSA (FCSA) of the muscles were measured by using free hand technique on OsiriX®. Then the percentage of muscle atrophy was calculated. Fatty infiltration was graded by using Goutalliér and quartile classifications. Facet joint widening was determined as the largest distance between the apparent articular surfaces. Results: The groups were the same in age (p=0.05). The surgery group had significantly less multifidus atrophy at all disc levels and also had significantly less erector spinae atrophy at all disc levels except L5-S1 (p<0.035). The surgery group had higher fatty infiltration scores for the erector spinae at L5-S1 (p<0.002) and significantly more facet joint widening than the non-surgical group (p=0.036). The facet joint widening was seen in 26.31% and 60.71% of non-surgical and non-surgical subjects respectively. Conclusions: The subjects with DS who chose to have surgery had significant instability and more fatty infiltration in erector spinae at L5-S1. We think the surgical group had significantly less atrophy in multifidus and erector spinae muscles as a result of instability which led muscles to work more to stabilize the spondylolisthesis. More studies are needed to identify whether the patients with unstable DS with fatty infiltration in paraspinal muscles are the patients who would benefit the most from the surgical treatments.

No. 42 What Impairs Balance in Ankylosing Spondylitis? Posture or Disease Activity? Emel Ece Ozcan-Eksi; Osman Hakan Gunduz; Esra Giray; Ilker Yagci.

Disclosure: None. Objective: 1) To compare ankylosing spondylitis (AS) patients and healthy subjects in posture and balance. 2) To identify the factors affecting balance. Design: Prospective controlled study. Setting: University based outpatient clinic university based spine center. Participants: Thirty patients with AS (13 women 17 men, mean age 41.7±7.7 years) and 33 healthy subjects (15 women 18 men, mean age 41.3±7 years) as the control group were included. Main Outcome Measures: NeuroCom Balance Master System® (Orlando, USA) assisted balance tests (weight bearing squat, standing on firm and foam bases, walk across, tandem walk, step, and quick turn); posture assessment (TW, MST, chest expansion); pain; VAS; disease activity (Bath Ankylosing Spondylitis Disease Activity Index BASDAI). Results: The groups were similar in age, height, BMI. In AS group mean values were AS disease duration: 8.6±8.4 years, VAS: 5.9±2.1 BASDAI: 4.7±2.6, TW: 17.7±5.6, MST: 18.6±2.8. The AS group had significantly increased TW and decreased MST than the control group had (p=0.001). The AS group had higher sway velocity in standing on firm base, lower speed in walk across and tandem tests (p<0.030). AS patients with decreased MST had higher sway velocity on foam base (p=0.001 r=0.588). AS patients with decreased MST and increased TW had larger step width in tandem walk (p=0.017 r=0.433; p=0.014 r=0.443). As disease duration prolonged MST decreased and step width increased in AS (p=0.021 r=-0.420 p=0.0420 r=0.433). VAS and BASDAI had no correlation with posture and balance. Conclusions: In AS patients restricted spine flexibility impaired dynamic and static balance; prolonged disease duration impaired only the dynamic balance. We suggest assessment of posture and spine flexibility should be inevitable part of AS follow-up to prevent balance disorders.

No. 43 The Comparison of Paraspinal Muscles in Subjects With Symptomatic and Asymptomatic Lumbar Spinal Canal Stenosis. Emel Ece Ozcan-Eksi; Ilker Yagci; Brian Feeley; Sibel Demir-Deviren.

Disclosure: None. Objective: To compare atrophy and fatty infiltration of lumbar paraspinal muscles in symptomatic and asymptomatic subjects with lumbar spinal stenosis (LSS). Design: Prospective blinded controlled study. Setting: University-based spine center. Participants: Eleven female subjects with symptomatic LSS (mean age 57.0±11.40 years) and nine female subjects with asymptomatic LSS (mean age 56.4±10.53 years). Interventions: After institutional review board approval consecutive patients who were seen in the clinic for LSS were enrolled. Main Outcome Measures: We measured atrophy and fatty infiltration in lumbar multifidus erector spinae and psoas muscles on T1-weighted axial MR images. The expected cross-sectional area and functional CSA (FCSA) of the muscles were measured by using free hand technique on OsiriX®. Then the percentage of muscle atrophy was calculated. Fatty infiltration was graded by using Goutallier and quartile classifications. Level of Evidence: II Results: The groups were similar in age, height, weight, body mass index (p>0.05). The symptomatic group had higher Goutallier and quartile scores for the erector spinae at L5-S1 level (p<0.05). The symptomatic group had smaller multifidus total CSA and at L2-3 L3-4 and L4-5 L3-L4 (p<0.05) than the asymptomatic group. The symptomatic group had more atrophy in the multifidus at L5-S1 disc level as the age advanced (p=0.042 r=0.619). Conclusions: The fatty infiltration particularly in the erector spinae at L5-S1 is more significant than the atrophy in subjects with symptomatic LSS. The symptomatic group had smaller multifidus FCSA even though there wasn’t any significant difference in the percentage of the multifidus atrophy. Further studies need to be done to determine the effect of the fatty infiltration and atrophy of paraspinal muscles on the clinical outcomes in patients with LSS and also on the prognosis of LSS.

No. 44 Managing of Whiplash Injuries Acute in the Primary Care Level: Uncontrolled Trial of Efficacy. Flores Flores Paula, MD; Munguia Cardenas B. Guadalupe Fp; Camelo Carrasco Rocío Fp.

Objective: Compare the efficacy of managing of whiplash injuries acute in the primary care level. Design: Uncontrolled trial study. Setting: Family medicine unit. Participants: 376 subjects assigned to I group treatment with diclofenac acetaminophen physiotherapy (n=160) and to II group Naprosyn acetaminophen physiotherapy (n=216). Interventions: We performed interview, anthropometric evaluation, clinical Quebec classification examination level of depression with the Zung scale, cervical spine x-ray. Main Outcome Measures: Visual Analog Scale (VAS), ROM percentage of subjects depressive days of disability, body-mass index. Level of Evidence: II Results: Affected more women than men in a ratio 3 to 1. The average age was 36.6±17.9 years; they were homemakers 30%, students 26%, employees 21.2%, with overweight 178 (47.3%), obesity 30%, the time elapsed from the suffering accident 25 hrs +20.4 range 1-72 hrs, pain at the beginning 6.9 after six weeks of treatments was 0.52. Without depression 95%, mild depression 4%, and moderate 1%. Injury degree I 32%, degree II 68%, and 0.2% degree III. Group I obtained pain relief at 94.9%, maintain normal motion 97.4%, diminished mobility at 2.5%, returning to work or usual activity before of 30 days 98.7%, and the group II pain relief in 98%, mobility 94.4%, diminished mobility in 5.7%, returning to work or usual activity 93.9%. Disability days 18.9 +11 to employees. With return to work at 13.9 ± 7.7 days p < 0.005 Conclusions: The treatment of whiplash injuries acute in the primary
No. 45 The Effect of Paraspinal Muscles on the Improvement of Patients With Degenerative Spondylolisthesis After Surgery. Emel Ece Ozcan-Eksi; Sigurd Berven; Jeffrey Lutz; Sibel Demir-Deviren.

Disclosure: None. Objective: To determine the effect of paraspinal muscles on the improvement of subjects with degenerative spondylolisthesis (DS) after surgery. Design: Retrospective study on prospectively collected data. Setting: UCSF Spine Center. Participants: Thirty seven subjects with DS who underwent posterior fusion (female: 25 male: 12, mean age: 66.7±9.64 years). Main Outcome Measures: We measured the expected cross-sectional area, functional CSA (FCSA) and fatty infiltration (Goutallier and quartile classifications) in lumbar multifidis and erector spinae muscles at above and below the level of DS on MRI. Then the percentage of muscle atrophy was calculated. Facet joint widening was determined on MRI. We measured Visual Analog Scales (VAS) and Oswestry Disability Index (ODI) at baseline 6 weeks and 3, 6, 12 and 24 months. Level of Evidence: II Results: The subjects with greater multifidis scores at and above the level of DS had more improvement in ODI and VAS at 12 months (r=0.653; r=0.522). The subjects with higher Goutallier scores for the multifidis above and below the level of DS had more improvement in VAS at 24 months (r=0.737; r=0.677). The subjects with higher Goutallier scores for the erector spine at and above the level of DS had more improvement in ODI at 24 months (r=0.993; r=0.993). We found that baseline facet joint widening had no significant effect on the clinical outcomes after the surgery. Conclusion: Subjects with greater multifidis CSA had more improvement in pain and disability in a year after the surgery. Based on our previous study these are the patients with instability. Subjects with more fatty infiltration in the multifidis and erector spinae had more improvement in pain and disability within 2 years after surgery.

No. 46 Improvement in Pain, Function and Quality of Life in Subacute Low Back Pain a Controlled Clinical Trial of Exercise vs. NSAIDS. Jesus Alberto Plata Contreras; Luz Elena Lugo Agudelo; Fabio Alonso Salinas Duran; Kelly De S. Payares.

Study Design: A single-blind randomized controlled clinical trial. Objective: To assess the effectiveness of an exercise program compared with nonsteroidal anti-inflammatory drugs (NSAIDS) for improving pain, disability and quality of life in SLBP patients. Background: Low back pain (LBP) is the most common cause of disability in the world. Levels of pain and disability vary from acute with no improvement to chronic causing disability and work disability. Exercise has been shown to be a cost-effective treatment option for LBP. Methods: Ninety SLBP patients were recruited: 46 performed an exercise program and 44 received NSAIDS (Celecoxib 200 mg/d or naproxen 500 mg/d). The primary outcome was pain improvement of ≥25 mm on the visual analog scale (VAS 0-100 mm) after 4 weeks of treatment. Secondary outcomes were improvement in function (Oswestry Disability Index questionnaire) and quality of life (SF-36), work absenteeism, depression (Patient Health Questionnaire [PHQ-9]) and the number of medical consultations. Results: Pain did not differ between groups at 1 month (average difference: 8.16; 95% CI -2.19 to 18.51) but improved from 47.3 (SD: 19.8) to 28.8 (SD: 20.5) (exercise group p<0.001) and from 45.2 (SD: 22.6) to 34.9 (SD: 25.0) (NSAIDS group p=0.018). Disability (ODI) was lower in the exercise group (mean difference: 4.17; 95% CI 0.22 to 8.12). Disability (RM) was not significantly different (p=0.817). For quality of life (SF-36), only physical function was different and favored exercise (p=0.038). Improvements in pain levels function and quality of life were maintained at 3 and 6 months. Depression (PHQ-9) decreased from 5.7 to 3.9 (exercise group) and from 5.2 to 3.4 (NSAIDS group) (p=0.001). Pain recurred more in the NSAIDS group than in the exercise group: 25.5% vs. 7.1% (p=0.04) and 20.5% vs. 5% (p=0.04) at 3 and 6 months, respectively. Conclusion: Exercise was more effective than NSAIDS for treating SLBP.

No. 47 Transcranial Magnetic Stimulation in the Evaluation of Robotic Rehabilitation Efficacy. V.B. Voitenkov; M.V. Ivanova; N.F. Pulman; N.V. Skripchenko.

Objective: Our goal was to evaluate robotic rehabilitation therapy efficacy with transcranial magnetic stimulation (TMS). Design: 20 children (age 12-16) with neurologic deficits (9 with viral encephalitis sequelae and 11 with cerebral palsy) were enrolled. Interventions: 15 children underwent 10 rehabilitation sessions on robotic rehabilitation device “motionmaker”; controls underwent exercise therapy and massage. All were twice evaluated by TMS (single pulse protocol): 1 day before and 1 day after the therapy. Latency threshold duration and shape of motor evoked potential (MEP) and time of central motor conduction (TCMP) were evaluated. Results: In both groups threshold of MEP dropped at the second evaluation: in robotic therapy group mean drop was on 42% and in controls on 15% lesser than on the 1 evaluation (p=0.05). Latencies of MEP shortened in controls on 1.2 ms and in robotic therapy on 2.1 ms (p>0.05). Duration of MEPs in both groups expanded on 12%. Conclusions: Both treatment regimes raised functional activity of motor cortex (i.e. activated neuromasticility); in robotic therapy group this effect was significant. There was a trend towards more pronounced conductivity improvement in robotic therapy group. Thus robotic therapy proved to be more effective in treatment of children with neurologic disorders after viral encephalitis and cerebral palsy.

No. 48 Osteoporosis in Spinal Cord Injury Patients: Prevalence and Analysis of Associated Factors. Lilian Braitgh; Marta Imamura; Chenneyfer Dobbins; Linamara Rizzo Battistella.

Objective: To evaluate bone mineral density (BMD) by double energy X-ray absorptiometry (DXA) of different skeletal segments in spinal cord injury patients (SCI), comparing with matched controls. Design: Cross-sectional observational. Setting: 77 individuals were recruited. Inclusion Criteria: Male paraplegic patients (SCI level below T1), with traumatic SCI for more than six months, aged 18-50 years, and healthy subjects matched for age and gender. Exclusion Criteria: Use of drugs that interfere directly on bone metabolism, known diseases that affect the bones, presence of heterotopic ossification in both hips, presence of severe spasticity that interferes with positioning for bone densitometry, professional athletes. A brief questionnaire was conducted on lifestyle habits, medical evaluation, bone metabolic profile, BMD measured by DXA for total body bone densitometry, forearm, proximal femur, lumbar and measurement of body composition. 77 participants were included, 43 male paraplegics with traumatic spinal cord injury over 6 months, ASIA A or B, and 34 controls matched for age and gender. Level of Evidence: 3 Results: Paraplegics have low levels of vitamin D, sun exposure and testosterone levels significantly lower than controls. No other secondary cause of osteoporosis has been found. BMD of the paraplegic is lower compared to the control group for hips, legs, pelvis and whole body. Other covariates such as smoking, testosterone levels, lean body mass and physical activity were not associated with BMD. Conclusions: The occurrence of low BMD in paraplegics is very common. Low levels of vitamin D must be an important associated factor. The measurement of BMD in hips, legs, pelvis and whole body are sensitive to diagnosis of low BMD. The whole body DXA gives more information about BMD in paraplegics than usual axial DXA and it can be more useful to prevent risk of fractures in this population.
PEdiATRIC REHABilITATION

No. 49 Correlation of Obesity and Orthopedic Alterations in Children of a Rural Community.
Nayar Alejandro Durán Hernández; Sofía Durán Hernández; Manuel Castillejos López.

Objective: Knowing the prevalence of obesity and orthopedic comorbidities associated. Design: Cross sectional descriptive study. Setting: Public elementary school in El Remolino Zacatecas, México. Participants: Students of a rural elementary school who were between 6 and 11 years old. Interventions: Not applicable. Main Outcome Measures: Sex, gender, height, weight, body mass index (BMI) adjusted with latest parameters of the International Obesity Task Force (IOTF), postural alterations in foot, knees, and spine. We applied the Mann-Whitney U test in order to relation normal weight, overweight and obesity with flat foot, knee alterations (genu varum and genu valgum) and spine curvature disorders (lordosis and kyphosis). Level of Evidence: 1. Results: Of the total child populations studied (76) we found 42 children with normal weight (55.3%), 18 overweight (23.7%), 8 obese (10.5%), and 8 with morbid obesity (10.5%). Spine curvature alterations: a significant correlation (p=0.001) was found between elevated (above 25kg/m²) BMI and the presence of kyphosis or lordosis. In knees we found a very significant correlation (p=0.001) between children with BMI above 27 kg/m² and the presence of one knee orthopedic alteration. Finally we did not find such a significant relation between the presence of overweight or obesity and flat foot (p=0.038) thus the majority of children with it were obese (7 out of 13). Conclusions: Childhood overweight and obesity have a global prevalence of 10% and 3% respectively; México is first place worldwide with a combined prevalence of overweight and obesity of 26% in children population. There is a wide spectrum of orthopedic alterations aggravated by obesity. In this research data we correlated a narrow relation between obesity and knee and spine curvature alterations. It is necessary to conduct new clinical investigations to understand the severity of this association in order to establish early diagnostic and treatment guidelines.

PROSTHETICS ORTHOTICS AND ASSISTIVE DEVICES

No. 51 A Prognostic Clinical Prediction Rule to Identify Adults With Lower Limb Loss Not Likely to Achieve Successful Prosthetic Function Within One Year.
Christopher Kevin Wong; Christine C. Chen.

Objective: Successful prosthetic function depends on balance ability. This study used clinical and self-report data to develop a prognostic clinical prediction rule (CPR) to determine prosthetic functional use. Design: Prospective longitudinal cohort study. Setting: Amputee support group and prosthetic clinic. Participants: Community-dwelling adults with lower limb amputations. Interventions: Not applicable. Main Outcome Measures: Subjects self-reported medical history and activities-specific balance confidence and prosthetic functional use (Houghton scale). Trained physiotherapists used the Berg Balance Scale (BBS) to assess balance ability. The BBS has demonstrated excellent reliability and validity in a heterogeneous sample that included people with bilateral amputations and without prostheses. Prosthetic functional use after 1-year was obtained by phone. A Houghton score ≤9 was considered to be unsuccessful prosthetic use as suggested in the literature. Multivariate logistic regression (including variables?) with bootstrapping was performed. Receiver-operating-curves with area-under-the-curve and probability statistics with cut-points were used in the development of the CPR. Level of Evidence: Level 1. Results: Follow-up data were obtained for 67% of the 54 subjects at entry. The 36 participants reached after 1-year averaged 58.2 years. 94% had unilateral, 71% vascular and 65% transfemoral amputations. Participants averaged 5.7 years post-amputation. 90% were prosthetic-users at entry. The CPR predicted unsuccessful prosthetic functional use with excellent accuracy (auc > 0.8) using 4 criteria: initial Houghton and performance on 3 balance tasks (standing-eyes-closed, looking-back-over-shoulder and turning-360-degrees). Failure in 72 criteria predicted post-test probability of unsuccessful prosthetic use 1-year later in 790% of participants. Conclusions: Clinical screening using self-reported prosthetic functional use and clinical testing of select balance abilities provided accurate 1-year prognoses for unsuccessful prosthetic functional use in a heterogeneous sample of community-dwelling people with lower limb amputations similar to those reported in past research. Use of this CPR may help identify people who may need intervention to use their prostheses successfully.

REHABILITATION OF PATIENTS WITH SPINAL CORD INJURY

No. 53 Ability Realization After Spinal Cord Injury in Six Countries.
Amiram Catz, MD, PhD; Tal Gailli, MSc; Elena Aidinoff; Yoav Benjamini, PhD.

Disclosure: None. Objective: To compare ability realization before and after spinal cord injury (SCI) rehabilitation between countries. Design: Values of the Third International Version of the Spinal Cord Ability Realization Measurement Index (SCI-ARMI) at admission to rehabilitation and at discharge were calculated. The statistical significance of SCI-ARMI gain values (difference between discharge and admission values) was assessed using a t-test. A standardized value of SCI-ARMI gain in different countries was compared using one-way analysis of variance followed by the Tukey test for repeated comparisons. Setting: SCI rehabilitation units in 6 countries: Spain, Italy, Israel, United Kingdom, Portugal, and the United States. Participants: Six hundred sixty one SCI patients. Intervention: Rehabilitation of patients with spinal cord injury. Main Outcome Measures: SCI-ARMI Level of Evidence: Level 1. Results: SCI-ARMI values were 32-43 before and 70-80 after rehabilitation. Values in the various countries were variable at admission but quite similar at discharge from rehabilitation. SCI-ARMI gain was 25-46 and the improvement in ability realization during rehabilitation was found significant (p<0.0001). The standardized SCI-ARMI gain values were found significantly lower in the U.S. than in Israel and Italy (p<0.01) but no significant differences were found in the other comparisons. Conclusions: The similarity between most countries in SCI-ARMI after rehabilitation despite the initial variability may indicate that caregivers are aiming at similar ability realization in all the participating countries. The smaller improvement in ability realization in the U.S. may be related to the shorter length of stay in rehabilitation and to aim to reduce the burden of care (improving the FIM score) rather than to maximize ability realization.

No. 55 Treatment of Detrusor External Sphincter Dyssynergia Using Ultrasound-Guided Catheter Trocar Botulinum Toxin A Injection in Male Patients with Spinal Cord Injury
Wei Xin Yang; Hong Jun Zhu; Da Wei Zhang; Wei Guo Chen.

Disclosure: None. Objective: To evaluate the effects of transrectal ultrasound-guided catheter trocar botulinum toxin A injection into external urethral sphincter for treating detrusor external sphincter dyssynergia in male patients with spinal cord injury. Design: Pilot study with assessments before and after BTX-A external urethral sphincter injection. Setting: Hospital rehabilitation department. Participants: Patients (n=15; age 40.5; range 22–64y) with suprasacral spinal cord injury with confirmed detrusor external sphincter dyssynergia on urodynamics study. Interventions: A single dose of 100U BTX-A was injected into the external urethral
sphincter via transrectal ultrasound-guided catheter trocar urethra injection. Main Outcome Measures: Maximal detrusor pressure, detrusor leak-point pressure, maximal pressure on static urethral pressure profilometry, and postvoiding residuals. Results: After BTX-A urethral injection 4 patients (28.5%) had an excellent result, 7 patients (46.7%) had an improved result, and 4 patients (28.5%) had treatment failure. The overall success rate was 75.2%. We show significant reductions in static urethral pressure (p<0.05) and detrusor leak-point pressure after treatment (p<0.05) but not in detrusor pressure. Postvoiding residuals were significantly decreased in the fourth week after treatment (p<0.05).

Conclusions: Transrectal ultrasound-guided catheter trocar BTX-A injection into external urethral sphincter is effective in suppressing and ameliorating detrusor external sphincter dyssynergia. It is a simple and reliable operating technique.

SPORTS AND MUSCULOSKELETAL REHABILITATION

No. 56 Randomized Trial of the Effects and Optimal Treatment Frequency of Pulsed Electromagnetic Fields on Postmenopausal Osteoporosis.
Huifang Liu; Ying Liu; Chunyan Wang; Hongchen He.

Objective: Postmenopausal osteoporosis (PMO) is a major public health threat worldwide and there are a wide variety of treatment options. Among non-drug treatments pulsed electromagnetic fields (PEMFs) are clinically applied more and more frequently nowadays especially for those intolerant to medications. However research investigating its effects and optimal treatment frequency is limited so we conducted this randomized controlled clinical trial to explore these specific issues. Methods: One hundred twenty participants met the inclusion criteria and were randomly assigned to receive alendronate or one course of PEMF treatment. The primary endpoint was the mean percentage change in bone mineral density of the lumbar spine (BMDL) and secondary endpoints were the mean percentage changes in left proximal femur bone mineral density (BMDF), visual analogue scale score (VAS), the timed up & go test (TUG) and Berg balance scale score (BBS). The BMDL, BMDF, VAS, TUG, and BBS score were recorded at baseline 5, 12, 24, 48 and 72 weeks. Results: No significant difference was found between the two groups on mean percentage changes from baseline of BMD within 24 weeks after randomization (p > 0.05). While at 48 weeks and 72 weeks BMD of the PEMF groups were significantly lower than that of the alendronate group (p < 0.05). With respect to VAS, TUG and BBS score there was no significant difference detected between the two groups (p > 0.05). Conclusions: A course of PEMFs was as effective as cyclical alendronate in treating PMO for at least 24 weeks. Its optimal treatment frequency for PMO may be one course per six months.

Huifang Liu; Hongchen He; Shasha Li; Lin Yang.

Objective: The vitamin D receptor (VDR) gene polymorphisms have been reported to be involved in the development of many musculoskeletal disorders including osteoarthritis (OA). However results were inconsistent and there is no definite conclusion regarding the association between any VDR polymorphism and the risk of OA. In this study we conducted a meta-analysis to determine whether bsmI taqI and apal gene polymorphisms in the VDR gene are associated with OA susceptibility. Methods: Literature search was performed using PubMed and Embase databases. Studies illustrating the association between the three VDR polymorphisms and OA were included and their qualities were assessed using Newcastle-Ottawa Scale. Results: Eight eligible studies recruiting 1626 cases and 2024 controls were identified. Their methodological qualities were generally good with scores ranging from 6 to 8 points. However throughout all summary analyses which were performed for multiple categories and on four contrasts (allele contrast of homozygotes recessive and dominant models) none of the VDR bsmI taqI and apal gene polymorphisms were found to be significantly associated with the risk of OA. Moreover there was no significant publication bias. Conclusions: Results from this meta-analysis suggested that the VDR bsmI taqI and apal gene polymorphisms might not be important predictors of OA. More studies further investigating these associations especially taking into account of gene-gene environment interactions and other confounding factors are warranted.

No. 58 Sarcopenic Obesity Worsens Bone Strength: Hip Strength Analysis in Post-Menopausal Women.
Raffaele Gimigliano; Alessandro De Sire; Giovanni Iolascon; Francesca Gimigliano.

Objective: The aim of this retrospective case-control study is to investigate the influence of sarcopenic obesity on hip bone strength indices: femoral strength index (FSI), cross-sectional moment of inertia (CSMI), cross-sectional area (CSA), section modulus (z), and buckling ratio (BR). Setting: Outpatient Clinic University Hospital. Participants: Participants were recruited among patients who were assessed for osteoporosis using DXA method from January 2011 to December 2013. Inclusion criteria were: post-menopausal women aged 50 years or older; BMI ≥ 30 kg/m². We excluded all the included patients in sarcopenic obese and non sarcopenic obese following Newman's criteria based on appendicular lean mass adjusted for height and body fat mass (residuals). Main Outcome Measures: We performed a hip structural analysis (HSA) from hip DXA images to measure FSI, CSMI, CSA, z, and BR. Results: We evaluated 127 women aged mean 63.30 years ± 8.69 SD (min. 50 years; max. 84 years) with a mean BMI of 34.27 kg/m² ± 4.01 SD (min. 30.04; max. 53.97). Forty-five sarcopenic obese patients (35.43%) had a mean FSI of 1.17 ± 0.33 SD; a mean CSMI of 9613 ± 2403 SD; a mean CSA of 134 mm² ± 23 SD; a mean z of 556 mm³ ± 113 SD and a mean BR of 9.11 ± 4.23 SD. Eighty-two non sarcopenic obese patients (64.57%) had a mean FSI of 1.30 ± 0.30 SD; a mean CSMI of 9886 mm³ ± 1970 SD; and a mean CSA of 135 mm² ± 21 SD, a mean z of 571 mm³ ± 102 SD and a mean BR of 7.11 ± 2.67 SD. Conclusions: In our cohort of post-menopausal women, sarcopenic obese patients had worse bone quality and strength.

No. 59 Effects of Focused Extracorporeal Shock Waves Therapy in Patients with Chronic Plantar Fasciitis.
Raffaele Gimigliano; Alessandro De Sire; Carmen Palladino; Pietro Gravina.

Objective: The aim of our study is to evaluate the effects of extracorporeal shock waves therapy (FESWT) in reducing pain and improving functioning in patients with chronic plantar fasciitis. Setting: Outpatients Clinic University Hospital. Participants: We recruited patients with chronic plantar fasciitis who were previously treated with drug therapy without achieving significant results in terms of improvement in pain symptoms from January 2012 through February 2014. The energy (0.13-0.33 mJ/mm²) was applied in four sessions once a week. Main Outcome Measures: We evaluated pain using the visual analogue scale (VAS) before each session of ESWT (t0-t1-t2-t3) and 1 month after the last session (t4). Before the first session (t0) and 1 month after the last session (t4) we performed also the brief pain inventory (BPI) aggregated into two dimensions: pain severity index and dysfunction index. Results: We evaluated 78 patients (44 men and 34 women) mean aged 59.12 years (min. 33; max. 95) with a mean BMI of 26.69 ± 3.48 kg/m². The mean values of VAS were 7.14 ± 1.22 SD at t0; 5.53 ± 1.20 SD at t1; 4.00 ± 1.26 SD at t2; 2.47 ± 1.68 SD at t3 and 1.67 ± 0.42 SD at t4 (p < 0.000). The mean values of BPI pain severity index were 7.09 ± 1.13 SD at t0 and 1.63 ± 1.32 SD at t4 (p < 0.000). The mean values of BPI functional interference index were 6.30 ± 1.10 SD at t0 and 1.03 ± 1.01 SD at t4 (p < 0.000). Conclusions: In our study we demonstrated that focused ESWT is a safe and effective
treatment for plantar fasciitis with a reduction of pain and improvement of the functioning.

**No. 61 Botulinum Toxin Type A Clinical Effect in Gonarthrosis Grade II Patients.**

Sofia Duran Hdez, MD; Norma G. Herrera, PhD; Citaltepetel L. Salinas, PhD; Manuel Castillejos, PhD.

**Introduction:** Gonarthrosis is a heterogeneous group of conditions leading joint symptoms and signs which are associated with cartilage degradation and changes in the underlying bone margins. Among the factors that accelerate this condition are overweight, muscle weakness and imbalance in loading axes. **Background:** The treatment is based on the control of pain and inflammation and to stop the process of cartilage injury with either drug treatment, rehabilitation or both. Botulinum toxin type A (BoNT-A) has been shown to have a direct effect on the pain regulating substances such as glutamate and substance P and the processes of inflammation in a very specific way. **Materials and Methods:** We admitted 45 patients (38 women 7 men) with a diagnosis of gonarthrosis Grade II enrolled and evaluated in Tacuba General Hospital in Mexico City. The medical history included: age, sex, occupation, body mass index (BMI), visual analogue scale (VAS), muscle strength, and Western Ontario and McMaster Universities Arthritis Index (WOMAC) on days 1, 30, 60 and 90. We apply a single dose of 100U BoNT-A in each knee in the retropatellar bursa.

**Results:** Over 80% of the population suffers from overweight or obesity grade I as the results of assessment of muscle strength was achieved an average increase of more than 10 kg in each leg an average weight reduction of 2.5 kg without significant difference. Not so the WOMAC scales and VAS where reported a significant difference between the initial and final figures study' p<0.0001 by Student’s statistical analysis. **Conclusions:** BoNT-A proved to be an effective treatment for pain control and inflammation in patients with knee osteoarthritis Grade II.

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**No. 62 Baseball Batting Performance After Gravitational Wellness Lifting.**

David T. Burke; Cleo Stafford; Victor Osissanya.

**Objective:** To determine the effect on college baseball batting performance by using the gravitational wellness weight training program.

**Design:** A retrospective review comparing the hitting performance of college baseball players who had participated in extremely high weight lifting program between seasons to those who have not. Weights lifted in weekly 30-minute sessions covering four lifts were recorded. **Participants:** College baseball players: the intervention was a weightlifting program involving a unique program involving high weights lifted in four stations during a 30-minute session repeated weekly. **Outcomes:** The change in batting performance in consecutive seasons was taken from published statistics and compared to a historical cohort of players who did not participate in the off season gravitational wellness weight lifting system. **Level of Evidence:** Level I Results: At the end of 10 weeks of training the average weight lifted using the Belt lift technique was 1840 pounds, ranging from 1480 to 2180 pounds. Those in the weightlifting group realized a 17% improvement in batting average (vs 0% for the historical control), 115% increase in home runs (vs -3% for the historical control), a 30% improvement in runs batted in (vs 0% for the historical control) and 35% improvement in slugging percentage (vs 0% for the historical control). There was no difference between groups in changes in batting averages. **Discussion:** These results indicate that using extremely high weights lifted 30 minutes per week can result in improvements in batting performance including batting averages, slugging percentages, runs batted in, and home runs. **Conclusion:** This study adds to the literature demonstrating that a program of 30 minutes/week of weight lifting with extremely high weights can result in significant weight lifting gains and can also increase sports performance.

**No. 63 Immediate Massage Stimulates Muscle Regeneration Angiogenesis and Decreases Fibrosis After Muscle Injury (Encore Presentation).**

Kunj G. Patel, MD; Makoto Kobayashi, MD; Tom Best, MD, PhD; Johnny Huard, PhD.

**Objectives:** Incomplete muscle healing after injury is a common problem in sports medicine and in general rehabilitation hospitals. One common treatment for muscle injury is massage. However evidence is lacking supporting the mechanism of action and optimal timeline of delivery. **Design:** Four New Zealand rabbits were injured in one leg by an eccentric exercise protocol of 7 sets of 10 repetitions of lengthening contractions of the tibialis anterior (TA) muscle with 2 minutes rest between sets. After injury, rabbits were assigned to receive massages consisting of a 10N force applied at frequency of 0.5Hz for 15 minutes for 4 consecutive days. 24 hours of rest were given between each massage. The rabbits began massage at different time points: immediately after injury, 24 hours after or 48 hours after. One rabbit served as a non-massaged control. 24 hours after the last massage the TA muscles were harvested from both legs, sectioned, stained (H&E Trichrome CD31 Antibody), imaged and analyzed. **Results:** All massaged TAs showed increased percentage of regenerating muscle fibers (3.5% SD = 0.1) compared to the non-massaged injured muscle portion (2.5% SD = 0.5) and the non-injured contralateral leg (0.7% SD = 0.3 p<0.05). All three massaged TAs also showed an increased number of CD31+ blood vessels. The immediately massaged muscle exhibited the greatest increase in CD31+ blood vessels (24% increase) with the 24hr delay and 48hr delay showing stepwise decreases. For fibrosis analysis the immediate massage treatment resulted in a decreased fibrotic area (5.7%) almost achieving baseline levels of fibrosis as observed in the uninjured contralateral leg (5.0%). **Conclusion:** Massage immediately after injury increases muscle regeneration angiogenesis (CD31+ vessels) and decreases fibrosis. These effects demonstrate the first biological explanation for massage.

**No. 65 Effects of Whole Body Vibration Exercise Associated with Quadriceps Resistance Exercise on Functioning and Quality of Life in Patients with Knee Osteoarthritis: A Randomized Controlled Trial.**

Jan D. Reinhardt; Wang Pu; Lin Yang; Chengqi He.

**Objectives:** To determine effects of whole body vibration exercise (WBVE) associated with quadriceps resistance exercises (QRE) versus QRE only on pain, physical function, biomarkers in serum and urine, activities of daily living (ADL), and quality of life in patients with knee osteoarthritis (OA). **Design:** Randomized-controlled trial. **Setting:** Rehabilitation medicine outpatient department Sichuan People’s Republic of China. **Subjects:** Forty-nine patients were assigned to WBVE + QRE and 50 to QRE. **Interventions:** WBVE and QRE provided 5 days per week over a 6-month period. **Main Outcome Measures:** Outcomes included pain assessed with visual analogue scale (VAS), timed up & go test (TUG), 6-min walk distance test (6MWD), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), range of motion, muscular strength, serum comp and urinary CTX-II Lequesne index (LI) and SF-36. All outcomes were analyzed with mixed effects regression. **Level of Evidence:** Level I Results: Compared with baseline WBVE + QRE significantly improved in VAS, TUG, all WOMAC scales, active knee flexion (AKF) and extension (AKE), knee flexor (KFS) and extensor strength (KES), serum comp urinary CTX-II LI and SF-36 at 2 weeks and in 6MWD at 1 month in addition. Compared with QRE, WBVE + QRE showed significantly greater improvement in VAS, AKF and AKE at 2 weeks; in VAS, serum comp urinary CTX-II and SF-36 at 1 month; in all outcomes apart from TUG, WOMAC, stiffness KFS and LI at 4 months; and in all outcomes except KFS at 6 months. **Conclusion:** Over a six-month period WBVE in combination with QRE improved symptoms, physical
function, ADL and quality of life in patients with knee OA to a great extent and was superior to QRE in most outcomes.

No. 66 Comparative Study of Qizheng Xiaotong Patch and Voltaren Gel on Acute Mild Exercise Hamstring Injury Treatment.
Ligong Duan; Hui Chen; Xia Liu.

Objective: To compare the clinical efficacy between qizheng xiaotong patch with voltaren diclofenac diethylamine emul gel on athletes mild acute hamstring injury treatment. Participants: 60 athletes with mild acute hamstring injuries were randomly divided into qizheng xiaotong patch group (QZXT n=30) and voltaren diclofenac diethylamine emulgel group (VDDEN=n=30). Main Outcome Measures: Before and 72h after treatment CK, TNF-a, IL-6 were analyzed as well as hamstring isokinetic test were processed by Isomed system; before treatment(T0), 1h(T1), 24h(T2), 72h(T3) and 7 days(T4) after treatment all subjects received CRP investigate and pain score examination. Results: Both drugs can release the subjective and objective pain. But at T2 the efficiency of treatment in QZXT is better than in VDDE. The CK, TNF-a, IL-6 differences between two groups largely depend on the individual varieties. The qizheng xiaotong patch can improve eccentric strength of hamstring centrifugal muscle. At the same time voltaren gel can improve concentric strength. Conclusions: On the point of pain release improving the eccentric strength qizheng xiaotong patch is better than voltaren diclofenac diethylamine emulgel.

No. 67 The Clinical Pathway Management of Rehabilitation Following Total Knee Replacement.
Du Ju-Bao; Song Wei-Qun.

Objective: To discuss the effects of clinical pathway management during rehabilitation after total knee replacement (TKR). Methods: From 2012 to 2013, 26 patients were accepted in the clinical pathway management of rehabilitation following TKR in our hospital. 3-7 days after TKR all patients were admitted in rehabilitation medicine department with the do's and don'ts of their orthopedists. After evaluation our rehabilitation team gave them comprehensive training which included passive ROM training, muscle strengthening, proprioception exercises, balance exercises, weight-bearing exercises and gait training for 14 days. We tested their improvement with AKSS and the knee joint ROM during admission, discharge and 2 weeks after discharge. The control group included 28 patients before 2012 without clinical pathway management of rehabilitation following TKR but with the same do's and don'ts of their orthopedists. Results: All evaluation indexes had no difference between rehabilitation group and control group during admission and discharge (p>0.05). After 2 weeks of rehabilitation the marks of AKSS and the knee joint ROM in rehabilitation group was better than that in control group (p<0.05); what's more these improvements were kept 2 weeks after discharge (p<0.01). To the contrary some patients in control group had to be hospitalized with poor function. Conclusion: The clinical pathway management of rehabilitation following TKR could enhance the adherence to rehabilitation training which would increase the ROM of knee joint and thus facilitate their function restoration and improve their quality of life.

No. 68 The Efficacy of Extracorporeal Shock Wave Therapy in Calcaneal Spur.
Tarek Shafshak; Enas Shaheine.

Objective: To assess the efficacy of extracorporeal shock wave therapy (ECSWT) on pain relief in patients with heel pain due to calcaneal spur. Design: Case series. Setting: Referral center. Participants: 40 feet belonging to 31 patients with heel pain due to calcaneal spur (vas ef 5).

Exclusion Criteria Included: Hyperuricemia, inflammatory arthropathies polyneuropathy, tenosynovitis around the ankle and tarsal tunnel syndrome. Interventions: 1) rheumatological and neurological examination, 2) x-ray (lateral view) of the feet; 3) ECSWT (1200 shocks/session scheduled as one session/week) was given until the patient experienced complete relief of heel pain or until a total of 6 sessions was given. Main Outcome Measures: Visual analogue scale and verbal rating scale for pain relief. Level of Evidence: Level 2. Results: Patients with heel pain complaint of less than 4 months duration prior to ECSWT (n=21 feet) experienced complete relief of heel pain following 1-3 sessions. Those with heel pain of 6-24 months duration prior to ECSWT (n=19 feet) experienced complete or marked relief of heel pain following 3-6 sessions. Conclusions: ECSWT appeared effective in relieving heel pain among patients with calcaneal spur especially when given within the first 4 months after the start of patient complaint. ECSWT is recommended to be the first choice in treating calcaneal spur.

No. 72 Effect of Self-Assembled Peptide-Platelet Rich Plasma on Rotator Cuff Chronic Tendinopathy.
Song Jun Kim, MD, PhD; Sang Mok Lee, BS; Young Mee Jung, PhD; Soo Hyun Kim, PhD.

Disclosure: None. Objective: To reveal the therapeutic effect of self-assembled peptide (SAP) known as scaffold for drug delivery combined with platelet rich plasma (PRP) on chronic rotator cuff tendinopathy. Design: Experimental study. Setting: Animal laboratory at biomedical research institute. Participants: 27 Sprague-Dawley rats (15 week-old) used for preparing chronic rotator cuff tendinopathy by dissecting their supraspinatus muscles and overuse training. Interventions: The SAP with a sequence of ac-KLDLKDLKDL-NH2 (KLD12) was synthesized to produce a 1% KLD12 peptide gel and the PRP was prepared using peripheral blood from a healthy male volunteer. A week after the surgery the rats were randomly divided into 4 groups: SAP (n=7), PRP (n=7), SAP-PRP (n=7), and control (n=6) groups. 0.2 ml of SAP, PRP, SAP-PRP, and saline were injected into the supraspinatus insertion area, respectively. Main Outcome Measures: Maximal stride length was checked before the injection and repeated at 2 and 4 weeks after the injection. Histological studies (H&E and Masson’s trichrome staining) were conducted for collagen arrangement and vascularity at 6 weeks after the injection. Immunofluorescent staining of heat shock protein (HSP)-70 and caspase-3 known as indicators of apoptosis was performed. Level of Evidence: Level 1. Results: Maximum stride length increased in the SAP and SAP-PRP groups at 2 weeks after the injection. This increment was maintained until 4 weeks after the injection in the SAP-PRP group but not in the PRP group. Collagen arrangement and vascularity were the best in the SAP-PRP group and the worst in the control group. The immunofluorescence images showed that HSP-70 and caspase-3 were much less expressed in the SAP-PRP group than in other groups. Conclusions: Combined injection of PRP and SAP can be effective in treating a chronic rotator cuff tear by enhancing collagen arrangement and inhibiting apoptosis.

No. 73 Determination of Steroid Injection Sites Using Lidocaine Test in Adhesive Capsulitis.
Song Jun Kim, MD, PhD; Jeong Yi Kwon, MD, PhD; Jeong Min Hwang, MD.

Disclosure: None. Objective: To validate the usefulness of subacromial bursa lidocaine injection for determination of therapeutic steroid injection site in patients with adhesive capsulitis. Design: A prospective randomized clinical trial. Setting: Outpatient clinics in tertiary university hospital. Participants: Patients with adhesive capsulitis were recruited from December 2011 to January 2013. Adhesive capsulitis was diagnosed
through the clinical symptom and physical findings with the exclusion of rotator cuff tear and glenohumeral joint arthritis through ultrasound and simple radiologic studies. **Interventions:** 92 patients with adhesive capsulitis were divided into LC (lidocaine test) group (n=46) and GH (glenohumeral) group (n=46). In LC group lidocaine test injection was performed at the subacromial bursa before the therapeutic steroid injection and according to the response of pain reduction steroid injection was performed at the subacromial bursa or glenohumeral joint. In GH group the steroid was injected into the glenohumeral joint without any test injection. Both groups then underwent a supervised physical therapy protocol. **Main Outcome Measures:** Improvement of shoulder pain was checked 2 weeks and 3 months after the injection and expressed on an ordinal scale. Passive range of motion (PROM) of the shoulder was recorded before, 2 weeks after and 3 months after the injection. **Level of Evidence:** Level 1. **Results:** Two weeks after the injection 36 patients (78%) in the GH group and 14 patients (66%) in the LC group reported improved pain which was significantly different (p<.001). This difference was maintained 3 months after the injection (p=.001). PROMs improved significantly 3 months after the injection in both LC and GH groups (p<.001). However there was no significant difference between LC and GH groups. **Conclusions:** We found that subacromial bursa lidocaine injection prior to steroid injection resulted in better improvement of pain than conventional glenohumeral joint injection for patients.

**No. 75 Ischemic Compression Block Attenuates Spontaneous Electromyographic Activity Evoked From Latent Myofascial Trigger Points.**

Yonghui Wang; Fei Meng; Jing Chen; Shouwei Yue.

**Disclosure:** None. **Objective:** To evaluate whether or not large diameter myelinated muscle afferents contribute to the pathophysiology and spontaneous electromyography activity (SEA) of myofascial trigger points (MTRPs). **Design:** A within-subject cohort design. **Setting:** EMG research laboratory. **Participants:** 20 healthy subjects with a latent MTRPs in the brachioradialis muscle on one forearm and no symptom of musculoskeletal pain volunteered for this study. **Interventions:** The ischemic compression block (ICB) of large diameter myelinated muscle afferents was obtained with a 7-cm wide tourniquet applied around the upper arm proximal to the brachioradialis muscle in 20 healthy subjects.

**Main Outcome Measures:** Visual analog scale (VAS) for assessing the local pain and referred pain, the needle electrode recording intramuscular SEA evoked from a trigger point in the brachioradialis muscle in subjects at the time of pre-compression 20 min following compression and 10 min after de-compression. **Level of Evidence:** Level 1. **Results:** The VAS peak values of the local pain and referred pain at MTRPs were significantly decreased after ICB and then raised up after decompression. The VAS peak values of the local pain were significantly higher than that of referred pain. The average amplitude and frequency of the intermittent spike activity of SEA also significantly decreased after ICB compared with pre-compression and increased again after de-compression. **Conclusions:** These results suggest that large diameter myelinated muscle afferents fiber may be involved in SEA and mechanical hyperalgesia at MTRPs.

**No. 77 Effect of Static Stretch Versus Static Stretch and Ultrasound on Hamstring Muscles Extensibility in Healthy Women.**

Mayerly Carolina Anaya Niño; Mayerly Carolina; Anaya Niño; Adriana Angarita Fonseca; German Andres Villamizar Rayon.

**Introduction:** Evidence on the effect of ultrasound (US) + static stretch (SS) on increasing the extensibility of the hamstring muscles is insufficient. **Objective:** To compare the effects of SS versus US+SS on extensibility of the hamstring muscles in adult women. **Design:** Randomized controlled clinical trial. **Setting:** School of Physical Therapy Bucaramanga, Colombia. **Participants:** The study included 14 healthy women age 22.3 ± 3.9 years old, BMI 20.7 ± 2.1 kg/m². **Interventions:** Participants were randomly assigned to two groups: US + SS (n=8) previously was applied with US for 8 minutes at frequency 1 MHz, intensity 1.5 w/cm² and mode continuous and later the stretch was applied for 7 minutes. Group SS (n=6) only got static stretching for 7 minutes. The differences between assessments were compared using t-Student and the effect of the intervention was evaluated by analysis of covariance (ANCOVA). **Main Outcome Measures:** Range of motion of knee extension with 90 degrees of hip flexion as suggested by Norkin and White. **Level of Evidence:** Level 1. **Results:** Increased significantly flexibility of the lower limbs in both groups. In the US+SS group increased -8.75±5.5 while in the SS group the increase was -3.5±2.7 when comparing the groups no statistically significant differences were found. Increase statistically significant in the final grades in the intervention group US+SS -5.8 (95% CI -10.9-0.67 p = 0.030) compared with the SS group by adjusting only for baseline score. **Conclusion:** A single exposure to US+SS is sufficient to enhance the gains in hamstring extensibility in adult women compared to SS only.

**POSTER ABSTRACTS**

**CANCER REHABILITATION**

**No. 2 Spinal Metastasis, Mobile Ability, and Key Person Living Together Are Predictors of Discharge Destination for Cancer Patients.**

Tetsuya Enishi; Masanori Inatsugi; Nori Sato; Shinsuke Katoh.

**Introduction and Aims:** Identifying factors associated with different discharge outcomes of patients with cancer are valuable to practitioners and program managers. This information will enable better case planning and management across the system; patients and their family can also use this information in forming their expectations of their hospitalization and the possible outcomes of their hospital stay. The aim of this research is to examine factors associated with discharge destination after rehabilitation for cancer patients. **Material and Methods:** We examined factors associated with discharge destination after rehabilitation for cancer patients treated by our department in Tokushima University Hospital Japan from September 1, 2010, to September 31, 2011. This study received ethics approval from the Tokushima University Hospital Ethics Board. The authors declare no conflict of interest. **Results:** Univariate analysis demonstrated the significant correlation among FIM motor score at discharge. FIM cognitive score at discharge, mobile ability, walking aids, spinal metastasis, and key person living together. Multinominal logistic regression revealed significant differences in spinal metastasis, mobile ability and key person living together as factors associated with discharge destination. **Conclusion:** These findings show that spinal metastasis, mobile ability, and key person living together are most significant predictors of discharge destination. This study will be a useful resource for those considering which type of facility (i.e. home or nursing facility) is more suitable for patients. Our data will allow staff to create better-tailored rehabilitation programs.

**No. 3 Long-term Evaluation in Rehabilitation After Metastatic Bone Fracture: A Case Report.**

I. S. Strafulat; A. Sirbu, Prof. Dr.; W. Friedl, Prof. Dr.

**Setting:** Rehabilitation Department Clinical CF Hospital, Iasi, Romania. **EU: Patient:** A 48-year-old male with left shoulder metastasis. **Case Description:** A patient presented in the emergency department with proximal humeral fracture after falling on ice with unfavorable outcome after immobilization; further evaluation provided the diagnostic of pathological-bole fracture - hepatic carcinoma metastasis. The patient was operated on in Germany were the tumor was resected (head of humerus and two thirds proximal humerus) and humeral prosthesis was implanted. Histological investigation confirmed metastasis. Post operatory the arm was immobilized in a Gilchrist bandage. Medical treatment included focused chemotherapy, analgesics and anticoagulant; he was discharged after 6 days.
No. 4 Multidisciplinary Rehabilitation in Persons With Primary Brain Tumour: A Controlled Clinical Trial.
Fary Khan, MBBS; Bhasker Amatyia, MD MPH; Mary Galea, PhD Bappsci (Physio) BA Grad Dip Physio Grad Dip Neurosci; Kate Drummond.

Disclosure: None. Objective: To evaluate the effectiveness of multidisciplinary (MD) rehabilitation program for persons with brain tumour (BT) (gliomas) in an Australian community cohort. Design: Controlled clinical trial. Settings: Ambulatory rehabilitation settings. Participants: The BT survivors (n = 106) in the community were allocated either to the treatment group (n=53) or waitlist control group (n=53) irrespective of their tumour grade severity and duration by treating team based on their requirement. Interventions: The treatment group received individualized intensive ambulatory (centre-based) MD rehabilitation while the waitlist patients were the control group who continued with their usual activity in the community. Main Outcome Measures: The primary outcome functional independence measure (FIM) measured 'activity' limitation. Secondary measures included depression anxiety stress scale (DASS), perceived impact problem profile (PIPP), and cancer rehabilitation evaluation system short form (CARES-SF). Assessments were at baseline and 6 months. Results: Participants were predominantly female (56%), with mean age 51±13.6 years (range from 21 to 77 years) and median time since diagnosis of 2.1 years (inter quartile range = 0.9 to 4.0). Intention-to-treat analysis showed a significant difference between groups at 3-month in favour of MD program in FIM motor subscales: ‘self-care’, ‘sphincter’, ‘locomotion’, ‘mobility’ (p<0.01 for all); and FIM ‘communication’ (p<0.01) and ‘psychosocial’ subscales (p<0.05) with small to moderate effect size (r=0.2-0.4). At 6-month follow-up significant improvement in the treatment group was maintained only for FIM ‘sphincter’ communication and ‘cognition’ subscales (p<0.01 for all). No difference between groups was noted in other subscales. Conclusions: BT rehabilitation is challenging due to high mortality rates, often progressive in nature, uncertain prognosis with multifaceted physical and cognitive disabilities and participatory limitations. BT survivors can improve function with MD rehabilitation with some gains maintained up to 6 months. Evidence for specific interventions in the ‘blackbox’ of rehabilitation is needed.

No. 5 Effects of Exercise Interventions on Pro-Inflammatory Biomarkers in Breast Cancer Survivors.
José Francisco Meneses-Echávez; Robinson Ramírez-Vélez.

Disclosure: None. Objective: To determine the effects of exercise interventions on pro-inflammatory biomarkers in breast cancer survivors. Design: Systematic review and metaanalysis using a random-effects model. Setting: University campus – databases. Participants: Breast cancer survivors (>20 years old) without restrictions to a particular stage of treatment or therapeutic regimen (chemotherapy, radiotherapy or combination). Interventions: Exercise interventions including aerobic resistance and stretching training programs. Comparator: Conventional care or no-intervention. Search strategy: PRISMA statement was followed. Databases of Medline, Embase Scopus and Central were used until 2014. A surgical oncology unit and a rehabilitation department. To evaluate the main symptoms/disorders for oncologic patients who needed curative surgery and were addressed to a rehabilitation program. Design: Cross-sectional study. Setting: A surgical oncology unit and a rehabilitation department. Participants: 60 patients diagnosed with breast, gynaecological, urological, gastrointestinal or pancreas cancer interventions. The oncologic patients followed curative surgery. Following recovery after the surgical procedure, they were addressed to a rehabilitation specialist who performed progressive surgery.
physical training and/or physical procedures. **Main Outcome Measures:** The authors developed a 21-question survey focused on the information level of an oncologic patient by his/her surgical oncologist and rehabilitation psychiatrist/physical therapist. The survey also assessed the main disorders of a surgically treated oncologic patient who required physical therapy (massage, transcutaneous electrical nerve stimulation, or thermotherapy) and/or progressive physical training. **Level of Evidence:** Level 2. **Results:** One month after the inclusion in the rehabilitation program, 52 patients completed the survey. 63% of patients considered that the surgical oncologist provided them sufficient or great amount of information about their disease (type of cancer, stage, complications, evolution and life expectancy). 75% of patients considered that the rehabilitation team provided them sufficient or great amount of information about the effects of physical therapy and physical training on their cancer related disorders. The main symptoms or disorders the rehabilitation addressed were: pain, joint stiffness, weakness, fatigue, poor endurance, lymphedema, decline in balance, postural changes, difficulty with walking, dyspnea, insomnia, psychological aspects and physical well-being. **Conclusions:** Our study revealed that the communication of cancer patients with their surgical oncologists and rehabilitation specialists can be improved. Rehabilitation has its part in improving the physical, mental and social status of these patients.

**No. 8 Functional Outcomes for Cataplexy Secondary to Brain Tumor Resection After Treatment With Duloxetine During Inpatient Rehabilitation Program: A Case Report.** Vishwa S. Raj.

**Disclosures:** None. **Setting:** Inpatient rehabilitation facility with dedicated oncology rehabilitation program. **Patient:** A 38-year-old female with no previous medical or psychiatric history status post resection of a brain oligoastrocytoma. **Case Description:** The patient participated in a 27 day inpatient rehabilitation program. Upon admission muscle paralysis and postural collapse limited participation. Duloxetine 30 mg daily was initiated by day 5 and increased to 60 mg daily on day 12. Participation in the program improved and the patient was able to discharge to home. **Results:** With the use of the functional independence measure (FIM) the patient was admitted with a total score of 56. By day 10 the patient showed increased mood stability and functional improvement due to consistent participation. Reports of stress decreased with increased doses of duloxetine and the patient had decreased cataplectic attacks. By day 27 the patient recorded a total FIM score of 96. **Discussion:** Secondary cataplexy is a rare condition that results from depletion of the hypocretin transmitter. It can be associated with lesions of the lateral and/or posterior hypothalamus secondary to brain or brainstem tumors. Episodes of cataplexy may be induced by stress and strong emotional responses. Cholinergic and noradrenergic transmitter systems are the main focus of treatment but side effect profiles of medication limit their efficacy. Although venlafaxine has been used for treatment due to dual noradrenergic and serotonergic reuptake inhibition it has lower affinity for noradrenergic receptors compared to duloxetine. Duloxetine may provide a more effective alternative to decrease cataplectic attacks due to increased noradrenergic effects. To our knowledge this is the first case report of improved functional outcomes in brain tumor patients with cataplexy who were treated with duloxetine. **Conclusions:** Duloxetine may be an effective treatment in improving functional outcomes for individuals with cataplexy secondary to brain tumor resection.

**CARDIO-PULMONARY REHABILITATION**

**No. 10 Single Oxygen Inhalations Stabilize Oxygen Saturation in Patient Suffering From Emphysema: A Case Report.** Evren Atabas; Volker Pähle; Zuhra Jung-Atabas.

**Disclosure:** None. **Setting:** Outpatient center for physical and rehabilitation medicine in cooperation with a sportsmedical physiotherapy training center. **Patient:** A 57-year-old female continuously oxygen-dependent patient with emphysema and respiratory insufficiency. **Case Description:** The patient was receiving resistance training in the sportsmedical center because of low back pain. As soon as she discontinued pure oxygen insufflation, oxygen saturation dropped immediately. The oxygen tank was quite heavy for transportation with the wheeled walker so life quality was also impaired massively. As the equipment for applying singlet oxygen is much easier to handle than an oxygen tank, the idea arose of exchanging applications with each other in a controlled experimental setting under the supervision of a medical doctor. **Assessment/Results:** At the beginning of our experiment oxygen saturation was stable between 96-97% during pure oxygen insufflation. After 4 minutes insufflation was stopped resulting in an expected immediate drop of saturation under 92%. We then started singlet oxygen and interestingly observed a rise of the oxygen saturation to satisfactory levels of again 96-98% without dropping for 15 minutes till the end of this experiment. The patient did not report any side effects of the procedure. **Discussion:** This is the first reported case to our knowledge of exchanging pure oxygen insufflation with singlet oxygen. Interestingly oxygen saturation during both applications was comparably and equally stable. **Conclusion:** As singlet oxygen is won directly from breathing air without needing an extra oxygen tank it could be an alternative to pure oxygen insufflation. Further experiments are needed in order to see if our observations are reproducible with other patients and if a long term usage of singlet oxygen shows any side effect and therefore could be an alternative to pure oxygen.

**No. 11 Impact of Pulmonary Rehabilitation Program in Patients With Diffuse Parenchymal Lung Disease. Two Years Experience at the National Institute of Respiratory Diseases.** Giovanna Barragán Méndez; Sarai Toral Freyre; Cecilia Anorbe Borquez; Susana Galicia Amor.

**Background:** Patients with diffuse parenchymal lung diseases (PWDPLD), cough, effort dyspnea and fatigue in chronic and advanced stages of the disease limit their exercise capacity that impacts their quality of life. Treatment includes medical management and a pulmonary rehabilitation program (PRP). **Objectives:** To assess the impact of a pulmonary rehabilitation program in patients with PWDPLD in a cohort followed for two years. Outcome measured six-minute walk, life quality questionnaire and SF36. **Material and Methods:** We used a longitudinal descriptive study in a sample of convenience followed for 2 years. Inclusion criteria: PWDPLD, > 18 years, both genders; stable cardiopulmonary status, stable steroid dose not to exceed 10 mg per day, signed informed consent. Subjects participated in 36 sessions of pulmonary physiotherapy using a bicycle and arm ergometer limited by signs and symptoms. 6-minute walk and SF-36 were measured prior and at the completion of the program. Statistical analysis included average with standard deviation and t-Student test. Results presented on 19 patients: 13 men; Pre average 6 minute distance walked was 401 ± 130m and post was 464 ± 110m (p = 0.03). SF36 score before 73.88 ± 12.49 post 84 (p = 0.04). **Conclusions:** PWDPLD patients who completed PRP improved distance walked with reduction in symptoms and improvement in general health, mental anxiety and depression. The heterogeneous nature of this group is a limitation in this study.

**No. 12 Comparative Study of Patients With Respiratory Rehabilitation Treatment vs No Treatment After Thoracic Surgery.** Paulina Flores Guillins; Maialen Fernandez De Retana Achutegui; María Jesus Condón Huerta.

**Objective:** To study whether the rehabilitation treatment is beneficial in reducing postoperative complications and hospital stay in comparison
with no physiotherapy. Setting: Third level general hospital. Design: Retrospective double cohort. Participants: 215 subjects divided in two groups. No physiotherapy group (n=115) and physiotherapy group (n=123). Interventions: Data collection over a two-year period identifying any complications that occurred one month after surgery or during the hospital stay. Evidence level: 3. Results: 10 patients were lost from the no physiotherapy group leaving a total of 105 in this group, 28 of them developed cardio-pulmonary complications (CPC) versus 77 with no complications. In the physiotherapy group 13 patients were lost leaving 110 in the group; 17 developed CPC versus 93 with no complications, with a CI 95% (0.58) and a p < 0.040. In relation to hospital stay, the no physiotherapy group had a mean stay of 15.56 compared to the physiotherapy group of 12.17 with a p < 0.01. Conclusion: Respiratory physiotherapy treatment implemented in our hospital has statistically significantly reduced postoperative cardiopulmonary complications and the hospital average stay.

No. 13 Functional Profile of the Patient with Chronic Obstructive Lung Disease Utilizing ICF. Galicia Amor Susana; Martínez De León Linda; Bahos Mejía Omar; Fernández Plata Rosario.

Objectives: To determine the deficits in body functions and structures and activity limitations and participation according to ICF and describe possible environmental factors in patients with chronic obstructive lung disease (COLD). Material and Method: A prospective cross-sectional study with a group of patients with COLD: deficits in function and body structure were identified as well as perceived limitations in activities and restrictions in participation based on ICF. Results: 44% of 75 patients had severe impairment in function and structure of the neuro-musculoskeletal system and respiratory failure; these limitations manifested themselves during walking, transportation, washing and dressing; restriction on procurement of goods and sexual relationships and employment with financial remuneration. Conclusions: In a group of patients with COLD: 1. The impact on performance is not directly related to global initiative for chronic obstructive lung disease 2. Most patients demonstrated deficiencies in structure and function not only of the respiratory system but also of the neuro-musculoskeletal system. 3. Limitation or restriction in activities that involve mobility that may interfere with remuneration.

No. 15 Pompe Disease Late-Onset: A Case Report. Agustin Gutierrez Ruíz; Joaquina Prieto Prieto; Amaia Laita Legarreta; Maria Carmen Percaz Bados (Cruces University Hospital, Barakaldo, Spain).

Disclosure: None. Setting: Tertiary care hospital. Patient: A 41-year-old man asthmatic. Case Description: 09/08/2012: Resection of a painful mass tumour in the right side of the rib cage as curative treatment including posterior arch of sixth, seventh, and eighth rib transverse process and D7. Pathological anatomy (PA): enchondroma with free margins. Fourteen months later a recurrence was found including fourth and fifth rib paravertebral muscles, rhomboid minor and major, and parietal pleura. Third, fourth, and fifth rib's posterolateral arch with transverse processes ninth rib's posterior arch parietal pleura and paravertebral muscle D4-D8 were resected. PA: chondrosarcoma. Bone reconstruction was performed with three osteosynthesis plates from vertebral body to the healthy part of the rib using steel wire. Left anchor dorsal flap was sutured to right anchor dorsal and trapezus. Another surgery was needed after chylothorax appearance and D6 plate detachment. Assessment/Results: After the intervention: expectation difficulties right scoliosis, and spine instability. Treatment: Respiratory physiotherapy, motor physiotherapy in spine unit, and spinal orthoses. Goals: Lungs re-expansion, effective cough, and spine balance. She has an obstructive and restrictive respiratory syndrome. She is currently independent to perform daily living activities. Discussion: We present the approach to rehabilitation after surgical treatment of chondrosarcoma. Conclusion: Surgery is the only curative treatment for well-differentiated chondrosarcoma. Multidisciplinary approach was needed including neurosurgery, plastic surgery, thoracic surgery and postoperative care in ICU. Pulmonary and musculoskeletal rehabilitation is imperative to achieve as much functionality and autonomy's grade as possible with the new morphological and functional characteristics of the patient performing prophylaxis of possible complications: respiratory (atelectasis, pleural effusion and infection), orthopedic, and neuromuscular.

No. 16 Multidisciplinary Approach to Rib Cage Chondrosarcoma Resection: A Case Report. Agustin Gutierrez Ruíz; Amaia Laita Legarreta; Joaquina Prieto Prieto; Juan Andres Alava Menica (Cruces University Hospital, Spain).

Disclosure: None. Setting: Tertiary care hospital. Patient: A 41-year-old woman asthmatic. Case Description: 09/08/2012: Resection of a painful mass tumour in the right side of the rib cage as curative treatment including posterior arch of sixth, seventh, and eighth rib transverse process and D7. Pathological anatomy (PA): enchondroma with free margins. Fourteen months later a recurrence was found including fourth and fifth rib paravertebral muscles, rhomboid minor and major, and parietal pleura. Third, fourth, and fifth rib's posterolateral arch with transverse processes ninth rib's posterior arch parietal pleura and paravertebral muscle D4-D8 were resected. PA: chondrosarcoma. Bone reconstruction was performed with three osteosynthesis plates from vertebral body to the healthy part of the rib using steel wire. Left anchor dorsal flap was sutured to right anchor dorsal and trapezus. Another surgery was needed after chylothorax appearance and D6 plate detachment. Assessment/Results: After the intervention: expectation difficulties right scoliosis, and spine instability. Treatment: Respiratory physiotherapy, motor physiotherapy in spine unit, and spinal orthoses. Goals: Lungs re-expansion, effective cough, and spine balance. She has an obstructive and restrictive respiratory syndrome. She is currently independent to perform daily living activities. Discussion: We present the approach to rehabilitation after surgical treatment of chondrosarcoma. Conclusion: Surgery is the only curative treatment for well-differentiated chondrosarcoma. Multidisciplinary approach was needed including neurosurgery, plastic surgery, thoracic surgery and postoperative care in ICU. Pulmonary and musculoskeletal rehabilitation is imperative to achieve as much functionality and autonomy's grade as possible with the new morphological and functional characteristics of the patient performing prophylaxis of possible complications: respiratory (atelectasis, pleural effusion and infection), orthopedic, and neuromuscular.

No. 17 Natriuretic Brain Pro-Peptid (PRO-BNP 1-76) Changes in Patients with Chronic Heart Failure Enrolled in a Controlled Supervised Exercise Protocol Within a Cardiac Rehabilitation Program. Luz Helena Lugo Agudelo; Jesús Alberto Pita Contreras; Ana Milena García Montoya; Juan Manuel Senior Sánchez.

Objective: Evaluate PRO-BNP levels, oxygen consumption (VO2), functional class, and quality of life in patients with chronic heart failure after participating in an exercise program. Methodology: A clinical controlled trial was performed: it was double blinded with an aleatory number sequence as the randomization method. Patients were assigned to one of two groups: intervention program (supervised exercise program) and control group (community based exercise). Nct02087670. Location: Cardiac rehabilitation program. Participants: Patients older than 18 years diagnosed with heart failure (NYHA) II-IV for more than...
six months. Interventions: 12 sessions of controlled supervised exercise protocol within a cardiac rehabilitation program and educational program.

Main outcomes: The main outcome in the study were the PRO-BNP level at 8 weeks the secondary outcomes were VO₂ changes in the exercise test functional capacity and quality of life. Evidence level: 1.

Results: 23 patients were included in the intervention group and 26 in the control group. Five patients died, six did not complete the evaluation, and one patient did not perform the exercise test. 17 patients were analyzed in the intervention group and 20 in the control group. After completing the supervised exercise program PRO-BNP and VO₂ levels did not change in a statistically significant way between the groups. The quality of life evaluated with the medical outcome study (SF-36) improved in the intervention group on the next dimensions: change in health status perception (p 0.007) emotional performance (p 0.011) physical performance (p 0.006) physical function (p 0.004), mental health (p 0.009) and overall health (p 0.01). Conclusion: A supervised exercise program in patients with heart failure does not modify the PRO-BNP level or the VO₂ at 8 weeks however it does improve health related quality of life.

No. 18 Benefits of Cardiac Rehabilitation in Heart Failure Patients Receiving Continuous-Flow Left Ventricular Assist Device in Early Postoperative Period.
Chen-Yu Hung; Su-Yuan Chen; Shooi-Shan Wang; Ching Lan.

Objective: To investigate the effect of cardiac rehabilitation (CR) on the exercise capacity, physiological variables of ventilatory efficiency during submaximal exercise and health-related quality of life (HRQOL) among heart failure patients receiving the second-generation continuous-flow left ventricular assist device (LVAD) in the early postoperative period.


Participants: Clinically stable heart failure patients who received continuous-flow LVAD implantation during 2011-2013 at a university hospital were recruited for this study. Interventions: Outpatient CR.

Main Outcome Measures: We performed cardiopulmonary exercise testing (CPET) at baseline and after CR. The outcome variables included peak oxygen uptake (peak VO₂), peak workload ventilation-to-carbon dioxide output (VE/VO₂) slope, oxygen uptake efficiency slope (OUES) and oxygen uptake efficiency plateau (OUEP). The HRQOL was evaluated by the medical outcomes trust 36-item health survey (SF-36).

Level of Evidence: Level 3 evidence. Results: Four patients (age 44.5 ± 6.2 years; 3 men 1 woman) participated in a 2-month outpatient CR program at 35 ± 12 days after LVAD implantation. After CR obvious increase in peak VO₂ (13.1 ± 2.0 to 16.3 ± 1.1 ml/kg/min), peak workload (54 ± 14 to 73 ± 16 watt), OUES (1228 ± 229 to 1390 ± 318 ml/min/log (U/min)), OUEP (310.0 ± 4.6 to 335.5 ± 1.9 ml/l) and decreased VE/VO₂ slope (35.8 ± 2.7 to 31.1 ± 4.3) were observed. Increase of SF-36 HRQOL scores was also observed in physical functioning (58.8 ± 8.5 to 77.5 ± 22.2) and role physical (18.8 ± 37.5 to 50.0 ± 57.7). Conclusions: CR is safe and beneficial for exercise capacity ventilatory efficiency and HRQOL in heart failure patients using continuous-flow LVAD in early postoperative period.

No. 19 Effects of Music and Exercise Combination on Cardiac Autonomic Nervous System.
Tiantian Jia; Yoshiko Sakata; Misa Mura; Masahiro Kohzuki.

Disclosure: None. Objective: Exercise increases sympathetic nervous activity. The exercise-induced sympathetic activation could trigger fatal events such as ventricular arrhythmia and sudden cardiac death. Previous studies reported that music increased parasympathetic nervous activity. Music may therefore attenuate the exercise-increased sympathetic nervous activity. To establish this hypothesis we investigated effects of music and exercise combination on cardiac autonomic nervous system.

Design: Cross-over study. Setting: Listening to music and exercise.

Participants: Thirty healthy adults. Interventions: Subjects participated in four sessions on four separate days: 1) a music session, 2) a bicycling session, 3) a music and bicycling session and 4) a sedentary session.

Subjects were asked to listen to their favorite music in the music session, to exercise on a cycle ergometer in the bicycling session, and to exercise while listening to the music in the music and bicycling session. Each session proceeded for fifteen minutes. Main Outcome Measures: Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), and cardiac autonomic nervous activity. Level of Evidence: level 1 (likely reliable). Results: Music significantly decreased HR, SBP, and DBP accompanied with the significant increase of high frequency power (HF) which was obtained an index of parasympathetic nervous activity by power spectrum analysis of heart rate fluctuations. Exercise significantly increased HR and the ratio of low frequency power to HF (L/H) which indicated the sympathetic nervous activity whereas it significantly decreased HF. Exercise and music combination did not significantly increased L/H and not decreased HF. Conclusions: This study demonstrated that music increased the parasympathetic nervous activity and tended to attenuate the exercise-increased sympathetic nervous activity in healthy adults. Music may be an effective approach for preventing fatal cardiac events during exercise.

No. 20 Accuracy of Heart Rate Measurement Using Smartphone and Prototype Application During Treadmill Exercise.
Se-Eung Noh, M.D; Jin-Seok Lee Deng; Hyun-Jun Kim; Min-Cheol Joo.

Objective: To evaluate the accuracy of heart rate measurement by using iPhone 4s and EKG telemetry. Methods: This study was performed at Wonkwang University School of Medicine Iksan, Republic of Korea during treadmill exercise. Participants: 29 healthy adult volunteers. Interventions: To measure heart rate, volunteers grabbed smartphone in hand and index finger placed on the camera of an iPhone 4s for 1 minute. The iPhone 4s can record a pulsatile photo-plethysmogram signal from fingertip using the built-in camera lens and the prototype application can analyze pulse rate fluctuation. Results: Three measurements were measured heart rate at resting stage, during exercise at Bruce Stage II, Bruce Stage III, and recovery stage by the prototype application using iPhone 4s and EKG telemetry. Conclusions: The iPhone 4s and EKG telemetry were 75.0% (100/132) accurate and HR and the ratio of low frequency power to HF (L/H) which indicated the sympathetic nervous activity whereas it significantly decreased HF. Exercise and music combination did not significantly increased L/H and not decreased HF. Conclusions: This study demonstrated that music increased the parasympathetic nervous activity and tended to attenuate the exercise-increased sympathetic nervous activity in healthy adults. Music may be an effective approach for preventing fatal cardiac events during exercise.

No. 21 The Paradox of Obesity and Its Relationship to Cardiorespiratory Fitness in Patients With Heart Failure.
Robinson Ramirez-Vélez; Lisbeth Triviño-Quintero; Juan Carlos Ávila.

Disclosure: None. Objective: The aim of this study was to evaluate the relationship between the “obesity paradox” with cardiosrespiratory
fitness in patients with heart failure (HF).

**Design:** A cross-sectional study.

**Setting:** Tertiary care cardiovascular hospital.

**Participants:** 40 patients with HF.

**Interventions:** None.

**Main Outcome Measures:** Body mass index (BMI) was measured as an indicator of obesity and the risk was classified according to international benchmarks. We compared the cardiorespiratory fitness by 6-min walk test (6MWT), oxygen consumption by VO₂ max, distance and the number of steps such as indicators of fitness.

**Results:** We performed a cross-sectional descriptive study in 40 patients with HF (age 66.8 ± 11.4 years, BMI 27.4 ± 4.8 kg·m⁻², LVEF 40.5 ± 8.3%). In subjects with BMI >26 kg·m⁻² negative correlations were observed in the distance by 6MWT (r̂ Spearman = -0.50), number of steps (r̂ Spearman = -0.45), VO₂ max (r̂ = -0.49) and LVEF (r̂ = -0.32). Conclusion: This study suggests that “obesity paradox” is not related to a higher standard cardiopulmonary by VO₂ max.

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**No. 23 Utility of Introducing a Pulmonary Rehabilitation Program in Pediatric Population With Chronic Pneumopathy in a Pediatric Hospital in Bogota, Colombia: Pilot Study.**

**Edicson Ruiz Ospeña; Doris Valencia Valencia.**

**Disclosure:** None.

**Objective:** To introduce the first structured program of pulmonary rehabilitation tailored for pediatric population in Bogota, Colombia, and to evaluate the utility of its introduction in children with chronic pneumopathy.

**Setting:** 4th level pediatric hospital in Bogota, Colombia.

**Participants:** 10 children between 8 and 15 years old with chronic pneumopathy referred to our unit of pediatric rehabilitation.

**Interventions:** Ambulatory program of pulmonary rehabilitation which consisted of physical conditioning through aerobic exercise and inspiratory muscle training through respiratory biofeedback. Additionally we provided a document explaining an inspiratory muscle exercise house program to be practiced every day.

**Main Outcome Measures:** Functional capacity measured with 6 minute walk test, quality of life measured with kid screen - 27 tool and requirements of supplementary oxygen.

**Results:** After completing 25 sessions of ambulatory pulmonary rehabilitation program there was an increasing in functional capacity given by better compliance at 6 minute walk test, diminished requirements of use of supplementary oxygen, and better perception of quality of life by the child him/herself and his/her family.

**Conclusions:** Programs of pulmonary rehabilitation should be considered not only in adults but also as an important component of integral management of children with chronic pneumopathy in our medical environment. This program is the first of this kind in our country.

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**No. 26 Relationship Between Cardiopulmonary Responses to Exercise Onset and Anaerobic Threshold in People With Heart Failure.**

**Yamamoto Sawako; Furukawa Yorimitsu; Nitta Osamu.**

**Disclosure:** None.

**Objective:** It has been demonstrated that higher aerobic capacity leads to decreased mortality. However little is known about cardiopulmonary responses to exercise onset under the influence of aerobic capacity. Aim of this study was to investigate the relationship between cardiopulmonary responses to exercise onset and aerobic threshold in people with heart failure.

**Setting:** General hospital.

**Participants:** 28 male subjects (mean age: 63.9 years; SD: 11.3 years; range: 36-82 years) with heart failure participated in this study. They had been admitted to hospital for cardiac rehabilitation due to their heart failure.

**Interventions:** In the study participants underwent a sub-maximal cardiopulmonary exercise test to determine oxygen uptake at their anaerobic threshold (AT) level using cycle ergometry.

**Main Outcome:** AT and their increases in integrated value of oxygen uptake in four minutes from exercise onset were calculated as cardiopulmonary responses. The Pearson’s correlation analysis was used to assess the relationship between cardiopulmonary responses to exercise onset and oxygen uptake at participants AT. All statistical tests with a p-value<0.05 were considered statistically significant using IBM SPSS statistics (version 20).

**Results:** The average increase in oxygen uptake on exercise onset was 9.1 ml/kg (SD=2.4) and the average oxygen uptake at AT was 9 ml/kg/min (SD=1.4). Oxygen uptake at AT was related to integrated value of oxygen uptake on exercise onset (r=0.57 p<0.05).

**Conclusions:** These results suggested that an easily and safely obtained measurement of physical fitness is related to integrated value of oxygen uptake in four minutes from exercise onset. Therefore integrated value of oxygen uptake in four minutes from exercise onset could be helpful to assess aerobic capacity in people with heart failure.

**Acknowledgement:** Authors thank all subjects.

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**EDUCATION AND ADMINISTRATION**

**No. 28 Pain Reduction in Inpatients With Low Back Pain Disability.**

**Elena Aldinoff; Sharona Yoseph, MD; Vadim Bluvstein; Amiram Catz.**

**Disclosure:** None.

**Objective:** To assess pain reduction during rehabilitation in patients with chronic low back pain disability (CLBP).

**Design:** Retrospective evaluation using inpatient records.

**Setting:** The Loewenstein Hospital Inpatient CLBP program.

**Participants:** One hundred CLBP inpatients admitted during 2000-2009. Patients after spinal surgery during the six months before admission with a significant neurological deficit or with non-surgical medical problems that may cause disability were excluded.

**Intervention:** A functional restoration program carried out by a multidisciplinary team that included task performance assessment, pain reduction, cognitive behavioral, social and ergonomic interventions and exposure to functional and physical training of gradually increasing difficulty irrespective of pain perception.

**Main Outcome Measures:** Pain change assessed using a 7-point scale where 0 representing a worsening of pain and 6 representing complete pain relief.

**Level of Evidence:** Level 1.

**Results:** At discharge from rehabilitation 60% of the inpatients reported some pain relief. Twenty two percent reported substantial or moderate improvement in pain. Pain relief was smaller (p<0.05) in patients with neurological deficit and correlated weakly with use of narcotic drugs at discharge from rehabilitation (r=0.211, p<0.05). No significant correlation was found between change in pain and admission age, gender, length of stay in rehabilitation, functional condition at admission, and the improvement in function during rehabilitation.

**Conclusions:** The inpatient rehabilitation program contributed to pain relief in many of the most difficult CLBP patients although the relief was prominent only in a relatively small portion of the patients. The improvement in pain was independent of most patient background data but pain relief was not a condition for successful functional restoration.

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**No. 30 Training Seminars for Disaster Rehabilitation Coordinators to Prepare for Massive Disasters in Japan.**

**Meigen Liu, MD PhD; Sawako Ohtaki, MS; Atsuko Hori; Masaki Kurihara.**

**Disclosure:** None.

**Objective:** The Japanese Disaster Rehabilitation Assistance Team (JRAT) was organized after the 2011 great East Japan earthquake and disaster and has been engaged in multidisciplinary disaster relief activities as well as training seminars targeted at enhancing preparedness for future disasters. The purpose is to study preliminary effectiveness of the seminars.

**Design:** Questionnaire survey.

**Participants:** 278 rehabilitation professionals who attended the 4 seminars as a multidisciplinary team representing each of the 47 prefectures in Japan (47 physiatrists, 45 nurses, 47 physical therapists, 47 occupational therapists, 46 speech therapists, 37 care managers, and 9 administrative
officials). Their median age and median years of professional careers were 43 and 17. Setting: Training seminars. Interventions: A 2-day seminar consisting of 10 short lectures to master basic knowledge related with disaster relief and 5 practice sessions simulating coordination in the disaster setting. Main Outcome Measures: Past experience of disaster relief, the change of comprehension scores (25 items total score 100) before and after the seminar, and the disaster-related activities that were initiated after returning to their communities. Results: 83 participants (30%) had experience of previously attending disaster-related seminars and 96 (34%) had experience of previously engaging in disaster relief. The median comprehension score improved from 17.5 to 61.0 (p<0.0001 Wilcoxon’s signed rank test). After returning to their own communities, disaster-related activities like multidisciplinary team meetings, briefing seminars, training seminars, and collaboration with local governments were initiated in all 47 prefectures. Conclusions: The change in comprehension scores and the initiation of community activities suggested preliminary effectiveness of the seminars. In a country like Japan where massive earthquakes are inevitable it is a great step forward to enhance disaster preparedness to have trained rehabilitation disaster coordinator teams in all prefectures.

No. 31 Understanding Adherence to Physiotherapy: Findings From Observational Clinical Study in Patients With Asthma.
Robinson Ramírez-Veléz; Diana Durán-Palomino; Adriana Campos Rodríguez; Jaime Matínez-Santa.

Disclosure: None. Objective: Health care provider adherence to asthma guidelines is poor. National study aimed to investigate current adherence of the recommendations in respiratory rehabilitation raised by the British Thoracic Society in the management of asthma among physiotherapists from both the primary and secondary care settings. Design: A cross-sectional study. Setting: Ten general hospitals in the four main cities of Colombia. Participants: 224 physiotherapists. Interventions: None. Main Outcome Measures: This self-report questionnaire was used to identify interventions and components of respiratory rehabilitation programs as recommended by the British Thoracic Society (from 1 for “always applied” to 5 for “never applied”). Demographic and practice data were collected. Results: The sample included 224 physiotherapists of which 169 were women (75.4%) and 55 were men (24.5%). Most of the sample age ranged from 20 to 29 years old (56.7%). Breathing exercises “an intervention with high level of evidence (grade A)” always applied in 35 3% of physiotherapists. In addition we found low response rates of interventions with moderate grade of recommendation (grade B) such as the Butexiko breathing technique and use of suitable tools (i.e: asthma-specific quality of life measure, measures of anxiety and depression and the Nijmegen questionnaire) was response (94% and 21%) respectively among respondents. Conclusions: We confirm important differences in therapeutic assistant components of the respiratory rehabilitation raised by the British Thoracic Society for patients with asthma.

ELECTRODIAGNOSIS

No. 34 Intra-rater Reliability and Level of Agreement of Measurements From H-reflex in Healthy People.
Mayerly Carolina Anaya Niño; Mayerly Carolina; Anaya Niño; Esperanza Herrera Villabona.

Objective: To assess the intra-rater reliability and agreement of the measurement parameters from Hoffmann reflex (H-reflex) registered in the soleus muscle of healthy subjects. Design: Evaluation of diagnostic tests with cross-sectional sampling. Setting: School of Physical Therapy, Bucaramanga, Colombia. Participants: The H reflex was elicited in 5 healthy participants (2 male and 3 females) age (25±4.17 years old) BMI (22.9±1.6 kg/m²). Interventions: The measurements were previously standardized. Subsequently the measurements were performed on each subject’s right leg by the same evaluator in two sessions with a minimum interval of 24 hours. The H-reflex was obtained in the soleus muscle by stimulation of the posterior tibial nerve in the popliteal fossa following a previously described method. Recruitment curves were obtained for H-reflex and motor waves and normalized as a percentage of maximal M-wave and motor threshold. We analyzed the intraclass correlation coefficient (ICC2k) and the Bland and Altman’s limits of agreement of the electrophysiological variables. Main Outcome Measures: Electrophysiological measures that are used to assess neuromuscular excitability: latency amplitude duration of the wave H and M and ratios Hmax/Mmax and HSLP/MSLP. Level of Evidence: Level I. Results: The ICC obtained for latency, amplitude, and duration of the M-wave were 0.85, 0.99, and 0.87, respectively, for the H-wave ICC were 0.46, 0.97, and 0.99, respectively. The ratios Hmax/Mmax and HSLP/MSLP showed very good reliability (ICC 0.87 and 0.92, respectively). Bland Altman analysis determined mean difference near zero for all variables although confidence limits were wide; the best results were observed for the duration (-0.06 [-0.203-0.323]) and Hmax/Mmax ratio (-0.069 [-0.253-0.116]). Conclusions: The results indicate that the evaluated tests have good reproducibility and level of agreement in healthy people. However further studies are required to determine their reliability in participants with any pathology.

No. 35 Agenesis of the Abductor Pollicis Brevis and Atrophy of the Flexor Pollicis Longus Muscles: A Case Report.
Koray Aydemir; Yasin Demir, MD (Gulhane); Volvek Yilmaz; Arif Kenan Tan (Military Medical Academy, Department of Physical Medicine and Rehabilitation, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey).

Disclosure: None. Setting: Tertiary care university hospital. Patient: A 21-year-old male with agenesis of the abductor pollicis brevis (APB) and atrophy of the flexor pollicis longus (FPL) muscles. Case Description: The patient presented to our clinic with weakness and dysfunction in his right hand. On physical examination, thenar eminence was flatter, the metacarpophalangeal joint of the thumb was 20 degrees ulnar deviated. Thumb flexion, abduction, and opposition were limited and weak (1/5 motor strength). The distal phalanx could be flexed slightly. Overall right hand function was not satisfactory and the cosmetic image was unpleasant. Assessments/Results: Ultrasonography of the hand revealed agenesis of the APB and atrophy of the FPL muscles. Magnetic resonance imaging supported these findings additionally reporting that the FPL tendon was normal at the wrist level but was atrophic after exiting the flexor retinaculum. Electrophysiological examination showed that the thenar branch of the median nerve was involved. Motor unit potentials and right median nerve compound muscle action potential in the APB muscle could not be obtained. Discussion: Congenital absence of the APB is a very rare condition and is usually associated with other congenital anomalies. Thenar aplasia is considered a partial form of the embryonic radial ray defect before the differentiation stage. The anomalies of thenar muscles are seen in several diseases and syndromes. There were no other diseases in our case. Conclusion: A rare case of selective absence of the APB and atrophy of the FPL which has not been previously reported is herewith presented. Congenital absence of the APB muscle should be kept in mind in patients with thenar eminence atrophy. Reprinted with permission.

No. 37 Antidromic Median Palmar Sensory Latency: A New Test in Diagnosis of Carpal Tunnel Syndrome.
Jorge Diaz-Ruiz; Fernando Ortiz-Corredor.

Introduction: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy in clinical practice. It is important to describe techniques easy to perform and having good sensitivity and specificity. Objective: Develop a new test in the diagnosis of CTS which must
be highly sensitive and specific in the same way should reduce the number of tests that are used to support a diagnosis of CTS.

Methods: 89 patients with a diagnosis of CTS were evaluated. A dromic median palmar sensory latency (APMSL) was recorded in the palm using an electrode over the motor point of the second lumbrical interossei muscle. Median nerve electrical stimulation was performed using a fixed distance of 8 cm proximal to the active recording electrode at the wrist and the peak latency was used. The low filter was 10 Hz, high filter 2 kHz, sweep duration 2 ms, and sensitivity 20 μV. The abnormal cutoff based upon 168 normal controls was: 2.1 ms (range 1.4-2.1 mean 1.8 SD 0.1). Patients with severe conductions delays were not included. Routine motor and sensory distal latency tests of the median and ulnar nerves were also made.

Results: Sensitivity and specificity were 81% and 96%; positive and negative predictive values were 91% and 90%.

Summary/Conclusion: To our knowledge there is not a previous description of Calvani et al.

No. 39 Electromyographic Alterations in Paraspinal Muscles as Unique Finding in a Patient With Deficiency of Alpha Glucosidase.

Pedro A. Escobar, MD; Alvaro E. Rodriguez, MD; Edison Ruiz; Fernando Ortiz.

Disclosure: None. Setting: Orthopedic rehabilitation center in Bogota, Colombia. Patient: Male, 57 years old. Case Description: 7 years evolution of gait difficulties principally in sloping ground but also in climbing stairs and to achieve bipedestation from sitting position. He denied respiratory symptoms, dysphagia or sphincter incontinence. Physical examination showed weakness at shoulder and pelvic girdles. Stretch reflexes were normal and symmetrical.

Assessment/Results: Electromyography (EMG) of lower thoracic (below T8 level) and lumbar paraspinal muscles showed membrane instability signs, complex repetitive discharges, fibrillation potentials, and positive sharp waves. Quantitative EMG by interference pattern analysis and motor unit action potentials (MUAP) were normal in quadriceps, gluteus medius and gluteus maximus muscles. Creatine phosphokinase (CPK) 427. Magnetic resonance images (MRI) of brain showed white matter microangiopathy. Lumbar MRI showed atrophy of paraspinal muscles. Acid alpha-glucosidase (GAA) levels: 0.3 μmol/h (normal values > 39 μmol/h) and double mutation in GAA gene (c.-32-13t>g and c.887del cp.p296lfs*18). Discussion: Disease by deficiency of GAA enzyme produces progressive muscle disorders which leads to abnormal buildup of intracellular glycogen principally in skeletal cardiac and smooth muscles. It leads to weakness, organic failure, and consequently death. Weakness severity is variable because of degree of enzymatic deficiency displaying a wide spectrum of clinical presentation. EMG occasionally shows alterations in paraspinal muscles only.

Conclusion: Electrophysiological laboratories in case of suspicion of GAA enzyme deficiency should do paraspinal muscles EMG studies because they can be only segment with positive findings. Likewise in presence of exclusive electromyographic alterations at paraspinal muscles, we should consider GAA enzyme deficiency.

No. 40 Peripheral and Trigeminal Neuropathy in Sickle Cell Anemia: Correlation With Disease Severity and Radiological Findings.


Disclosure: None. Introduction: Sickle cell anemia (SCA) is the most common genetic disease of the blood. Sickle cell vaso-occlusive crisis (VOC) may cause painful peripheral neuropathy (PN) due to nerve ischemia or infarction. The mandible is the most vulnerable area of the face because of relatively low blood flow. Objective: To assess electrophysiologically the possibility of associated subclinical PN or trigeminal neuropathy in SCA patients and correlate results with disease severity and computed tomography (CT) findings. Methods: Fifty patients with SCA were included. Twenty of them had symptoms of PN or trigeminal neuropathy while the others are asymptomatic. 40 matched healthy individuals served as controls. Nerve conduction studies and somato-sensory evoked potentials were performed for upper and lower extremities. Trigeminal assessment was performed using trigeminal evoked potential and inferior alveolar nerve (IAN) sensory conduction studies. Findings were correlated with disease severity and CT measured mental foramen and mandibular canal dimensions. Results: Significant decay of the amplitudes of motor and sensory responses of peripheral nerves was detected. There were highly significantly longer trigeminal N13 19 20 latencies and reduced N13-P19 amplitude in patients groups in comparison to controls. There were delayed P19 latency IAN latency reduced IAN amplitude and conduction velocity in SCA patients with clinical trigeminal neuropathy versus asymptomatic ones and also in asymptomatic patients versus controls. These parameters were correlated with frequency of VOC mental foramen and mandibular canal dimensions in SCA patients with trigeminal neuropathy. Conclusions: Subclinical PN and trigeminal neuropathy may be associated with SCA. Trigeminal nerve could be affected along its peripheral or central pathway. Central affection may occur as a result of lesions in its nuclei or at the somato-sensory cortex. Electrophysiological assessment is recommended in SCA patients to diagnose and detect the level of trigeminal neuropathy. This will provide new insights into its prevention and treatment.


González Sánchez Mariana; Gómez Toledo Carmina; Aceves Dávalos Ana Eloïna Pescio Rubín; Diana Helena.

Disclosure: None. Setting: Tertiary care general hospital. Patient: A 60-year-old female with rheumatoid arthritis (RA). Case Description: The patient was diagnosed with rheumatoid arthritis 20 years ago and has had irregular treatment since then. She started with symmetric progressive general weakness predominantly in proximal muscles. It progressed until it impaired the gait, deteriorating her functional status from class II to IV on the global functional status in RA. At the clinical examination we observed normal muscle tone superficial and deep, sensibility tests were normal, and muscle strength measure by the medical research council scale was 2/5 on proximal muscles and 3/5 on distal muscles on all four limbs. Stretch reflexes were decreased on four extremities. She was diagnosed with mixed cardiomyopathy. Blood tests reported lymphocytopenia, hypocomplementemia, muscle enzymes were normal, acute phase reactants and rheumatoid factor were elevated. A nerve conduction study was performed and we found axonal variety alterations on both motor and sensorial components on four limbs. The monopolar needle electromyography reported increased insertional activity with spontaneous activity at rest (fibrillations, positive sharp waves and complex repetitive discharges), motor unit action potentials were polyphasic and we encounter delayed recruitment pattern. The salivary glands biopsy for Sjögren syndrome was reported negative. Assessments/Results: The patient was diagnosed with axonal sensory-motor polyneuropathy and was treated with corticosteroids and disease-modifying antirheumatic drugs without showing improvement. Discussion: This case confirmed what is mentioned on the reviewed bibliography for this article that peripheral neuropathy is more common in patients with more than ten years since diagnosed with RA and with deteriorating functional status. Conclusions: Axonal polyneuropathies can be a cause of weakness and disability in patients with RA. An early diagnosis and physical and medical therapy can help prevent progression of the disability.
Carlos Orlando Jimenez Martinez; Bardomiano Canseco Rivera; Flor Irene Rangel Solis; Nadhyeili Orozco Campos.

Patient: Male, 24 years old, without relevant history. Case Description: Begins in August of 2013 with limited functional for marching, throbbing pain, edema in lower legs, loss of 26% of weight, hypoesthesia in left median and ulnar sural anesthesia left superficial peroneal, deep peroneal bilateral alterations in graflexesthesia coldfeeling heat and proprioception in calves and ankles. Check-in to the CREE of Toluca in October 2013 with wasting and prolonged rest syndrome motor and sensory condition in upper and lower limbs and bilaterally symmetrical. Evaluation and Results: CMAPS and SNAPs were conducted to median ulnar, sural, deep peroneal, superficial peroneal and tibial myography with monopolar needle electrode to the muscles: deltoides, first Palmer interossei, vastus medialis, gastrocnemius median head and lumbar paraspinal L4 L5 bilaterally and automatic method for the analysis of motor unit potential with CMAPS and SNAPs: amplitudes greatly diminished and differences at the expense of left upper limb. Myography: no data of membrane instability MUAPS (PAUM) with large amplitude in upper limbs. Polyphase in lower limbs. FR increased, decreased IR, incomplete interference pattern. Discussion and Relevance: Peripheral neuropathies are disorders of the nervous system inflammatory or degenerative nature. Incidence is 1-400 persons and in many instances underdiagnosed. Mononeuropathy multiplex is a condition of 2 or more nerves in more than one limb roots and cranial nerves spontaneously or sequentially affecting nerves in different regions completely random sometimes it is the only manifestation of systemic disease. Conclusions: What were found corresponds to the description of the bibliography about the overlapped multiple mononeuropathy which was exacerbated by the presence of prolonged rest and worn-out syndrome so for that reason the electromyography was essential for the differential diagnosis.

No. 43 Is Displacement of Ulnar Nerve a Factor Affecting Axonal Injury in Ulnar Neuropathy at the Elbow? 
Sei Joo Kim; Joon Shik Yoon; Seung Nam Yang; Seok Kang.

Objective: High-resolution ultrasonography demonstrates focal nerve enlargement in entrapment neuropathies. In ulnar neuropathy at the elbow (UNE) ultrasonography can reflect the type and degree of the neuropathy as well as help in localization of the lesion. Displacement of ulnar nerve is frequently observed in UNE and affects nerve swelling. We aim to investigate the displacement of ulnar nerve could affect the axonal injury in UNE. Method: Fifty-four arms of UNE (male: 35 female: 19 mean age 48.9±14.6 years) were recruited in this study. They were classified into demyelinating group and axonal group according to electrodiagnostic. High-resolution ultrasonography was performed to evaluate the ulnar nerve movement during elbow flexion and nerve size parameter. We measured ulnar nerve cross-sectional area (CSA) at maximal swelling point around the elbow. According to the ulnar nerve movement the arms were grouped into displacement and non-displacement group. Result: In accordance with the electrophysiologic findings, axonal ulnar nerve involvement was diagnosed in 25 arms and demyelinating nerve lesion in 29 arms. According to the ulnar nerve displacement, 28 arms were non-displacement and 26 arms were displacement group. There was statistically significant difference between ulnar nerve movement during elbow flexion and type of ulnar nerve lesion (p<0.05); displacement group showed predominantly axonal lesion (61.5%) and non-displacement group showed predominantly demyelinating lesion (67.9%). In patients with axonal neuropathy the CSA was significantly larger than demyelinating group (p<0.05); 12.7±2.9mm² in demyelinating group and 17.5±7.0mm² in axonal group. There was significant difference of the CSA between displacement and non-displacement group as well (p<0.05), 12.5±2.8mm² in non-displacement group and 17.5±6.9mm² in displacement group. Conclusion: Displacement of ulnar nerve during elbow flexion could affect the axonal involvement in ulnar neuropathy at the elbow.

No. 44 Determination of an Ideal Stimulation Site of the Medial Antebrachial Cutaneous Nerve Using Ultrasound and Investigation of the Effectiveness.
Min Wook Kim; Chang Hoon Oh; Jaemin Kim.

Objective: To determine the ideal stimulation site of the medial antebrachial cutaneous nerve (MACN) using ultrasound measurement and to compare the efficiency of the new stimulation site with that of the commonly used site on the nerve conduction study. Setting: Experimental measurements by the ultrasound and the electrodiagnostic study in healthy patients. Participants: Both arms of the ten healthy participants. Main Outcome Measures: The MACN was identified in the short axis view of the ultrasound at each 0, 2, 4, 6, 8 cm proximal sites from the medial epicondyle. We measured two distances; one is from the skin to the MACN and the other is from the MACN to the median nerve. Ideal stimulation site should be located at the level which gives the shortest distance from the skin and the longest distance from the median nerve. To confirm the efficiency of the new ideal site we measured the amplitude of the MACN nerve at the ideal site against one at 4 cm proximal to the medial epicondyle. Results: Ultrasound showed the ideal stimulation site for the MACN could be the elbow crease line based on the shortest distance from the skin and the longest distance from the median nerve. However the nerve conduction study revealed that the amplitudes of the MACN was larger at the 4 cm proximal to the medial epicondyle compared with ideal stimulation site (p=0.030). Conclusions: The ideal stimulation site based on the ultrasound did not permit better stimulation site for the sensory nerve conduction study of the MACN than the conventional stimulation site. Careful adjustment of the stimulation site of the MACN on the basis of this study would contribute to an accurate sensory conduction study of the MACN.

No. 45 Laryngeal Conduction Study in Normal Recurrent Laryngeal Nerve.
Daegu Lee; Sang Jun Kim.

Objective: To supply the normal values of the motor latency of recurrent laryngeal nerve in normal recurrent laryngeal nerve. Design: Prospective open-label single arm study. Setting: Tertiary University Hospital in South Korea. Participants: Thirty-four patients with unilateral vocal cord palsy underwent nerve conduction study of recurrent laryngeal nerve. Conduction test was performed on contralateral normal side in unilateral vocal fold palsy patients. Normal recurrent laryngeal nerve was confirmed by the laryngeal electromyography. Interventions: The recording was performed at patients with unilateral vocal palsy thyroarytenoid muscles using the monopolar needle. The electrical stimulation by the monopolar needle at the 3 cm below the cricoid cartilage and just lateral to the trachea was done and its intensity was set below 15mA. Main Outcome Measures: The latency of recurrent laryngeal nerve CMAP. Level of Evidence: Level 2. Results: Average latencies of total 34 subjects recurrent laryngeal nerve were 2.02 ± 0.02 msec. Motor latencies showed normal distribution in p-p plot graph and verified by the Kolmogrov-Sminov test (p = 141). There was no significant difference in latencies between right and left sides (right 2.05 ± 0.35, left 1.98 ± 0.38, p = 141). There were no significant difference in latencies between men and women (men 2.0 ± 0.29, women 2.06 ± 0.32, p = 561). Subjects height and weight did not show any correlation with the motor latencies. Conclusion: Motor latencies of the recurrent laryngeal nerve showed high internal consistency and normal distribution. This conduction study will be helpful to diagnose the vocal cord palsy and estimate the degree of involvement such as demyelinating or conduction block which cannot be detected by the laryngeal electromyography.
Luis Mauricio Mora Caro; Cesar Forero; Fernando Ortiz; Alvaro Rodriguez.

Disclosure: None Setting: Rehabilitation center, unit of electrophysiological diagnosis Patient: 27-year-old woman. Case Description: A case of syringomyelia which was initially interpreted as a compression of the ulnar nerve in Guyon’s canal for which proposed surgical management is presented. After a new clinical and electrophysiological evaluation studies of root lesion suggestive abnormalities were found. The images showed intramedullary cystic lesion from C1 to T6 compatible with syringomyelia. We discussed how the questioning thorough clinical examination and the correct interpretation of electrophysiological studies are fundamental for a correct diagnosis. We also highlight that despite the extensive radiological findings, only discrete clinical findings were found. A correct diagnosis was made avoiding unnecessary surgery and delay in the initiation of appropriate management. Discussion: Syringomyelia can occasionally occur on a limited basis to a segment even simulating asymmetric nerve compression. Conclusion: A correct interpretation of electrophysiological studies allows injured anatomic site shortening the list of differential diagnoses.

No. 51 Unilateral Hypoplasia of Thenar Region: A Case Report.
Alvaro Rodriguez; Edicson Ruiz; Pedro Escobar; Fernando Ortiz.

Disclosure: None Setting: Pediatric rehabilitation center in Bogota, Colombia Patient: A 4-year-old boy. Case Description: Parents refer absence of right thenar eminence since birth and joint hyperlaxity at thumb without any other relevant past medical history. When the patient starts school functional limitations noted in right hand to do thumb opposition and fine grasp also fatigability during hand writing. Symptoms force him to change his handedness to achieve their activities. At physical examination there is evident right hypoplasia at thenar region with weakness at abduction and thumb flexion also for opposition and fine grasp. Tropism and functionality of the other hand muscles were normal. There were not abnormal findings at sensibility nor stretch reflexes. Motor nerve conduction studies from median and ulnar nerves with conventional techniques and register at second lumbricals and first interosseus were normal. Sensitive nerve conduction studies were normal in both upper limbs. Surface electromyography revealed absent interference pattern at right abductor pollicis brevis muscle (APB). Clinical and electrophysiological findings were compatible with APB agenesia. There was no evidence of peripheral neuropathy. Discussion: Thenar atrophy has been associated with multiple and sporadic clinic and hereditary entities. The contoured shape at this area is provided mainly by APB muscle. Its congenital absence is very unusual. Conclusion: Congenital absence of APB although unusual must be considered as differential diagnosis in patients with thenar hypoplasia. Usually this does not require medical treatment if hand function is satisfactory. Electrophysiological studies are very important to rule out any other cause of thenar hypoplasia (distal muscular dystrophy, motor neuron disease, carpal tunnel syndrome).

Edicson Ruiz Ospina; Alvaro Rodriguez Lazaro; Fernando Ortiz Corredor; Jorge Arturo Diaz Ruiz.

Disclosure: None Setting: Pediatric rehabilitation center in Bogota, Colombia Patient: A 10-year-old girl with acute flaccid paraparesis.

Case Description: From rural zone we received a 10-year-old girl who experienced 2 weeks ago sudden paraparesis which progressed to flaccid paraparesis with urinary and fecal incontinence denying any trigger factor. The patient was treated in local hospital under diagnosis suspicion of Guillain-Barré syndrome and received protocol of intravenous immunoglobulin therapy. At physical examination we found muscular atrophy of 1st dorsal interosseus and musculature of lower limbs. Flaccid paraplegia and diminished strength in fingers flexors and interosseus (medical research council 2/5). Anocutaneous and stretch reflexes absent. Sensitive level T7. Motor nerve conduction studies at upper limbs revealed very low amplitudes at lower limbs absent response at left tibial nerve and diminished amplitude at left fibular nerve. Sensitive nerve conduction studies were normal. Conventional needle electromyography showed increased insertional activity at 1st dorsal interosseus and extensor indicis proprius bilateral. After clinical and electrophysiological evaluation, we concluded a diagnosis of diffuse cervical myelopathy and ordered spine MRI which showed intramedullary hemorrhagic lesion from C6 level compatible with haemangioma. The patient was admitted for specific treatment and rehabilitation of her condition. Discussion: In this case the correct diagnosis was delayed and an adequate neurological and electrophysiological evaluation guided the diagnosis and further interventions to follow. Conclusion: Electrophysiological studies are key component of evaluation of patients with flaccid paraparesis and should be performed in order to clarify and guide diagnosis.

No. 53 Parsonage Turner Syndrome (Amyotrophic Brachial Neuritis) in Patient Diagnosed With Malaria by Plasmodium Vivax: A Case Report.
Edicson Ruiz Ospina; Luis Mauricio; Mora Caro; Jorge Diaz Ruiz; Fernando Ortiz Corredor.

Disclosure: None Setting: Rehabilitation center in Bogota, Colombia Patient: 42-year-old male with Parsonage Turner Syndrome diagnosed previously with malaria by Plasmodium vivax. Case Description: A 42-year-old male with burning pain and dysesthesia in left upper limb mainly in shoulder accompanied of progressive weakness in shoulder girdle from 3 weeks ago. The patient came referred from endemic area of malaria by Plasmodium vivax and was diagnosed with this condition approximately 30 days ago receiving oral antimalaric treatment. He denied any precipitating factor which could explain the actual condition. At physical examination we observed muscular atrophy at left shoulder girdle, diminished strength in this area mainly in deltoid and triceps brachii (3+/5 medical research council). Hypoesthesia in area innervated by lateral antebrachial cutaneous nerve. Stretch reflexes were normal. In electrophysiological evaluation motor nerve conduction studies at left median and radial nerves showed diminished amplitudes; additionally left radial nerve showed prolonged motor latencies. We also evidenced prolonged sensitive latencies at left ulnar nerve. Conventional needle electromyography showed decreased recruitment pattern in left biceps brachii. At left deltoid and supraspinatus muscles there were increased insertional activity and decreased recruitment pattern. The interference pattern was incomplete in described muscles. The diagnosis was partial injury in left brachial plexus in acute phase at level C5-C6-C7 in primary trunks suggesting amyotrophic brachial neuritis (Parsonage-Turner syndrome). Discussion: In this case the patient had no known precipitating factor to explain brachial neuritis and only had recent infection by malaria as relevant in his history. Conclusion: Parsonage-Turner Syndrome is an idiopathic condition which can be related to exaggerated inflammatory response triggered by previous systemic infection. There are few reports in literature which link brachial neuritis with malaria and this could be one of them because of chronological link and lack of any other precipitating factor.
NEUROLOGICAL REHABILITATION

No. 54 A Rare Reversible Case of Anton Syndrome and the Role of Amantadine in Management: A Case Report. Bamidele Oyebamiji Adeyemo; Jordan Howard.

Disclosures: None. Setting: Inpatient neurology service. Patient: A 76-year-old female with visual anosognosia. Case Description: 76-year-old female with history of alcohol abuse presented to the emergency room with altered mental status. CT revealed left occipital hemorrhage. Early neurologic assessments were remarkable for behavioral abnormalities including confusion, limited orientation, irritability, agitation, and removal of invenous access lines. Given suspicion of encephalopathy, EEG was performed and ruled out seizure activity. Altered mental status resolved during course, however, patient continued to perform poorly during physical therapy sessions. During course patient was noted to be unable to consistently track visually, required frequent cues with tasks identifying locations of objects and rooms, reported visual hallucinations of seeing animals or demonstrate ability to draw, count, or name objects. It became clear during the hospital stay the patient was cortically blind and even demonstrated no blink to ocular threat bilaterally. Patient adamantly denied blindness and confabulated frequently using auditory cues to guess her answers. She was diagnosed with cortical blindness and visual anosognosia (“Anton’s syndrome”) based on her deficits. Results: Patient was subsequently initiated on amantadine 100 mg bid to assist with focus during physical therapy. Interestingly she also improved in her visual deficits and blink to threat eventually resulting in resolution of blindness and restoration of her vision to baseline acuity in 5 days. Though she was also supplemented with vitamin B12 prophylactically during course it is unlikely to explain her symptoms given her normal levels throughout her hospitalization. She was successfully rehabilitated with physical therapy to an independent state. Discussion: Though her description did not classically fit the original Anton syndrome, this patient presented with a rare case of visual anosognosia in setting of hemorrhagic stroke. To our knowledge this is the first case demonstrated to be reversible with a neurostimulant agent such as amantadine.

No. 55 Effectiveness and Safety of Non-Pharmacological Interventions for Spasticity in Multiple Sclerosis: A Systematic Review. Bhasker Amatya; Fary Khan, MBBS MD FAFRM (RACP); Loredana La Mantia Marina Demetrios, MBBS FAFRM (RACP); Derick T. Wade, MN MN BCHIR FRCP MD.

Disclosure: None. Objective: To investigate the effectiveness and safety of non-pharmacological interventions for the management of spasticity in people with MS in improving patient outcomes. Design: Systematic review. Settings: Inpatient and ambulatory rehabilitation settings. Methods: A comprehensive literature search was performed using the Cochrane MS Group Trials Register which among other sources contains Cochrane Central, Medline, Embase, Cinahl, Lilacs Pedro in June 2012. All randomised controlled trials (RCTs) that reported non-pharmacological interventions for treatment of spasticity in adults with MS and compared them with some form of control intervention were included. Four review authors independently selected the studies, extracted data, and assessed the methodological quality of the studies for best-evidence synthesis. Results: Nine RCTs (n = 341 participants 301 included in analyses) investigated various types and intensities of non-pharmacological interventions for treating spasticity in adults with MS. All studies scored “low” on the methodological quality assessment implying high risk of bias. The included trials were heterogeneous in terms of: type of intervention, outcome measures, and study quality. Hence quantitative synthesis was not possible and a qualitative synthesis of “best evidence” was provided. There is “low level” evidence for: addition of active physiotherapy after BONT injection in reducing spasticity up to 12 weeks; “intermittent theta burst stimulation” as a single intervention or in combination with exercise therapy reduced spasticity after 2 weeks of treatment; short-term benefits of “repetitive transcranial magnetic stimulation” and “pulsing magnetic fields” for improved spasticity. There was no evidence of benefit to support the use of transcatheter electrical nerve stimulation, sports climbing, and vibration therapy for treating spasticity. Conclusions: A range of non-pharmacological interventions are used for the treatment of spasticity in people with MS. More robust trials are needed to build evidence for these interventions.


Objective: To review neurological rehabilitation goals and study their relation to the UK version of the functional assessment measure (UK FIM). Design: All goals were assessed on a particular day and the number of goals per patient and the therapy group leading on each goal recorded. Results: Finally every goal was recorded against one of the 36 UK FIM FAM items. Setting: Regional neurological rehabilitation unit. Participants: Neurological rehabilitation inpatients. Interventions: Not applicable. Main Outcome Measure: Rehabilitation goals and UK FIM FAM. Level of Evidence: Level 3 Results: A total of 65 (n=65) goals were identified from 25 patients. The number of goals set for each patient varied from 1 to 8. Around 41% goals were occupational therapy led, 38% physiotherapy led, 11% speech and language therapy led, and 5% by nurses and psychology. When assessed against the UK FIM FAM, most goals were around locomotion, stairs, and transfers. Other goals included meal preparation, eating, speech, orientation, and expression. There were no goals primarily for concentration, memory, problem solving, leisure activities, emotional status, and social interaction. Conclusion: Most goals were related to physical tasks. Goals for extended item like work, financial management, shopping, and laundry were not set. Goal setting is an important aspect of rehabilitation and an ideal goal should be specific, measurable, achievable, realistic, and time orientated (SMART). Patients achieve better outcomes when the team works together towards the same goal. Most clinicians find goal setting challenging, however this does improve with experience. The UK FIM FAM covers 36 items and can act as a template for setting goals.

No. 58 Inappropriately Delayed Discharges From a Regional Specialist Inpatient Neurological Rehabilitation Unit: Prospective Study. Sunil J. Ankolekar, Prof Abdel Magid Bakheit.

Objective: An important aspect of the successful management of healthcare resources is to prevent unnecessary hospitalisation and to reduce the length of patients’ hospital stay. The study of the utilisation of hospital beds in specialist neurological rehabilitation units has received little attention. The primary aim of this study is to establish the frequency and reasons of the inappropriately delayed discharges from a neurological rehabilitation unit. Design: Prospective study over six-months. Setting: Regional specialist inpatient neurological rehabilitation unit. Participants: Inpatients at a regional specialist neurological rehabilitation unit. Interventions: Not applicable. Main Outcome Measures: Shortly after hospitalisation a multidisciplinary rehabilitation team in conjunction with patients and their carers identified goals to enable the patient’s discharge. Patient’s stay in hospital after the goals have been achieved was considered inappropriately delayed discharges. Level of Evidence: Level 2 Results: Fifty-one of 67 patients admitted to the unit were included in the study. Only 19 (37.3%) of them were discharged from hospital on time. The discharge of 32 (62.7%) patients was delayed, and the delay was inappropriate in 18 (56.2%) of the 32 cases. The discharge from hospital was inappropriately delayed by an average of 51 days in nearly a third of all patients who were admitted during the study period resulting in loss of 1015 hospital bed-days.
Conclusions: The reason for inappropriately delayed discharges was the late provision of home care packages, equipment, home adaptations and transfer to institutional care by social services. This occurred despite the fact that the discharge process was started early and was supported by discharge coordinators who liaised early with social services and monitored the discharge process. Strategies to reduce the numbers of inappropriately delayed discharges should focus on more integration of health and social care.

No. 59 Ischemic Stroke After Coronary-Artery Bypass Grafting Operation: A Case Report.
Koray Aydemir; Serdar Kesikburun, MD; Umut Güzelkucuk; Yasin Demir (Gülhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey).

Disclosure: None Setting: Tertiary care university hospital Patient: A 67-year-old female with left hemiplegia. Case Description: The patient presented to our clinic with left hemiplegia. 8 days prior to the admission she had a coronary-artery bypass grafting (CABG) operation. On the post-operative first day after extubation motor deficit on the left side was examined. A right frontoparietal cerebral ischemic infarctus was detected. On physical examination, cognitive status was moderate, cooperation was established, left upper extremity was flaccid, Brunnstrom stage 1, lower extremity was Brunnstrom stage 4. Sitting balance was preserved but standing balance was poor, she was unable to mobilize independently. Assessments/Results: She had a history of diabetes mellitus and hypertension. Premorbid neurological and cognitive status was understood to be mild. Multiple chronic lacunar infarcts and glotic changes were seen in preoperative brain MRI. Preoperatively a 90% occlusion of major coronary arteries, pathologic Q waves and a 60% left ventricle ejection fraction were detected. Left hemithorax pleural effusion which was drained by a chest tube was the other major postoperative complication. We obtained improvements by ongoing neurological and cardiac rehabilitation processes. Discussion: Stroke is a major adverse neurologic outcome after cardiac surgery. Intraoperative decrease in blood pressure may lead to the stroke in our patient. Mild neurologic deficits before surgery may be a marker for cerebrovascular disease and increased risk for patients undergoing CABG. Conclusion: A case of ischemic stroke after CABG is herewith presented. Clinicians should be aware of neurologic complications after cardiac surgery. Identification of neurologic deficits is important in order to plan and initiate an appropriate rehabilitation program in a timely manner. Reprinted with permission.

No. 60 Falling and Fall-Related Factors Among Parkinson’s Disease Patients.
Koray Aydemir; Erhan Ali Ozturk, MD; Ibrahim Gundogdu; Fatma Ay tul Calc i, MD1 (Diskapi Education and Research Hospital, Department of Physical Therapy and Rehabilitation, Ankara, Turkey).

Disclosure: None. Objective: To investigate the potential risk factors for falling and the frequency of falls among Parkinson’s Disease (PD). Design: Cross-sectional study. Setting: Tertiary care university hospital. Participants: 114 ambulatory non-demented subjects with PD were included. Interventions: Not applicable. Main Outcome Measures: Reported recurrent falls (2 or more) during the previous year were described as falls. The relationship between potential risk factors for falling and the reported recurrent falls were assessed by single and multiple logistic regression models. Level of Evidence: Level 2. Results: 54 male and 60 female were investigated; mean age was 66.52±10.34 years, mean duration of the disease was 61.55±56.13 months. 40 patients (35.1%) reported recurrent falls during the previous year. Single logistic regression model showed that duration of the disease, daily levodopa dosage, Hoehn & Yahr stage, urinary incontinence, urinary tract infection, number of falls in previous year were significantly related with falling. Multiple logistic regression model is used; chronic low back pain (odds ratio [OR]: 4.99 95% confidence interval [CI]: 1.39-19.15 p=0.019) and serum vitamin D levels were significantly related with falling. When multiple logistic regression model was considered, chronic low back pain (odds ratio [OR]: 4.99 95% confidence interval [CI]: 1.39-19.15 p=0.019) and serum vitamin D levels were significantly related with falling. Conclusions: These results imply that chronic low back pain and serum vitamin D levels are related with falls in PD. Longitudinal studies are warranted to gain an increased understanding of predictors for falling in PD. Reprinted with permission.

No. 62 Muscular Deficit in Childhood: When the Falls Stop Being Accidental.
Ido ya Barca; Concepcion Cuenca; Rocio Vacas; Isabel Flores.

was myopathy if we found atrophy, muscular diminution of reflexes, motor alteration and proximal distribution. In the diseases of the union to neuromuscular los reflexes and sensitivity are not affected and in polyneuropathies the predominance is distal which does affect sensitivity.

No. 66 Sleep Disorders in Patients With Traumatic Brain Injury in a Neurorehabilitation Center.
Luís Boaventura; Filipe Bettencourt; Luís Gonçalves.

Objectives: Describe the prevalence and characteristics of sleep disorders (SD) in inpatients with traumatic brain injury (TBI) sequelae and assess the determinants of functional outcome after the rehabilitation program.
Design: Retrospective observational study. Setting: Neurorehabilitation center participants. 101 patients with TBI sequelae admitted to our center from January 2010 to October 2013. Interventions: Not applicable.

Main Outcome Measures: Prevalence and type of SD and prescribed drugs. Comparison of motor, cognitive, and total functional independence measure (FIM) scores at admission and discharge between: “TBI sequel” (TBI) versus “TBI sequela plus SD” (TBISD) patients; 18-49 years vs > 50 yrs and time period since TBI-TSTBI (<3 m, 3m-1 yr, and >1yr).

Level of Evidence: Level 2 results 127 admissions (101 patients and 26 readmissions): 80.1% males predominantly 18-35 years (yrs). We found a high prevalence of SD (54.5%), insomnia being the most reported (63.6%). Several pharmacological classes were prescribed and polymedication was frequent. Younger patients (<50 years) had higher prevalence of SD but FIM scores and overall increase were similar between age groups. TBISD patients had a similar mean FIM increase but significantly lower initial and final FIM scores when compared to TBI patients. In all 3 TS TBI groups increase in median FIM scores was equivalent. As in TBISD, the 3m-1yr group had lower overall values but also large interquartile ranges (IQR) in motor and total FIM scores. Conclusions: Overall patients from all groups had improvement in motor, cognitive and total FIM scores. FIM scores were higher in younger patients. Age did not seem to influence the FIM score variation despite differences in SD prevalence. TBISD patients had similar increase in FIM scores but large IQR reflecting intragroup heterogeneity may contribute to the lack of statistical difference. Our analysis does not take into account TBI severity or the effect of sleep medication. Comorbidities and polymedication may have interfered with functional improvement. Further deeper prospective studies are needed.

No. 67 Ramsay Hunt Syndrome: Case Report.
Luís Boaventura; Ana Campolargo; Ricardo Correia.

Setting: General hospital. Patient: 82-year-old female. Previous history of hypertension and dyslipidemia. Fully autonomous on ADLs. Case Description: Visit to the emergency room (ER) due to inability to open her right eyelid and progressive change in facial mimics over the course of 2 days accompanied by ipsilateral otalgia and hypoacusia, rotatory vertigo and dysphonia. Some studies suggest that treatment with prednisone and acyclovir may improve outcome: prospective randomised controlled trials are needed to confirm their effectiveness.

No. 68 Rehabilitation on Wallenberg Syndrome: A Case Report.
Luís Boaventura; Hugo Rodrigues; Luís Augusto.

Patient: 67-year-old male. Previous history of hypertension and dyslipidemia. Fully autonomous on ADLs. Case Description: Visit to the emergency room after presenting sudden change in speech articulation, disequilibrium while walking, and difficulty swallowing. Assessment/Results: Physical examination showed dysarthria, right-sided Horner’s syndrome, loss of pain and temperature sensation on the right hemiface and on the left hemiface. Left ataxia, dysmetria and hypotonia were found. Deep tendon reflexes and plantar reflexes were normal. Vital signs were unchanged. No changes on EKG, CBC, or electrolytes. CT scan showed a lateral right infarct of the medulla confirmed by MRI. Discussion: Lateral medullary syndrome is an uncommon stroke. Clinical findings supported by brain CT/MRI can confirm the diagnosis. It usually results from thrombosis or embolism of the vertebral or posterior inferior cerebellar arteries. Due to lesion on distinct brainstem structures a myriad of motor and sensitive dysfunctions may be encountered. These include sensitive changes from spinothalamic tract and trigeminal nucleus infarction, cerebellar symptoms from spinocerebellar fibers. Dysarthria, dysphonia and dysphagia result from nucleus ambiguous lesion. The latter is frequent but often improves rapidly. Conclusions: Cross (between cranial nerves and remaining hemibody) sensitive changes are an important diagnostic clue. Physiatrist coordination of an early and comprehensive rehabilitation program including physical, occupational and speech therapy may allow for satisfactory functional outcomes as shown in this case.

No. 69 The Assessment of Motor and Process Skills in a Patient With Multiple Sclerosis.
Ksenija Boskovic; Dragana Okićević-Obradović; Snežana Tomasević-Todorović; Svetlana Kević.

Disclosure: None. Objective: Multiple Sclerosis (MS) is a chronic inflammatory disease of the CNS beginning at the age of 20-40 years with a progressive course leading to permanent disability. The aim of this study was to assess the motor skills that are essential components necessary to perform activities of daily living (ADL) as the basis of therapeutic approaches. Setting: Randomized controlled study. Setting: Functional-ality and performance capabilities to ADL. Participants: 30 patients with MS. Interventions: We have been tested in patients with MS in terms of the assessment of functionality and performance capabilities to ADL. Main Outcome Measures: Standardized instrument for assessing motor skills and process execution activities (AMPS). Results: Motor limitations relating to specific aspects of motor functioning: body position posture of the case mobility systematic activities designed. Procedural constraints related to the purpose of comprehension of the activity, the temporal organization of the assignment, and the spatial organization of the task. The subjects with MS have more pronounced motor restrictions on the constraints in the execution of activities. The best results are achieved by the respondents in relation to understanding the purpose of the activities the spatial and temporal organization. The worst results are achieved in subject subscales mobility and proper posture. Greater degree of motor preservation is associated with a higher degree of processing functionality. Correlation of motor functioning with procedural aspects of the functioning of all the aspects of positive and very high. Conclusion: Motor skills and capabilities performing activities of daily living in patients with MS are reduced. Adequate assessment of motor ability to perform ADL and standardized instruments (AMPS) assist the integration of occupational therapy in the rehabilitation of these patients.
No. 70 Mechanical Work as a Tool for the Assessment of Muscle Synergism. 
Pedro Claudio Gonsales De Castro; Daniel Gustavo Goroso; José Augusto Fernandes Lopes; Linamara Rizzo Battistella.

When a person performs a task, there is a displacement of the center of mass (COM) an action that consumes energy and performs mechanical work. The objective of this study was to quantify muscle synergism (MS) during maintenance of posture control using total mechanical work (WTOW) obtained from body segments after motor and visual disturbance. Ten healthy male subjects mean age 25.6 (± 22.6) years were selected to participate in this study. The subjects were asked to perform trunk extension to straight position in their maximum speed under the conditions: eyes open (EO) and eyes blindfolded (EB) in order to induce some motor and visual disturbance. Data were obtained from kinematic analysis using a frequency of 200 Hz and processed by Matlab® software. Statistical analysis was performed using the Student’s t test for paired data (p > 0.05). There was a significant difference (p < 0.05) for legs at 0.60 MS and for thighs at 0.100 MS when both conditions (EO and EB) were compared. These differences may be related to somato-sensory mechanisms promoted by MS therefore suggesting that WTOW may be an invaluable tool to evaluate patients in physical rehabilitation programs.

No. 72 Retaining the Effects of Virtual Reality Therapy on Posture Control of Patients With Stroke: Preliminary Results. 
Patrícia Lima Do Amaral Santos; Pedro Claudio Gonsales De Castro; Maria Cecilia Dos Santos Moreira; Linamara Rizzo Battistella.

It is known that therapy in virtual environment (VE) using a videogame (VG) and a balance board (BB) has been widely used to achieve gains in body posture control (PC) and balance for stroke patients. However, the retention and durability of these gains are not reported in literature. This study intends to analyze the retention of PC in patients with stroke 3 months after termination of rehabilitation protocol with VR using videogame as an interface. Four subjects (either male or female) diagnosed with stroke mean age 62.25 (± 6.23) participated in this study and were randomized into two groups: a control group (CG) and an experimental group (EG). Both groups received conventional physical therapy but the EG received VR therapy as well. Twenty-four sessions of VG were performed using games designed to develop balance control. Subjects were evaluated initially using Berg balance scale and two AMTI force platforms with an acquisition frequency (AF) of 1,000 Hz; then reevaluated at the end of the protocol and three months after concluding the therapeutic protocol. A Nintendo Wii Fit Plus® videogame integrated to a balance board was used for VR. Data were processed using Matlab® Software. The following stereometric variables of posture in nearly quiet standing position were analyzed: total oscillation displacement of the COP (TOD) area (AR), maximum and minimum speed of TOD (TODVMAX, TODVMIN) as well as Berg BS score. A decrease of TOD in 20% was found on EG for both subjects when compared to CG. We found a 30% decrease of AR for EG and a decrease of 40% in both TODVMAX and TODVMIN for EG. Therefore EG showed more significant gains when compared to CG proving the efficacy of VG in improving PC and balance.

No. 73 Development of a Protocol for Treatment of Post-Stroke Patients With Virtual Reality: Preliminary Results. 
Jaqueline A. Almeida; Pedro Claudio Gonsales De Castro; Maria Cecilia Dos Santos Moreira; Linamara Rizzo Battistella.

The purpose of this study is to analyze the efficacy of a preset protocol developed for the use of virtual environment (VE) as a complementary therapy for patients by stroke and under physical rehabilitation. Six post-stroke subjects (two women and four men) mean age 56.6 ± 13.8 years were randomly assigned into two groups: a control group (CG) which received only physical rehabilitation therapy and an experimental group (EG) which received physical rehabilitation therapy associated with virtual reality (VR) therapy in accordance with a preset protocol. The VR environment consisted of videogame integrated to a balance board (BB). VR therapy was based on a preset protocol which consisted of six specific games based on posture control strategies and focused on progressive difficulty variability and repetition. A total of 48 sessions (twice per week) 40 minutes each were performed using three different games each session, five repetitions of each game with a 2-3 minute rest interval during the changes from one game to another. In addition to that the player was asked to repeat on the last 10 minutes of the session one of the three games s/he had played. A blind evaluation using Berg balance scale (BBS) was performed before and after the intervention. It was found that two of the subjects in EG showed an improvement in their score of 16% and 14%, respectively, while the third subject showed a decrease of 15%. On the other hand only one subject in the CG achieved a little improvement of 6% and another CG subject presented a decrease of 11%, and the third showed no alteration on his/her BBS scores. We conclude that physical therapy associated with VR based on the preset protocol used for this study was possibly effective since EG presented more expressive results in balance.

No. 75 Posture Analysis in Motion Laboratory. The Impact in Rehabilitation Stroke Patients: Case Report. 
Amâncio De Cássia Borte Ferreira; Pedro Claudio Gonsales De Castro; Daniel Gustavo Goroso; Linamara R. Battistella.

Objective: The goal of our study was to assess whether postural control is altered among individuals who have suffered a stroke. Setting: Physical Medicine and Rehabilitation Institute of Clinical Hospital, São Paulo University, Brazil. Materials: Hawk digital system (California, USA) and force platform (AMTI). Patient: A 53-year-old woman presented a subtle left hemiparesis post-stroke. Case Description: The protocol was applied virtual reality game of Nintendo Wii Fit Plus and conventional therapy during 48 sessions 2 day per week simultaneously. The admission assessment was made and divided into functional and biomechanical evaluation. In the functional appraisal were used the Berg balance scale and the Rivermead test. Assessment/Results: The Berg balance scale was 48 points (0-56) and the Rivermead test was 27 points before rehabilitation. After rehabilitation they achieved 55 and 26, respectively. The scoring was performed by a single certified experienced physical therapist to eliminate the interrupter variability. Measurements of postural sway in stroke patients consistently demonstrate a shift of the centre of pressure towards the non-hemiplegic side. The shift in the centre of pressure is related to asymmetrical weight bearing through the lower limbs. However in one study hemiplegic subjects bore an average of 30% (± 15%) of body weight on the paretic limb during quiet standing. This is consistent with the findings of others in which up to 70% of total body weight was carried by the nonparetic limb. The degree of postural sway is a measure of the steadiness encountered while maintaining balance. Discussion: This lateral shift is observed during quiet standing as well as during weight shifting activities. The shift in the centre of pressure is related to asymmetrical weight bearing through the lower limbs. Conclusions: The findings of our case are relevant for the implementation of quantitative measures in rehabilitation protocols for this population.

No. 76 Arm Function Assessment Scales in Stroke Rehabilitation: State of the Art in Brazilian Context. 
Rebeca Boltes Cecatto; Luciana Dotta Thais Rm Filippo; Marcel Simis Thais T. Terranova; Marta Imamura; Linamara Rizzo Battistella.

Background: Stroke is a leading cause of death in Brazil and the most frequent neurological impairment is hemiparesis, which can lead to a decreasing in upper limb motor function. Therefore tools to evaluate upper limb function are highly relevant to stroke rehabilitation. Reliability
and validity are properties of instruments that affect credibility of the rehabilitation process. The objectives of this study are identify stroke rehabilitation arm function domain of scales that have been validated to Brazilian cultural context and classify them using the International Classification of Functioning Disability and Health (ICF). 

Methods: Literature review was performed including sources from 1980 to 2013 from Medline (scale [MESH] or assessment or evaluation or measurement or Brazil or Portuguese) LILACS (stroke and evaluation and (instance: “regional”)) and SCIELO (stroke and evaluation) databases. Only stroke patients and validation studies in Brazilian cultural context of stroke assessment scales that contain a function arm domain were selected. Data extraction: after reviewing the 7778 abstracts resulting from searching, 13 papers have been selected. Five independent researchers have analyzed the articles. One study has been excluded because it does not contain an arm function evaluation and the other because the study doesn’t involve the Brazilian cultural context.

Findings: 11 different scales (Johsen-Taylor test, stroke impact scale, Rankin scale, functional independence measure, Barthel index, NIHSS motor activity log, Wolf motor function test, Fugl-Meyer assessment, Scandinavian stroke scale, Nottingham sensory assessment for stroke patients). Interpretation: Only 11 commonly used scales that evaluated the arm function are validated in Brazilian cultural context. Future studies should also include instrumental evaluation according to the participation ICF domain.

No. 77 Frenchay Aphasia Screening Test Validity in Post Stroke Colombian Patients. Camilo Chaves; Ma. De Los Angeles Tamayo, SLP; Fernando Ortiz.

Disclosure: None. Objective: To establish the validity of the Frenchay aphasia screening test (FAST) in Colombian population to establish the criterion validity of the FAST by comparing it with a diagnostic and evaluation aphasia battery. Setting: Impatient post stroke adult population in Bogota, Colombia. Participants: 65 patients (men and women) older than 18 years who were hospitalized because of first-time stroke within a 30 day course. Interventions: We applied the FAST in the stroke patients in two different times and by two different observers. To a 10 patient subgroup we applied the Boston diagnostic aphasia examination. Then we compared the results between the two FAST observers and between the FAST and the Boston diagnostic aphasia examination to establish the validity criterion and the interobserver validity of the FAST. Main Outcome Measures: Inter-rater validity of the FAST, FAST and Boston diagnostic aphasia examination, correlation time of the FAST application. Results: The kappa index between the FAST interobserver application was 0.8 or greater. When comparing the FAST and the Boston diagnostic aphasia examination the Spearman correlation was of at least 0.6. The FAST application time was between 5-10 minutes. Conclusions: The FAST showed an excellent interrater validity. The FAST showed a good correlation with the Boston diagnostic aphasia examination. The FAST was an easy and brief tool for screening aphasia.

No. 79 Association of CASP Gene Polymorphisms and Ischemic Stroke. Jinnmann Chon; Minho Park; Seung Yeol Lee.

There are several evidences of the correlation between apoptosis and ischemic stroke (IS). Apoptosis can influence neuronal cell death and neuroprotection of brain tissue thereby may have effect on the development and clinical severity of IS. The purpose of this study is to investigate whether the polymorphisms of CASP 3 gene (rs4647602, intron A/C and rs1049216; UTR C/T) and CASP9 (rs1052576; Gln/Arg G/A and rs1052571; Ser/Val T/C) were associated with the development, clinical severity and daily activities in IS. Genomic DNA from 110 IS patients and 201 healthy control subjects were extracted and polymerase chain reaction products were sequenced. In order to investigate the association of polymorphisms and the development modified Barthel index (K-MBI) score and National Institutes of Health Stroke Scale (K-NIHSS), multiple logistic regression models were analyzed. These results revealed that a single nucleotide polymorphism (SNP) of CASP3 (rs1049216; UTR C/T) and a missense SNP of CASP9 (rs1052571, Ser/Val T/C) was associated with the development of IS. Polymorphism of untranslated region of CASP3 (REI049216) has association with the development of IS (in codominant1 model OR = 0.51 95% CI=0.29-0.88 p=0.017 in dominant model OR=0.57 95% CI=0.34-0.97 p=0.034 in overdominant model OR=0.50 95% CI=0.29-0.87 p=0.011). A missense SNP of CASP9 gene (rs1052571 Ser/Val) was associated with the development of IS (OR=1.93 95% CI=1.05-3.55 p=0.034 in recessive model). These results indicate the possibility that CASP3 and CASP9 gene CASP3 (RS1049216 and RS1052571) is a marker for the development of IS.

No. 80 Programa de Terapia Cognitiva Integral en Pacientes Con Afectación Cognitiva Secundaria a Enfermedad Vascular Cerebral Isquémica. David Adrian Delgado Ruiz; Dra. Orefía Martínez Villa.

Divulgación: Ninguna. Objetivo: Mejorar el déficit cognitivo de los pacientes con enfermedad vascular cerebral isquémica. Diseño: Estudio observacional prospectivo longitudinal de cohorte. Configuración: programa de terapia cognitiva con una evaluación inicial y final. Nivel de evidencia: IIIB - III. Participantes: Treinta y cinco hombres y doce mujeres (47 pacientes) con diagnóstico de enfermedad vascular cerebral y déficit cognitivo de ambos sexos edad de 40 a 70 años. Se valoró el estado cognitivo inicial y final con el test de monumental el test pfeiffer y la prueba del reloj. Se aplico el programa de terapia cognitiva por 20 sesiones consistió en actividades cognitivas memoria gnosias y praxias cálculo y funciones ejecutivas atención razonamiento y lenguaje.

Resultados: En la evaluación inicial del nivel cognitivo con los test MMSE Pfeiffer y prueba de reloj se encontró predominio del déficit leve en un 74.46%. Las áreas que mostraron más afectación de acuerdo a test de MMSE fueron la orientación memoria inmediata atención y cálculo recuerdo diferido lenguaje y construcción. Al finalizar el programa de terapia cognitiva integral el déficit leve mejoró en un 61.7%. En relación con la mejoría de las funciones valoradas el porcentaje que se encontró mediante el test de prueba de reloj fue de un 60.1% para las funciones visoperceptivas visomotora visoconstructiva planificación y ejecución motoras expresadas en cada una de las pruebas valoradas con una significancia estadística de p < de 0.05. Conclusión: El programa de terapia integral cognitiva mejora el deterioro cognitivo en pacientes con enfermedad vascular cerebral isquémica.

No. 81 Realidad Virtual Como Terapia Complementaria en el Tratamiento De Pacientes Con Parálisis Cerebral Infantil En Edad Escolar. David Adrian Delgado Ruiz; Dra. Amparo Asenath Lugo Calles; Irene Rodríguez Ramírez.

Divulgación: Ninguna. Objetivo: Valorar el beneficio en independencia funcional utilizando la escala weFIM con el uso de realidad virtual como terapia complementaria en pacientes con parálisis cerebral infantil. Diseño: Estudio cuasiexperimental descriptivo no ciego longitudinal y prospectivo. Nivel de evidencia: II Y III. Participantes: Incluimos 6 pacientes con las siguientes características: derechohabientes en edad escolar diagnóstico PCI clasificación funcional motora gruesa grados i al iii clasificación topográfica de hemiparesia con puntaje 0 a 2 escala tardieu. Resultados: Realizamos una valoración inicial y final se aplicaron 10 sesiones de terapia con el uso de la consola wii y el software wii Sports en juegos de baseball y box durante 20 minutos por sesión. Se realizó una evaluación final y análisis estadístico de los resultados con el paquete SPSS bajo un nivel de confianza de 95% con las pruebas de chi cuadrado y de Friedman con el coeficiente de concordancia de Kendall obtuvimos
La realidad virtual como terapia complementaria mostró resultados significativos en la independencia funcional.

**Conclusión:** La realidad virtual como terapia complementaria mostró resultados significativos en la independencia funcional.

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**No. 82 Comprehensive Therapy Program in Patients With Cognitive Affectation Due to Ischemic Cerebrovascular Disease.**

David Adrian Delgado Ruiz; Ofelia Martínez Villa.

**Disclosure:** None  

**Objective:** To improve the cognitive deficit in patients with ischemic stroke.  

**Design:** Observational prospective longitudinal cohort study.  

**Level of Evidence:** II-III.  

**Configuration:** Cognitive therapy program with initial and final evaluations.  

**Participants:** Thirty five male and twelve female (forty seven patients) with ischemic cerebrovascular disease and cognitive deficit from 40 to 70 years. The initial and final cognitive status was measured with mini-mental, Pfeiffer and clock tests. A 20 session cognitive therapy program was provided. It included cognitive practical and executive therapy, memory, calculus, attention, reasoning, and language exercises.  

**Main Measures:** The results were analyzed using the Wilcoxon SPSSvs 10 statistical package (significance p <0.05).  

**Results:** In the initial assessment of cognitive level with MSSE, Pfeiffer and clock tests, prevalence of 74.46% mild deficit was found. Areas that showed impairment according to MSSE were orientation, immediate memory, attention, calculus, delayed recall, language and construction. At the end of the comprehensive cognitive therapy mild deficit improved 61.7%. We found a 60.1% improvement in motor planning and execution and visual-perceptive motor and constructive functions evaluated with the clock test showing statistical significance correlation of p <0.05.  

**Conclusion:** The comprehensive cognitive therapy improves cognitive impairment in patients with ischemic stroke.

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**No. 84 Patient Registry of Outcomes in Spasticity (PROS) Care World.**

Alberto Esquenazi; Nathaniel Mayer; Stella Lee.

**Objectives:** To provide insight into the real-world assessment, treatment, and outcomes in patients after stroke and traumatic brain injury (TBI) treated for spasticity with chemodenervating and neurolytic agents.  

**Design:** Prospective multicenter observational study.  

**Setting:** Multicenter with 29 participating sites globally.  

**Participants:** 122 TBI and 539 post-stroke patients.  

**Interventions:** Clinically indicated botulinumtoxinA or phenol injection.  

**Main Outcome Measures:** Ashworth score pain global assessment and satisfaction.  

**Level of Evidence:** Level 1.  

**Results:** The most commonly treated pattern of dysfunction in the upper limb (UL) was the flexed wrist (27.2%) with flexor carpi radialis (FCR) (31.0%) being the most frequently treated muscle. The total onabotulinumtoxinA dose used per patient in the UL was 312.2 ± 175.80U and for 5.0% phenol 6.4 ± 3.2cc. The most commonly treated pattern of dysfunction in the lower limb (LL) was the equinovarus/equinus foot (64.2%) with the medial/lateral gastrocnemius (25.1%) being the most frequently treated muscles. The total onabotulinumtoxinA dose used per patient in the lower limb was 260.1 ± 134.6U and for 7.0% phenol 5.6 cc ± 2.4. There was a significant improvement in the Ashworth score (p<0.0001). The foot showed the largest reduction in pain score -3.9 ± 3.3. Nearly half of the patients reported they were satisfied (45.9%) with their overall treatment.  

**Conclusion:** The comprehensive botulinumtoxinA treatment improves satisfaction in patients with ischemic stroke.

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**No. 85 Spatiotemporal Changes in Gait Performance Due to OnabotulinumtoxinA Injection to Lower Limb Muscles in Patients With Upper Motor Neuron Syndrome.**

Alberto Esquenazi; Patrizio Sale, MD; Daniel Moon; Amanda Wikoff, BS.

**Objective:** To evaluate the effects of onabotulinumtoxinA (ONABOTA) on spatiotemporal walking parameters of patients with equinovarus-related gait dysfunction caused by upper motor neuron syndrome (UMNS).  

**Design:** Retrospective before and after intervention analysis.  

**Setting:** Gait analysis laboratory.  

**Participants:** A total of 42 patients with UMNS (19 male 23 female) with ages ranging from 18-78. Stroke and traumatic brain injury were the predominant diagnoses.  

**Interventions:** Patient records were retrospectively reviewed for spatiotemporal data before and after ONABOTA injection to the ankle muscles. For data collection patients walked down a 12 meter walkway multiple times at their self-selected velocity. Using electrical stimulation guidance, up to 6 selected lower extremity muscles were injected with ONABOTA. The most common muscles injected were medial and lateral gastrocnemius followed by soleus and tibialis posterior. The average ONABOTA injection dose used was 320±107U. Within 10 weeks of injection patients had their spatiotemporal data recorded again.  

**Main Outcome Measures:** Spatiotemporal parameters of walking assessed before the injection (T0) and within 10 weeks post injection (T1).  

**Results:** Statistically significant improvement was seen on average walking velocity between pre and post injection at T0=0.40±0.26 m/s and T1=0.48±0.29 m/s (p=0.0001) and cadence at T0=0.63±0.23 steps/min and T1=0.70±0.23 steps/min (p=0.0001). There was a decrease in stance time on the unaffected leg at T0=74.93±9.13% and T1=73.05±7.72% (p=0.039) suggesting the patient felt more stable on the affected limb. Increased velocity appears to be related to increase in step length and cadence.  

**Conclusions:** This study demonstrated that ONABOTA injection to the ankle muscles is an effective way to significantly improve gait velocity in adult patients with UMNS. Other studies have not demonstrated a significant increase in walking velocity in a large group of patients after ONABOTA injection to the ankle muscles.  

**Level of Evidence:** Level II  

**Financial Disclosure:** None.

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**No. 86 Pre-Clinical Validation of a Robot Aided Physiotherapy System for Practicing ADL Tasks in Patients Post-Stroke.**

Gabor Fazekas; Zoltan Denes; Iibolya Tavaszi; András Toth.

**Disclosure:** None  

**Objective:** There was a pre-clinical study to verify ergonomic compliance of the REHAROB robotic therapeutic system that supports upper limb physiotherapy of patients with spastic paresis. The research question is whether normal exercise trajectories pre-defined for means of small (S), medium (M), and large (L) size ranges derived from anthropometric design theory are comfortable for randomly selected subjects.  

**Design:** Non-blinded pilot study.  

**Setting:** Biomedical laboratory of a rehabilitation institute.  

**Participants:** 9 healthy volunteers classified into 3 anatomically defined sizes of the Hungarian adult population: S size (n=2) if smaller than M size, M size (n=3) if height is between 164.07 cm and 175.36 cm, L size (n=4) if higher than M size.  

**Interventions:** The REHAROB robotic therapeutic system was connected to the elbow, to the hand, and to the fingers of the subject. Five reach and grasp type activities of daily living (ADL) tasks were practiced via the selected S/M/L normal trajectories with the assistance of the robot: 1. Cup 2. Phone 3. Zipper 4. Doorhandle 5. Towel.  

**Main Outcome Measures:** Force and torque acting between the robotic system and the subject were measured at the elbow, at the hand, and at the fingers. Subjects were asked if the force/torque attained was comfortable.  

**Level of Evidence:** Level 2.  

**Results:** 5 of the subjects declared discomfort after the exercises. 6 of the subjects falling between size range borders ±2.5 cm produced on average 47% higher peak force and torque than those of the rest.  

**Conclusions:** Trisection of the normal height range for subjects into S/M/L sizes led to insufficient
No. 87 A Role for Amantadine in the Chest Management of a Patient With Acquired Brain Injury and COPD.
Ashraf Gango; Dr S. Anklekar; Dr A. Rasheed; Mr D. Badwan (Central England Rehabilitation Unit, Leamington Spa Hospital Warwickshire UK).

Disclosure: None. Setting: Specialised Neuro-Rehabilitation Hospital in England. Patient: 62-year-old Mr. K undergoing neurorehabilitation for choroid plexus papilloma grade I acquired obstructive hydrocephalus and COPD. Case Description: Mr. K presented with left-sided tremor and gait disturbances. MRI scan revealed a large lesion in the posterior fossa. Histology revealed a posterior fossa ependymoma and he underwent a subtotal resection and subsequent radiotherapy in 1965. In 2012 he had a tumour resurgence and underwent a re-exploration operation of the posterior fossa and a subtotal resection of a choroid plexus papilloma grade I. His post-operative course was marked by hydrocephalus ventriculitis and seizures. As a result Mr. K was left with brainstem dysfunction with ataxia, impaired external ocular movements, and severe spastic dystharia. Mr. K had frequent episodes of chest infections during which he becomes somnolent and unresponsiveness for up to 24 hours. During the episodes his ABG shows type II respiratory failure with PCO2 about 8 and bicarbonate level of 30 to 32. Following a trial of amantadine, Mr. K’s oxygen saturation improved and PCO2 level normalised. The production of secretions has reduced and he became able to tolerate increasingly long periods of weaning off oxygen. Mr. K became able to vocalise and communicate with his family using a speaking valve. Discussion: Mr. K’s degree of somnolence cannot be solely by the degree of hypercapnia as a result of COPD exacerbation. It is suggested here that an injury to the reticular activating system was an important aggravating factor. The off-licence use of amantadine resulted in a dramatic improvement of Mr. K’s chest function and degree of awareness. Conclusion: Neurostimulants could play an important role in the management of chest complications of acquired brain injury. This role needs further elucidation.

No. 88 Presentation and Management of Challenging Behaviour in Patients With Traumatic Brain Injury (TBI): A Case Series Study in a Specialised Neuro-Rehabilitation Hospital.
Ashraf Gango; Dr S. Anklekar; Dr A. Rasheed; Mr D. Badwan (Central England Rehabilitation Unit, Leamington Spa Hospital, Warwickshire, UK).

Disclosures: None. Objective: Management of TBI-associated challenging behaviour in neuro-rehabilitation. Design: Retrospective case series study of patients identified with challenging behaviour based on Emerson (1995) definition of challenging behaviour: “Culturally abnormal behaviour of such an intensity, frequency or duration that the physical safety of the person or others is likely to be placed in serious jeopardy or behaviour which is likely to seriously limit use of or result in the person being denied access to ordinary community facilities.” Participants: Inpatients at the Central England Rehabilitation Unit (CERU), Leamington Spa Hospital, between April and November 2013. Outcome Measures: Primary outcome measures were the presenting mode of challenging behaviour and treatment outcome. The treatment outcome was identified as the type of medication and the documented reduction in severity, frequency, or type of challenging behavioural patterns. A secondary outcome measure was the engagement in rehabilitation activities. Results: Records of 16 patients were examined in the study period. 64% were in the 35-50 years age group; the rest 21% were either in the 18-34 and 66-80 years age groups. Prior to TBI, 86% of patients did not have a history of mental illness. The most commonly seen patterns of challenging behaviour were agitation (100%), followed by restlessness and verbal aggression (57%), each refusal of medications (43%). 29% exhibited delusions, sexual inappropriateness, and physical aggression. In 62%, symptoms were of such intensity that pharmacological therapy was commenced either without or concomitantly with non-pharmacological methods. Propranolol, carbamazepine, sodium valproate, and olanzapine were the most commonly used. Pharmacological therapy was effective in improving behaviour in 86% of the cases with less than 30% of the patients suffering from minor adverse side effects. Conclusions: Pharmacological management is effective in acutely presenting challenging behaviour.

No. 89 Relation Between Cognitive Functional Level and Decannulation Outcome in Traumatic Brain Injury Patients With Severe Dysphagia.
Javiera Gonzalez SLP; Daniel Muñoz, MD MSC.

Disclosure: None. Objective: To evaluate the relation between cognitive level at the beginning of deglutition therapy and length and status of decannulation in patients diagnosed with traumatic brain injury (TBI) and severe dysphagia. Design: Retrospective cohort study. Setting: Multidisciplinary rehabilitation program in a trauma and rehabilitation referral center. Level of Evidence: II. Participants: 16 subjects with TBI and tracheostomy who underwent deglutition assessment and therapy were included. Interventions: A combined deglutition assessment and therapy was performed by a speech-language pathologist and respiratory therapist. Main Outcome Measures: Rasch done Los Amigos Scale (RLAS), percentage of decannulated subjects, and length of decannulation measured in days. Results: 62.50% (n=10) of subjects were decannulated and length of decannulation time was 55.1 ± 41.66, in a range from 13 to 144 days. RLAS score did not reach statistically significant difference by decannulation status. However RLAS statistically correlated with length of decannulation time $t^2$ = -23.92 [95%CI: -39.82; -8.02] $p= 0.008$. Conclusions: Higher RLAS scores at beginning of deglutition therapy may predict shorter length of decannulation time in patients with TBI and severe dysphagia.

No. 90 Influence of Cognitive-Communication Disorder on Dysphagia Prognosis in Patients With Brain Injury.
Javiera González SLP; Sandra Olivares, OT; Claudio Solo; Daniel Muñoz.

Disclosure: None. Objective: To assess the influence of cognitive-communication disorder (CCD) on prognosis of dysphagia in traumatic brain injury patients. Design: Retrospective cohort study. Setting: Multidisciplinary rehabilitation program in a trauma and rehabilitation referral center. Level of Evidence: II. Participants: 54 traumatic brain injury adult patients with dysphagia divided into three groups: 43 with CCD (16 with improved CCD and 27 with no improved CCD at end-point of study) and 11 without CCD. Interventions: A communication and deglutition clinical therapy was performed in context of a multidisciplinary approach for traumatic brain injury. Main Outcome Measures: Dysphagia and CCD clinical assessment performed by an SLP. Results: Not improved CCD group ($\sigma=2.82 \pm 4.59$) $p=0.019$ was more associated with the presence of dysphagia than the improved CCD group ($\sigma=0.26 \pm 0.80$) $p=0.40$ and control group ($\sigma=0.14 \pm 0.02$) $p=0.30$. Conclusions: CCD may be an independent risk factor to maintain dysphaga despite therapy in traumatic brain injury patients regardless of severity.

No. 92 Our Experience in Huntington’s Disease.
Agustin Gutiérrez Ruiz; Leire Ortiz Fernandez; Maria Paz Abalua Ezquerra; Maria Esther Pacheco Boiso (Crues University Hospital, Spain).

Disclosure: None. Objective: To present our experience in Huntington’s Disease (HD) through a retrospective observational study developed in our outpatient hospital in the last year 2013. Setting: Tertiary care hospital. Participants: 11 patients (M:F = 7:4). Age average: 50.7 years.
old. Onset age average: 44.6 years old. Everyone has HD family history. All of them underwent genetic testing (42-47 cag repetitions); none of them were pre-symptomatic. They come from the HD outpatient hospital (neurology). Main reason for consultation: falls (10 cases). Clinical situation: 11, 7, and 9 had motor impairment, cognitive deficit, and psychiatric impairment. Initial BI average: 87.7. TFC. 6 patients are in stage I, 2 stage II, 1 stage III, and 2 stage IV.

**Main Outcome Measures:** Several markers were evaluated by our medical consultations on HD: demographics, genetics, symptoms, scales (modified Barthel index (BI), total functional capacity scale (TFC)) treatments, functional outcomes, caregiver's perception.

**Assessment/Results:** Treatment: 8 patients needed physiotherapy, 4 occupational therapy, 1 speech therapy, 3 didn't require supervised rehabilitation treatment. They were instructed by the doctor. Every accompamanist was supported. None required hospitalization. 6 needed psychiatrist's attention, 1 otorlaryngologist, and 2 nutritionist. At discharge treatment all of them were itinerant: 2 needed caregiver, 1 needed technical aids for outdoors, and 8 were independent. 1 needed thickeners. 2 needed diapers. None required institutionalization. Mean final BI: 89. Employment status: 2 were working, 4 early-retired by HD, 1 early-retired by business problems, 1 no data. None changed their employment status after treatment. All of them very satisfied with rehabilitation treatment.

**Conclusion:** There was male predominance (63.6%), age average 50.7 years old, stage I (55%), family history 100%, falls consultation 90.9%, 72.7% of them required outpatient rehabilitation: improvement in 100% of cases. 100% received doctor's education. Social and psychological support for the patient and family is essential as well as coordination among professionals and a multidisciplinary team due to disease complexity.

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**No. 93 Botulinum Toxin Type A Injections in Severe Peripheral Facial Nerve Paralysis: 3 Case Reports.**

**Agustin Gutierrez Ruiz; Leire Ortiz Fernandez; M. Paz Abaitua Ezquerra; Malte Pacheco Boiso (Cruces University Hospital, Spain).**

**Disclosure:** None. **Setting:** Tertiary care hospital. **Case Descriptions:** 3 patients with severe peripheral facial nerve paralysis (FPF) due to Herpes zoster, idiopathic, and tumor lesion. 2 women and 1 man. Mean age: 48 years old. All were treated in our clinic following general guidelines for eye protection, physiotherapy and Botulinum Toxin type A (BTA). With synkinesis, BTA was used in the muscles responsible for the severe asymmetry in the non-paralyzed side (NPS) and in the hypertonic muscles of affected side. The BTA was diluted in 2 ml of saline injecting 2.5-5 units each point with an insulin syringe and needle 30° 1/2. Sunnybrook facial grading system (SBFG) and House Brackman (HB) scales were used. Patients were photographed and their satisfaction was quantified. Initial HB: IV-V. On the follow-up assessments and reinjections were performed depending on the needs.

**Assessment/Results:** Mean final SBFG: 50.6%. There was a decrease in synkinesis subjective improvement mainly during the first month and high satisfaction with the treatment. The most frequent complaint was the difficulty in lips closure when swallowing liquid 15 days after injection. 1 mild periocular hematoma was reported in 1 patient. None reported any serious adverse effects. Every patient repeated the treatment.

**Discussion:** According to the reviewed literature, severe FPF evolves into a partial improvement with sequelae (contractures, hemifacial spasm, and synkinesis). BTA is a secure and effective treatment for improving synkinesis with satisfactory control of involuntary movements and greater patient satisfaction in severe FPF. **Conclusion:** In our experience patients reported greater satisfaction by decreasing synkinesias and improved facial symmetry during resting and voluntary movements with higher discomfort during the first 2 weeks postinjection because of weakness in mouth closure. Maximum satisfaction was reported for the first month.

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**No. 94 Status and Related Factors of Enteral Tube Tube Feeding in Patients With Acute Ischemic Stroke: A Retrospective Study.**

**Jayoung Hong; Min Ho Chun, MD, PhD (Asan Medical Center Seoul).**

**Disclosure:** None. **Objective:** To identify the extent and duration of the enteral tube feeding in ischemic stroke patients and to investigate correlation with factors such as regions of interest (ROIs) severity of stroke.

**Design:** A retrospective study. **Setting:** Tertiary care university hospital.

**Participants:** Medical records of 443 patients with first ischemic stroke were reviewed. The patients were divided as enteral feeding group and non-enteral feeding group. **Main Outcome Measures:** Brain lesion volume, lesion location (ROIs), lesion side, NIHSS score, type of feeding during admission. **Results:** Total 46 (10.38%) patients among 443 received enteral tube feeding treatment. The enteral feeding group showed higher mean NIHSS score and stroke volume than non-enteral tube feeding group (p<0.05) and had more number of ROI involvement. Among enteral tube feeding group NIHSS score and duration of enteral tube feeding were significantly correlated (r= 0.509 p<0.05). **Conclusion:** Enteral tube feeding was shown to be related to the size of ischemic stroke and multiple lesions in this study. In addition the duration of enteral tube feeding was correlated with stroke severity.

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**No. 95 Development of a Reaching Assessment Scale (RAS) for Patients With Hemiparetic Stroke.**

**Atsuko Horie, MD; Meigen Liu, MD PhD; Atsuko Nishimoto, OTR; Yoko Takahashi, RPT.**

**Objective:** Reaching is important in daily hand-finger performance. In patients with hemiparetic stroke, trunk and shoulder stabilization and coordinated movement of the scapula and upper extremity joints are impaired. However no clinically useful scale of reaching is available. The objective was to develop a reaching assessment scale (RAS) for patients with hemiparetic stroke. **Design:** Instrument development based on specialists consensus. 9 rehabilitation professionals (2 physiatrists, 5 occupational therapists, and 2 physical therapists) for consensus development. They assessed videos of reaching recorded while performing the peg-board task (5 lines by 6 rows) in 20 patients with hemiparetic stroke (mean age: 49.5±9.5, median days from stroke onset: 840, mean upper extremity proximal stroke impairment assessment set (SIAS) motor score: 3.1, finger score: 1.5). **Setting:** At a university hospital. **Main Outcome Measures:** Consensus reached by the specialists, time needed for assessment, interrater reliability assessed with weighted kappa. **Interventions:** Not applicable. **Results:** The RAS was composed of 2 components: impressionistic evaluation (IE) and analytic evaluation (AE). The IE consisted of: 1) reaching the target (smoothness, accuracy, speed, and attainment range); 2) hand functions (pinch transfer and release of peg), and 3) increase of tone with repetition. The AE consisted of: 1) trunk compensatory movement (flexion, rotation and lateral flexion), 2) shoulder (flexion, abnormal/compensatory patterns such as abduction, scapular retraction and elevation); 3) elbow extension; 4) forearm pronation; 5) wrist palmar flexion; and 6) pinching. 3-point rating system was adopted (0: very impaired; 1: moderately impaired; 2: normal). The assessment could be performed in less than 5 minutes and the interrater reliability was satisfactory. **Conclusions:** We could develop a clinically useful and objective assessment scale of reaching. We will further study its psychometric properties including internal consistency, concurrent validity and responsiveness.
No. 96 Improved Upper Extremity Functions in Patients With Chronic Severe Hemiparetic Stroke With Brain Machine Interface (BMI) Training Followed by Hybrid Assistive Neuromuscular Stimulation (HANDS) Therapy.

Abuko Horie; Toshiyuki Fujiwara, MD PhD; Meigen Liu, MD PhD; Koru Abe, OFR.

Objective: The aim was to study the effects of BMI training followed by HANDS therapy on upper extremity functions in chronic hemiparetic stroke. Design: Case series. Participants: 16 patients with chronic hemiparetic stroke (mean age: 52.1 ± 10.2, mean duration from onset: 37.6 ± 4.9 months) who could show mass finger flexion but no voluntary finger extension. Setting: At a university hospital. Main Outcome Measures: Fugl-Meyer upper extremity score (FMU), modified Ashworth scale (MAS) and motor activity log-14 (MAL-14) amount of use (AOU) scale before and immediately after the BMI training and before and immediately after the HANDS therapy. Interventions: The participants first received task-specific BMI training for 40 min a day for 10 days with the BMI system, which estimated patient’s motor intentions from the desynchronized activities of the activated neurons over the primary sensori-motor cortex recorded with EEG. Upon successful motor imagery, a motor-driven wrist-hand orthosis was activated to passively extend the parietic fingers which enabled the patient to perform a peg-board task. After BMI training patients who showed recordable electromyographic (EMG) activities from extensor digitorum communis (EDC) progressed to the HANDS therapy 8 hours a day for 3 weeks which consisted of a portable electrical stimulator and a wrist splint. The stimulator can automatically adjust stimulation intensity in proportion to the amplitude of voluntary EMG from EDC to facilitate parietic finger use in daily life. Results: We observed statistically significant improvement in FMU (21.9 ± 6.1 to 26.9 ± 8.2), MAS finger flexor (1.9 ± 1.0 to 1.4 ± 0.8), and MAL AOU (2.4 ± 2.1 to 5.1 ± 2.8) after the BMI training and further improvement was seen after the HANDS therapy (FMU: 31.9 ± 8.6, MAS finger flexor: 1.25 ± 0.75, MAL AOU: 10.6 ± 6.0). Conclusion: Combining BMI training with the HANDS therapy could be an effective therapeutic strategy for severe upper extremity paralysis after stroke.

No. 97 Clinical Observations of Treatments of Post-Stroke Deglutition Dysfunction With Acupuncture and Electric Stimulation.

Huang Zhen.

Objective: To compare therapeutic effects of acupuncture and electric stimulation on post-stroke deglutition dysfunction on the basis of rehabilitation training. Disclosure: None. Setting: General hospital. Participants: 97 patients with post-stroke deglutition dysfunction were recruited and divided into acupuncture group (A, n = 32), electric stimulation group (ES, n = 35), and control group (C, n = 30) randomly. Interventions: On the basis of conventional rehabilitation training, A group added with acupuncture while ES group received Vitalstim® electric stimulation once per day for 2 course of treatment (12-day as one treatment course). C group received only conventional treatment. Main Outcome Measures: At the end point of the observation, deglutition function was evaluated with water-drinking test, stethocatharsis scoring, and fluoroscopic examination of swallowing function. Results: After 2-course of treatments, deglutition function from three groups all improved significantly (p < 0.01). By comparison with C group, both A group and ES group displayed statistic significance (p < 0.01). By intervention the total effective rate of A group was 96.88%, with ES group 94.29%, and C group 66.67%. There was significant difference on the total effective rate among three groups (p < 0.01) while no difference between the former two groups (p > 0.01). Conclusion: The therapeutic effect of acupuncture and ES combination with rehabilitation treatment was better than that of simple rehabilitation training. As to deglutition dysfunction the therapeutic effects of acupuncture and ES were almost equivalent while the former was better than the latter and had a shorter course of treatment to severe patients. So our observation showed the advantage of therapeutic effects.

No. 98 A Randomized Comparison Trial of Balance Training Using Wii Fit Games and Conventional Weight Shifting Therapy in People With Chronic Stroke.

Jen-Wen Hung; Ching-Xia Chou; Yen-Wei Hsieh; Wen-Chi Wu.

Objective: To compare effects of Wii Fit games with conventional weight-shifting training on balance function in people with chronic stroke. Design: Single blinded randomized controlled trial. Setting: Rehabilitation department of a medical center. Participants: Persons with chronic hemiplegic stroke and balance deficits. Interventions: 12-week Wii Fit balance training or conventional weight-shifting training. Main Outcome Measures: Static standing balance was assessed by Tetrax posturography. The stability index and percentage of weight bearing on affected leg at eight positions were collected. We used timed-up-and-go and forward reach tests for dynamic balance evaluation, falls efficacy scale-international questionnaire for balance confidence assessment, and physical activity enjoyment scale to estimate enjoyment of training. Level of Evidence: Level I. Results: Wii Fit group had more improvement than control group in stability index at 3 positions including head straight with eyes open on foam surface, eyes closed on solid surface with head turned at 30 degrees to left, or head up (p = 02 04 03, respectively), however the effects could not be maintained. Conventional weight shifting training had more improvement in symmetry, weight bearing at head straight with eyes open on solid surface position than Wii Fit group did at 3-month follow-up(time-group interaction p = 03). Both groups got improvement in timed-up-and-go, forward reach tests, and fear of falling; there was no time-group intervention effects in timed-up-and-go and forward reach tests could be maintained but not fear of falling. Wii Fit group enjoyed training more than control group (p = 03). Conclusions: Wii Fit training appears to be safe, enjoyable, and effective for people with chronic stroke.

No. 99 Cerebral Blood Flow in Patients With Central Nervous Pathologies Associated With an Adequate Edentation Treatment.

I.S. Stratilat; D. Cucucireanu, MD PhD; L. Eva, MD PhD; Roxana Maria Rad Dr.

Objective: Evaluating cerebral blood flow in neurological pathologies (traumatic or stroke) in connection with normal or pathological mastication and comparing it with blood flow after adequate dental treatment. Design: Intervention study with pre/post/30/90 days follow-up. Setting: Rehabilitation Department Clinical CI Hospital, Iasi, Romania Neurosurgery and Neurological Departments, Clinical University Emergency Hospital “Prof. N. Obîru” Iasi, Romania. Participants: 60 patients admitted in the Neurological and Neurosurgery Departments in Clinical University Emergency Hospital “Prof. N. Obîru” Iasi, Romania. Interventions: Not applicable. Main Outcome Measures: We examined 60 elderly patients (30 post stroke, 30 without a stroke) analyzing cerebral blood flow and complete oro-dental diagnostic at admission. Then we provided them with full dental treatment including dental prosthetics if needed analyzing the same parameters afterwards. We evaluated patients 30 and 90 days after the treatment proving an increase in blood flow in the vital zones of the brain. Level of Evidence: Level I. Results: The role of mastication by stimulating periodontal pressure receptors is proved in increasing blood flow in motor nervous centers in frontal lobe as well as in pyramidal cells in the hippocampus (memory center). Restoring the integrity of the masticator apparatus provided an optimal functional recovery in patients post-stroke but also in general elderly population. Conclusions: Elderly patients need an active social and professional life. Most times though they retire in solitude. Beside the multiple cardio-vascular complications of old age and sedentariness, this prolonged rest from social activities lead to decreasing blood flow in certain “vital zones” of the brain. For an adequate social and professional life after retiring and providing all people with “healthy aging” a functional masticator apparatus is indispensable.
No. 100 Psychosocial Features and Burden Level in Primary Informal Caregivers of Children With Brain Injury. 
Noemí Lucero Islas Salas; Dr. Manuel De Jesús Castillejos López.

Objective: To assess the psychosocial features and burden level in primary informal caregivers (PIC) of children with brain injury from a children’s rehabilitation center. Study Design: Observational descriptive. Participants: 50 PIC were enrolled (46 women and 4 men) who were taking care of children with brain injury. A questionnaire was applied to the PIC including questions regarding their psychosocial features and then subjected to the Zarit’s burden interview to assess their level. Interventions: Not applicable. Results: Regarding the psychosocial features among the PIC 92% of the total were females and 72% of them were housekeepers; 56% were married women, 36% had high school studies, with mean 34.3 years (SD=6.71). They had taken care of their patients an average of 7.9 years and 10.78 hours daily. 56% took care of an entirely dependent patient. Among their basic activities were carrying the patient to visit the physician and to take physical therapy (100%), lifting him/her up (84%), dressing him/her up, and feeding him/her (82%). 86% informed about an impact in their economy, 78% in their mood and 68% in their physical health. 72% of the carers had noticeable burden levels which was moderate in 22% and severe in 24%. Burden factors such as direct impact of the care itself, interpersonal relationships, and expectations of self efficiency had mean values of 19.08, 4.60, and 8.36, respectively. Level of Evidence: 1. Conclusion: Psychosocial features among PIC showed a profile of adult young woman with elementary studies, married, who assists her patient to perform basic activities that otherwise the patient alone would not be able to achieve. Three quarters of the surveyed PIC had burden levels. PIC play a pivotal role in the primary care and attention of children with brain injury.

No. 102 Cerebral Activation Evoked by the Mirror Illusion of the Hand in Stroke Patients Compared to Normal Subjects. 
Jing Wang; Dohle Christian; Claire Fritzsch; Maddalena Brunetti.

Objectives: The following imaging study was designed to compare brain activation patterns evoked by the mirror illusion in single stroke patients with normal subjects. Design: Fifteen normal volunteers and five stroke patients with severe arm paresis were recruited. Cerebral activations during movement mirroring by means of a video chain were recorded with functional magnetic resonance imaging (fMRI). Single-subject analysis was performed using SPM 8. Setting: MRI department. Participants: Fifteen normal volunteers and five stroke patients with severe arm paresis were recruited. Intervention: Not applicable. Main Outcome Measures: Cerebral activation during movement mirroring. Level of Evidence: Level 1. Methods: Cerebral activations during movement mirroring by means of a video chain were recorded with functional magnetic resonance imaging (fMRI). Single-subject analysis was performed using SPM 8. Results: For normal subjects ten and thirteen subjects displayed lateralized cerebral activations evoked by the mirror illusion while moving their right and left hand, respectively. The magnitude of this effect in the precuneus contralateral to the seen hand was not dependent on movement speed or subjective experience. Negative correlation of activation strength with age was found for the right hand only. The activation pattern in stroke patients is comparable to that of normal subjects and present in four out of five patients. Conclusions: In summary the mirror illusion can elicit cerebral activation contralateral to the perceived hand in the majority of single normal subjects but not in all of them. This is similar even in stroke patients with severe hemiparesis.

Tae-Min Jung, MD; Deog Young Kim, MD PhD; Dae Hyun Kim.

Case Diagnosis: Secondary lower limb dystonia after left middle cerebral artery (MCA) infarction. Patient: A 49-year-old woman presented with paroxysmal hypertonia of the right hip knee and ankle that worsened at night for 2 months. She had a history of previous left MCA infarction and right side weakness thereafter but these symptoms improved enough for her to be able to climb up and down stairs before the start of dystonia. Case Description: There was spasticity at her right hip, knee flexor and ankle plantarflexor muscles of grade 2, 3 and 3 on the modified Ashworth scale (MAS). In the Tardieu scale R1 R2 of the knee were -90’-50’ and those of the ankle were -30’-20’. Her right hip had a limitation of range of motion of -10’ on extension. She was unable to neither stand nor sit after symptoms developed. Result: Dynamic polyelectromyography recordings were acquired to select dominant hypertonic muscles. Right ilioptos, biceps femoris long head, semitendinosus, tibialis anterior muscles demonstrated comparatively greater overactivation than the tensor fascia lata semi-membranosus and biceps femoris short head muscles. Bont-A (Botox® Allergen Co.) was injected into right ilioptos (100unit), biceps femoris long head (125unit), semitendinosus (75unit), tibialis anterior (60unit), and flexor digitorum brevis (40unit) muscles. Symptoms improved greatly after injection. In response to treatment she was able to walk indoor independently. Discussion: Because overdosage of Bont-A to patients increases complication risk and gives financial burden, this patient needs precise muscle selection. We use dynamic polyelectromyography for muscle selection to reduction dosage of Bont-A and get a good result. Conclusion: Dynamic polyelectromyography may be helpful to localize dystonic muscles.

No. 105 Comparison of Effects of Motor Learning by High Frequency Repetitive Transcranial Magnetic Stimulation of Primary Motor Cortex or Supplementary Motor Area (Randomized Crossed-Over Design). 
Yong Kyun Kim; Hyun Seok, MD PhD; Hong Jae Lee.

Objective: To observe and compare effects of repetitive transcranial magnetic stimulation (RTMS) according to application brain site (M1 vs SMA) on motor learning (explicit or implicit). Design: Randomized crossed over study. Setting: Clinical research center. Participants: Twenty-three healthy volunteers. Interventions: The motor task required learning of sequential finger movements explicitly or implicitly. It was pressing the keyboard sequentially with their right hand on seeing seven digits on the monitor and then tapping the 7 digits by memory. Subjects were instructed to hit the keyboard as fast and accurately as possible. High frequency RTMS was applied randomly on either brain area SMA or M1. By crossed over study design a week later the same task repeated. In this case RTMS was applied on the other brain area. Main Outcome Measures: Using MIDI (musical instrument digital interface) keyboard pressing task was measured before and after high frequency RTMS for motor performance (response time, movement time and accuracy). Motor cortex excitability was measured by recruitment curve before and after RTMS. Results: No carrying-over effect was observed. The accuracy and response time were not different between two stimulated areas (M1 and SMA). But movement time was significantly decreased after RTMS on both SMA and M1 especially in case of implicit learning of motor task. The amount of shortened movement time after RTMS on SMA was significantly increased compared that of decreased movement time after RTMS on M1 (p < 0.05). Recruitment curves were not different. Conclusions: In conclusion this finding supports the important role of SMA in implicit motor learning. It might be applied to improve learning of implicit motor skills in stroke patients in the future.

Deog Young Kim; Dae Hyun Kim, MD; Seeun Kim; Yoon Su Baek.

Objective: To investigate the effect of anterioposterior weight shifting training with visual feedback on gait asymmetry in post-stroke hemiplegic
patients with step length asymmetry. **Design**: Single blinded randomized controlled trial. **Setting**: University hospital. **Participants**: 30 chronic post-stroke hemiplegic patients (21 males 9 females) who were diagnosed at least 6 months prior and could walk at least ten meter independently but certainly had step length asymmetry were enrolled. **Intervention**: 15 subjects were randomly assigned to experimental group which took additional weight shifting training with visual feedback on conventional physical therapy three times a week for 6 weeks and 15 were arranged to conventional physical therapy alone group for the same period. This weight shifting feedback training system designed with F-scan plantar pressure measurement system (Tekscan Inc. USA) and gave a feedback during double supporting situation enough for subjects to shift a weight from hind foot to forefoot through precise plantar pressure and center of pressure measurement. **Main Outcome Measure**: Fugl-Meyer Assessment (FMA), functional ambulation categories (FAC), temporospatial parameter and plantar pressure analysis were obtained before training 3 weeks later at the end of the training and 6 weeks later after the training. **Level of Evidence**: 1. **Results**: All parameters on both groups were not significantly different at baseline. Using repeated ANOVA with post-hoc test trajectory length forefoot pressure/total pressure were significantly improved in experimental group compared to in control group (p<0.05); walking speed, single limb stance time of affected side, step length of unaffected side, and asymmetric index of step length in experimental group were also significantly improved compared to control group (p<0.05), but FAC, FMA and energy consumption were not. **Conclusion**: The anterioposterior weight shifting training with visual feedback may be helpful to stabilize weight bearing and promote weight shifting from hind foot to forefoot on affected limb therefore to improve the step length symmetry in post-stroke hemiplegic patients.

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**No. 107 Can the Integrity of the Corticospinal Tract Predict the Long Term Motor Outcome in Post Stroke Hemiplegic Patients?**

Deog Young Kim; Dae Hyun Kim, MD; Soo Young Park; Sung Hyun Kyung.

**Objective**: To investigate the long term outcome according to subacute diffusion tensor tractography (DTT) findings for the corticospinal tract (CST) in the post stroke hemiplegia patients. **Design**: Non-comparative study. **Setting**: University hospital. **Participants**: We recruited 38 supratentorial subacute post-stroke patients (mean age 63.4 years; male: female 30:8) who took brain MRI within 3 months from onset and any reattack was not reported within 2 years follow-up period. **Interventions**: Not applicable. **Main Outcome Measures**: Diffusion tensor images were obtained by using a 3.0-Tesla and CSTs were reconstructed by selection of fibers passing through seed and target ROIs (pontomedullary junction anterior upper-pons). The subjects were classified into four groups according to DTT findings: type A the CST originating from primary motor cortex was preserved around the lesion area; type B the CST was similar to type A except the fiber originated from the adjacent areas to the primary motor cortex; type C the CST was interrupted at or around the lesion area; type D the CST was not shown. The Fugl-Meyer motor assessment (FMA), box and block test (BBT), functional ambulation category (FAC), mini-mental status examination (MMSE) were measured at baseline and 2 years from onset and were compared between four groups. **Level of Evidence**: 1. **Results**: FMA, BBT, and FAC were significantly different according to DTT type at follow-up (p<0.05). The group A showed significantly greater improvements than group D on the FMA especially the subscale of the hand (p<0.05). The scores of BBT, FAC, and MMSE at follow-up were not significantly different between four groups. **Conclusions**: The integrity of CST may be helpful in predicting the long term motor outcome especially being reflected in upper extremity’s distal muscles.

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**No. 110 Comparison Between the Efficacy of Suprascapular Nerve Block and Intra-Articular Hyaluronic Acid Injection in Hemiplegic Shoulder Pain.**

Seung Yeol Lee, MD; Dong Suk Kim, MD; Jinmann Chon; Minho Park.

**Disclosure**: None. **Objective**: To compare the pain and functional improvement of suprascapular nerve block (SSNB) and intra-articular hyaluronic acid (HA) injection in post-stroke patients with hemiplegic shoulder pain. **Design**: Randomized controlled study. **Setting**: Inpatient hospital setting. **Participants**: 24 stroke patients randomly assigned to the SSNB (n=12) or HA (n=12) groups. **Interventions**: Ultrasound (US) guided SSNB with 10cc of 1% lidocaine and US guided intra-articular injection with 2cc of HA + 8cc of 1% lidocaine were done in each group 3 times at intervals of one week. **Main Outcome Measures**: Visual analogue scale (VAS) for pain, modified Barthel index (MBI), Fugl-Meyer scale (FMS), Brunnstrom stage, modified Ashworth scale (MAS), Wolf motor function test, brief pain inventory (BPI), and shoulder range of motion (ROM) were assessed before the injection and one week and four weeks after first injection. **Results**: There was a significant improvement in VAS scores at 4 weeks after first injection in both groups. The mean VAS difference was 33.3 (95% CI 1.84 to 4.82) and 2.92 (95% CI 1.24 to 4.59) in SSNB and HA group, respectively. But the group differences were not significant. In other variables except VAS and BPI there was no significant improvement in both groups. On several items of the BPI concerning the interference of patient’s function (activity, mood, work and enjoy) only SSNB group showed significant improvement at 4 weeks after intervention (p < 0.05) even though the group differences were not significant. **Conclusions**: Regarding pain improvement both SSNB and intra-articular HA injection were safe and effective in patient with hemiplegic shoulder pain. In the interference of patient’s function caused by pain SSNB might be slightly effective at 4-week follow up period. However further studies are required to define the superiority.

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**No. 111 Functional Recovery Despite Rapid Progression of Un-Identified Brain Mass: A Case Report.**

Eric Leung, MD; Nicholas Beatty, DO; Heidi N. Fusco.

**Setting**: Tertiary care hospital. **Patient**: A 58-year-old male with rapidly enlarging brain mass and right hemiplegia. **Case Description**: The patient presented with right-sided weakness and was found on magnetic resonance imaging (MRI) to have a left frontoparietal brain lesion. He was treated with intravenous (IV) steroids for suspected demyelinating disease. His weakness progressed over the next month and repeat MRI demonstrated a 3-centimeter-diameter ring enhancing nodular lesion that had tripled in size. Due to suspicion for tumor, neurosurgery performed left frontoparietal craniotomy and resection of lesion. Surgical pathology however was consistent with acute demyelination more consistent with tumefactive multiple sclerosis. He was admitted to acute inpatient rehabilitation (AIR) following surgery. On AIR admission he had complete right-sided hemiplegia and hypoesthesia, dysarthria, and severe cognitive-linguistic deficits. Repeat MRI 14 days post-surgery demonstrated progression of the brain lesion with hyper-intensity surrounding the mass resection that extended along the corticospinal tracts to the left cerebral peduncle. During AIR he was retreated with IV steroids for 5 days. Repeat MRI post-treatment demonstrated no response. Further inpatient workup was non-revealing and he achieved a functional level of independence to where he could be discharged home to have continued outpatient workup. **Assessment/Results**: During his 40-day AIR stay despite progression of his brain lesion he demonstrated neurological and functional improvement. On admission he was completely hemiplegic on the right with cognitive and speech deficits and was dependent for mobility and care. On AIR discharge he recovered significant upper and lower extremity strength, required minimal to moderate assistance for ambulation and self-care and could communicate wants and needs. **Discussion**: This patient demonstrated improving...
neurological function despite progression of a neurological lesion. **Conclusion:** Despite progression of an undiagnosed neurological lesion this patient demonstrates the important role of acute inpatient rehabilitation in preserving and restoring function.

**No. 112 Measurement of Problems With Self-Identity Following Traumatic Brain Injury: Development of a Concept Using Grounded Theory.**
William Levack; Pauline Boland; Nicola Kayes; Joanna Fadyl.

**Disclosure:** None. **Objective:** Change in self-identity has been identified as an issue of particular concern for people with traumatic brain injury (TBI), yet no clinical measures exist to quantify problems with sense of self that have been specifically designed for TBI populations. Rather than develop a measure based on expert opinion the aim of this qualitative study was to use the stories and lived experience of people with TBI to develop both a framework on which to base an operational measure and preliminary items for that measure. **Design:** Grounded theory based on focus group meetings with people who had experienced TBI (4-9 participants per meeting). Meetings were audio-recorded and transcribed before being analysed using constant comparative methods. Preliminary measurement items were operationalized and tested using the patient-reported outcome measurement information system cooperative group's guidelines. **Setting:** 8 urban and rural communities in New Zealand. **Participants:** 49 people (34 men 15 women) 6 months to 36 years after mild to severe TBI. **Interventions:** Not applicable. **Main Outcome Measures:** Not applicable. **Results:** The central concept emerging from the data was that of desiring to be or having lost a sense of being an integrated valued person. The 3 main subthemes were: 1) having a coherent satisfying and complete sense of onelf, 2) respect validation and acceptance by others, and 3) having a valued place in the world. The narratives from the people participating in the focus group meetings provided content for measurement items. **Conclusions:** Themes from this research have provided a strong foundation for the development of a measure of self-identity grounded in the language and experience of people with TBI. Future research will employ statistical modelling to refine and test the measurement items and psychometric properties before dissemination of the new tool.

**No. 113 Effects of Enriched Environment on the Expression of WNT5A and Nestin in Hippocampus of Rats With Traumatic Brain Injury.**
Ling Li; Shan Jiang; Ya-Na Li.

**Objective:** To study the effect of enriched environment (EE) on the expression of WNT5A and nestin in the hippocampus of rats with traumatic brain injury (TBI). **Method:** Sprague-Dawley adult male rats were made in traumatic brain injury model and then randomly assigned to model group or EE group. Another ten rats were as normal group. The rats in the model group were feed in cages while those in the EE group were feed in enriched or EE group. Atsuko Horie, MD; Atsuko Nishimoto, OTR; Yoko Takahashi, RPT.

**Disclosure:** None. **Objective:** The aim was to construct a practical motion analysis system to evaluate reaching objectively in patients with hemiparetic stroke. **Design:** Development of a quantitative evaluation system. **Participants:** 9 rehabilitation professionals (2 physiatrists, 5 occupational therapists, and 2 physical therapists) for the assessment of the usefulness and practicality of the motion analysis system. **Setting:** At a university hospital. **Main Outcome Measures:** Quebec user evaluation of satisfaction with assistive technology (QUEST) to assess clinical usefulness of the motion analysis system. **Interventions:** Reaching with the dominant upper extremity (UE) (healthy persons) or with the hemiparetic UE (stroke patients) performing the pegboard task. **Results:** A compact motion analysis system suited for the assessment of reaching was constructed. It consisted of 2 video cameras, 8 wireless inertial measurement units containing tri-axial accelerometers, tri-axial gyroscopes, and tri-axial magnetometers; and a 12-channel telemetric electromyography system. The system setup and calibration took less than 15 minutes. QUEST evaluation of the system with respect to size, weight, adjustability, safety, reliability, ease of use, comfort of use, and effectiveness yielded satisfactory results. **Conclusion:** We developed a clinically useful and practical motion analysis system to assess reaching in patients with hemiparetic stroke. We will further study test-retest reliability concurrent validity and responsiveness of the measurement parameters obtained with the system.

**No. 115 Construction of a Practical Motion Analysis System to Study Reaching in Patients With Hemiparetic Stroke.**
Meigen Liu, MD, PhD; Atsuko Horie, MD; Atsuko Nishimoto, OTR; Yoko Takahashi, RPT.

**Disclosure:** None. **Objective:** Patient demonstrates the important role of acute inpatient rehabilitation in preserving and restoring function.

**Main Outcome Measures:** Reaching with the dominant upper extremity (UE) (healthy persons) or with the hemiparetic UE (stroke patients) performing the pegboard task. **Results:** A compact motion analysis system suited for the assessment of reaching was constructed. It consisted of 2 video cameras, 8 wireless inertial measurement units containing tri-axial accelerometers, tri-axial gyroscopes, and tri-axial magnetometers; and a 12-channel telemetric electromyography system. The system setup and calibration took less than 15 minutes. QUEST evaluation of the system with respect to size, weight, adjustability, safety, durability, ease of use, comfort of use, and effectiveness yielded satisfactory results. **Conclusion:** We developed a clinically useful and practical motion analysis system to assess reaching in patients with hemiparetic stroke. We will further study test-retest reliability concurrent validity and responsiveness of the measurement parameters obtained with the system.
No. 116 Brain Machine Interface (BMI) Neurorehabilitation for Hemiparetic Upper Limb in Patients With Chronic Stroke. Meigen Liu, MD PhD; Toshiyuki Fujiwara, MD PhD; Atsuko Horie; Atsuko Nishimoto, OTR.

Disclosure: None. Objective: The aim was to examine the effectiveness of our newly developed electroencephalogram (EEG)-driven BMI training for severely paralyzed upper limb in patients with chronic stroke. Design: Case series. Participants: 26 patients with chronic hemiparetic stroke (age: 49±7.8 mean days from onset: 141±360.6) who could demonstrate voluntary mass finger flexion but no voluntary finger extension. Setting: A university hospital. Interventions: The participants received task specific BMI training for 40 min a day for 10 days with the BMI system which estimated patients’ motor intentions from the desynchronized activities of the activated neurons over the primary sensor-motor cortex recorded with surface EEG. Upon successful motor imagery a motor-driven wrist-hand orthosis was activated to passively extend the parietic fingers which enabled the patient to perform a peg-board task. Main Outcome Measures: Flug-Meyer upper extremity score (FMU), modified Ashworth scale (MAS) of finger flexors, motor activity log 14 amount of use score (MALI4-AOU), and electromyographic (EMG) activities recorded from extensor digitorum communis (EDC) before and immediately after the intervention. Results: We observed statistically significant improvement in FMU (18±5.8 to 21±6.3), MAS (1.9±1.1 to 1.3±0.8) and MALI4-AOU (3.0±1.4 to 5.5±1.9) after the intervention (Wilcoxon signed rank test p<0.01). EMG activities could not be detected from EDC before the intervention in all the participants but became recordable in 16 patients (61%) after the intervention. Conclusions: Our task specific BMI training was effective to improve motor impairment spasticity and daily use of the severely impaired upper limb. The appearance of voluntary EDC EMG enabled us to further proceed to the hybrid assistive neuromuscular dynamic stimulation (hands) therapy which can bring about further functional improvement.

No. 117 A New Program of Rehabilitation for Inpatients With Highly Complex Needs in Brazil. Liliana L. Jorge; Andressa Mota DO Nascimento De Brito; Flavia Helena; Garcia Marchi; Marcelo Riberto.

Disclosure: None. Objective: To describe the effects of four tailored inpatient neurological rehabilitation programs in a retrospective study. Setting: The Instituto de Reabilitação Lucy Montoro, Brazil. Participants: 148 adults consecutively selected within a one-year period for hospitalization were evaluated at admission, discharge, and 6 months after discharge; there were 4 diagnostic groups: stroke, traumatic brain injury, spinal cord injury, and Guillain-Barré syndrome. Main Outcome Measures: Primary outcome measures: functional independence measure (FIM™) modified Rankin scale for stroke (RANKIN), and Glasgow outcome scale (GOS). Secondary outcome measures: sociodemographic features. Results: Mean length of stay was 31.6 days. Improvement in motor FIM™, RANKIN and GOS was observed. Cognitive FIM™ increase was less evident in TBI patients. After 6 months, 37.6% of patients were unemployed, 34% still underwent outpatient rehabilitation, and 65.2% maintained gains. Conclusions: Although brief hospitalization was sufficient to promote motor and cognitive gains, heterogeneity in functional gains suggests the need to establish individualized programs. As a clinical rehabilitation impact, this is the first report on the effects from inpatients rehabilitation model in Brazil. Results bolster the creation of more customized models of rehabilitation. Controlled studies are required with larger samples and specific functional measurements to compare cost-effectiveness of inpatient and outpatient programs.

No. 118 Quantitative Sensory Evaluation of Carpal Tunnel Syndrome Using the Semmes-Weinstein Monofilament Test. Mikio Murooka; Kenji Watanabe; Koushirou Imai.

Objective: Sensory evaluation using the qualitative Semmes-Weinstein monofilament test (SWT) is useful for diagnosing carpal tunnel syndrome (CTS) but not for consecutive postsurgical evaluations. A newly developed quantitative sensory evaluation method based on SWT scoring and its application for postoperative CTS evaluation is described. Design: Cross-sectional study. Setting: Orthopedic and rehabilitation clinic of a general hospital. Participants: 150 hands of 114 CTS preoperative patients and 23 hands of 22 postoperative patients. Intervention: Not applicable. Main Outcome Measures: In SWT scoring the median nerve-nominated area was divided into 11 segments based on distal interphalangeal (DIP), proximal interphalangeal (PIP), and metacarpophalangeal (MP) joints of the thumb through ring finger and 6 palmar segments. For the thumb DIP was treated as interphalangeal (IP) and PIP and MP as MP. Each segment was scored from 0 thru 3 based on minimum pressure sensation using 6 scoring methods: 1) sum of scores distal to DIPs (0-12), 2) sum of maximum scores distal to PIPs for each finger (0-12), 3) sum of maximum scores distal to MP for each finger (0-12), 4) sum of scores distal to PIPs (0-24), 5) sum of scores distal to MPs (0-33), and 6) sum of scores of fingers and palm (0-51). Postoperatively patients were evaluated at 1 and 3 months.

No. 119 Relation Between Length of Post Traumatic Amnesia and Cognitive Functional Impairment in Adult Patients With Traumatic Brain Injury in Chile. Sandra Olivares, OT; Claudio Soto, MD; María Virginia Sáez; Daniel Muñoz.

Disclosure: None. Objective: To assess the relation between the duration of post traumatic amnesia (PTA) and cognitive functional recovery in patients with traumatic brain injury (TBI) after occupational therapy (OT) treatment. Design: Retrospective cohort study. Setting: Multidisciplinary inpatient rehabilitation program at trauma and rehabilitation referral center in Santiago, Chile. Level of Evidence: Level II. Participants: 27 inpatients with diagnosis of traumatic brain injury (TBI) and GOAT score <75 before the intervention included OT were selected. Interventions: An early functional stimulation program by OT (environmental management, cognitive stimulation, activities of daily living (ADL), training postural management and early mobilization) as part of a multidisciplinary program of TBI patient care. Main Outcome Measures: Difference in the score of scales used for functional cognitive assessment according to PTA duration. The scales used were Rancho Los Amigos scale (RLA), Montreal cognitive assessment (MOCA), Lowenstein occupational therapy cognitive assessment (LOTCA), frontal assessment battery (FAB), disability rating scale (DRS), and functional independence measure (FIM). Results: No correlations between the variation of scores in cognitive scales and PTA were observed in these patients although all the scales results showed a cognitive improvement. At the end of the rehabilitation program only 18.5% of the patients reached re employment. Longer PTA duration is associated with no reinsertion at the end of the program with OR=1.31 (1.03 – 1.45) p=0.002: Conclusion: Length of PTA may not be a predictor on the patient’s improvement in our sample. Therefore other predictive factors should be investigated for the success of this cognitive-functional therapy.

No. 120 Braden Scale and Its Association With Pressure Ulcers in Hospitalized Patients. Carlos Olvera Esquivel; Armando Lópezmanrique; Damaris Estrella Castillo; Héctor Rubio Zapata.

Objective: To determine whether or not an association exists between the Braden scale results and the presence of pressure sores in hospitalized
patients of the HGR #1 Yucatan in the services of internal medicine, surgery, and orthopedics. **Settings:** HGR no. 1. **Participants:** 57 patients were evaluated mostly between 41 and 60 years old. **Interventions:** This is a case-control study which included all patients admitted to departments of internal medicine, surgery, and orthopedics of the HGR #1 Yucatan during January 2013. In all these patients the Braden scale was applied and it was determined those who presented clinically with pressure ulcers. The selected cases were those patients who had pressure sores and the control were all the patients who had not. The presence of pressure ulcers and its degree were determined by classification designed by the National Pressure Ulcer Panel and the Agency for Health Research and Quality. The statistical analysis was based on the x2 test with a 95% significance level (p<0.05) the relative risk (RR) and the odds ratio (OR) values. **Main Outcome Measures:** The presence of pressure sores. **Level of Evidence:** 1. **Results:** 39% of which scored below the cutoff (16). Of these patients 59% presented at least one PU in a different stage. Relation age-PU was determined with an OR of 0.336 for patients over 60 years old. The association of the Braden scale with PU presented an OR of 0.435 with a score equal to or less than 16 on the scale. **Conclusions:** The Braden scale is a highly sensitive tool for assessing the risk of developing pressure ulcers in hospitalized patients with the socio-demographic characteristics of Yucatan state.

No. 121 Urinary Incontinence and Other Voiding Dysfunctions in Patients After Stroke.
Styliani Papakosta; Dimos Galliopoulos, MD; Maria Goutou; Christos Liaskos.

**Objective:** Although urinary incontinence after stroke is common with predictive value for quality of life for both patients and their caregivers, it is often overlooked. **Design:** Assessment of voiding functions one month after admission in our rehabilitation center in patients after stroke. **Setting:** Rehabilitation center. **Participants:** 114 patients (69 males) after stroke (median age 763 ± 142) were included in the study. At their admission all of them had indwelling urinary catheter (IUC). Before stroke episode only 5 patients (4 men) had IUC. Barthel score was 13.5 (0-23). 67% of them suffered from diabetes mellitus (insulin dependent in 13 patients) 76% of males was treated for benign prostate hyperplasia. **Interventions:** The patients were treated with pelvic floor biofeedback, timed urine prompted urine and education to perform intermittent catheterization.

**Main Outcome Measures:** Barthel score number of patients with voiding dysfunctions. **Level of Evidence:** 2. **Results:** One month after admission: 3 patients (2 men) with indwelling catheter had deceased. 20 of 114 patients (11 men) had remaining IUC (included all 5 patients who had catheter before stroke episode). In the subgroups of men the median Barthel score was 14.5 (range 0-25) at patients with remaining IUC, while at men who had been released from IUC the median Barthel score was 27.5 (range 10-45). In female subgroup with or without remaining IUC, the results of Barthel score was (median, range): 15, 0-25 and 26.2, 10-45 respectively. 6 patients (4 men) were educated to perform intermittent catheterization. 74% of patients without catheter complained of nocturia, 67% urgency, daytime frequency 53%. **Conclusions:** While urinary incontinence improves, other urologic complaints which can significantly impact patients and caregivers may emerge and persist. All these factors should not been underestimated because they can affect the improvement of patients after stroke.

No. 122 Determination of Motor Entry Point and Intramuscular Motor Point of Flexor Digitorum Longus for Effective Motor Point Block.
Namsu Park; Juyong Kim; Boml Seol; Myeongeun Chung.

**Objective:** Botulinum toxin injection is commonly used to manage spasticity. This study was conducted to determine the anatomical position of the intramuscular motor point (IMP) and motor entry point (MEP) of the flexor digitorum longus muscle for effective motor point block. **Methods:** 14 specimens from 8 adult Korean cadavers (5 males and 3 females age ranging from 52 to 79 years) were used for study. Reference line was set as hypothetical line between medial margin of tibial plateau and most tip of tibial malleolus. The proximal reference point was defined as most medial proximal point of tibia plateau. The distal reference point was defined as most distal tip of malleolus. Motor entry point was defined as the location where the motor nerve penetrates the muscle belly. Intramuscular motor point was defined as the location where the motor nerve ends. **Main Outcome Measures:** We measured distance from proximal reference point to MEP and IMP. Distances of MEP and IMP from proximal reference point were evaluated by raw value and by the ratio of raw value to reference length as percentage. **Results:** The mean length of the reference line was 333.96 ± 25.20 mm. Most proximal MEP was located at 107mm (32.42%) on x-coordinate. Most distal MEP was located at 260mm (69.33%) on x-coordinate. Mean of MEP was 158.03mm ± 37.39mm (46.78% ± 9.65%). Most of MEPs were located within 40-60% on x-coordinate. Mean of distance on y-coordinate was 17.83 ± 2.82 mm. Most of IMPs were located within 30-60% on x-coordinate. **Conclusion:** For effective and safe motor point block in flexor digitorum longus, optimal insertion site of needle is 40-60% from medial margin of tibial plateau. Optimal depth of needle from skin is 1.8 cm.

Jeong Mee Park, MD PhD; Dongsoo Yi, MD; Hee Kim; Hwang Min Kim.

**Patient & Case Description:** Fifty-two-year-old male who was diagnosed Guillain-Barre Syndrome (GBS) was transferred from neurology due to profoundly weakened extremities. Electromyography (EMG) results showed trigeminal nerve involvement confirming severe GBS comorbid bulbar palsy. Initially he showed very severe quadriplegic bed-ridden status with poor head control due to neck muscle weakness. The patient underwent rehabilitation program for four months and then improved and began to plateau with muscle power of upper extremity proximal to fair, distal part to poor, and lower extremity to poor grade on manual muscle test. Since his functional level showed ability to do sit to stand with moderate assist. **Results:** Robot-assist gait training was started at that time and after three months of treatment, muscle power improved such as the upper extremity proximal part was good minus, distal part was fair, lower extremity proximal part was fair, and distal part was poor. Thus his functional level improved to walk fifty meters on even surface using forearm crutch and wearing bilateral Klenzac ankle-foot orthosis (AFO). Now after one year since the cessation of robot-assist gait training he has improved to walk without AFO and only using right monocane without limitation on even surface and go up and down three stories of stairs using one monocane and wearing bilateral Klenzac ankle-foot orthosis (AFO). **Discussion:** Robot-assist gait training has shown to be effective on CNS disorders like stroke and spinal cord injury in previous studies but studies on cases with PNS disorders has not yet to be fully studied. Hence we report the impressive effect of robot-assist gait training on patient with severe GBS accompanying bulbar palsy. **Conclusion:** We report a case of treatment experience of robot-assist gait training in a patient with severe GBS leading to quadriplegia and gait disturbance with excellent functional outcome.

No. 124 Kinematic Characteristics of Gait Hemiparetic After Stroke in Overground and Treadmill With Full and Partial Body Weight Support.
Maria Solange Patiño Segura; Jose Angelo Barela; Ana Maria Forte Barela.

**Background:** Treadmill and overground level training with body weight support (BWS) improve walking after stroke but biomechanical characteristics of gait on such surfaces and weight bearing conditions are not clear yet. **Objective:** The purpose of this study was to evaluate the gait
hemiparetic in the overground and the treadmill with full and partial BWS.

**Methods:** Ten hemiparetic chronic subjects participated in this study: nine men and one woman, mean age 53 ± 8.72 years, and time evolution post-stroke of 2.8 ± 2.69 years. Patients walked on overground level at self-selected speed and in the treadmill at 0.33 m/s. In addition four weight-bearing conditions were tested: without harness, with harness, with 15% BWS, and 30% BWS. Three trials for each condition were video-taped in the sagittal plane recording the paretic and non-paretic leg and digitized using the Ariel performance analysis system (APAS). Spatio-temporal parameters and joint angles were measured. **Results:** Gait overground with 15% BWS shows statistical difference (p < 0.05) for velocity (0.50 ± 0.16 m/s), cadence (0.63 ± 0.11 strides/s), duration (1.64 ± 0.12 s), support phase (68.60 ± 2.84%), knee extension angle (3.10 ± 2.52 degrees), and ankle dorsiflexion angle (3.05 ± 1.31 degrees). Gait treadmill with 15% BWS shows statistical differences (p < 0.05) for cadence (0.71 ± 0.15 strides/s), duration (1.48 ± 0.33s), support phase (72.64 ± 4.81%), knee extension angle (6.31 ± 5.11 degrees), and ankle dorsiflexion angle (7.79 ± 2.23 degrees). **Conclusions:** Kinematic differences in gait pattern were observed especially in the paretic limb. Treadmill with 15% BWS was shorter stride duration, greater cadence, and increased support phase and joint angles while overground with 15% BWS was shorter stride length and greater velocity. Activation of a more functional pattern confirms that treadmill and overground training with partial BWS are useful procedures during the gait reeducation in poststroke patients. **Level of Evidence:** 1.

**No. 125 Spatiotemporal Gait Parameters of Parkinson’s Disease Subjects.**

Alviero Isaac Perez-Sanpablo; Claudia Hernandez-Arenas, MD; Ivett Quiñones-Urrestegui; Alicia Meneses-Peña.

**Disclosure:** None. Computerized evaluation methods are reliable and are increasingly incorporated in the evaluation of gait disorders (GD) of subjects with Parkinson’s Disease (PD) during research and clinical practice due to their higher availability and lower cost. **Objective:** To obtain sensitive and reliable parameters which define GD of PD subjects on different stages of the disease useful for further studies and clinical practice. **Setting:** Hospital. **Participants:** A descriptive transversal experiment where spatiotemporal gait parameters of 74 PD subjects were assessed. PD subjects were under stable pharmacological treatment with a Hoehn & Yahr score of 3 have a very different gait performance related to their higher availability and lower cost. On a previous study we found a set of parameters obtained by CEM with clinical significance with a level of evidence 1 which constitutes the base for the minimum set of evaluation parameters reported in further investigations about BD. **Objective:** To obtain mentioned set of parameters by a descriptive transversal experiment in PD subjects and compare the results with age matched healthy subjects. **Setting:** Hospital. **Participants:** 43 PD subjects and an age matched sample of healthy subjects. 5 PD subjects had a Hoehn & Yahr (HY) score of 1, 24 a score of 2, and 14 a score of 3. PD subjects were in one medication state under stable pharmacological treatment without visual or hearing impairments. **Main Outcome Measures:** Anterior mean displacement of center of pressure (COP), sway area, sway path length mediolateral and sway range mediolateral, sway ratios anteroposterior and mediolateral, mean squared root of velocity of the COP, and Romberg coefficient assessed during consecutive trials at eyes open and closed using the force platform Accugait (AMTI, Watertown, USA). ANOVA and Mann Whitney U tests were performed. **Results:** Sway area measured both at eyes opened and eyes closed was the only parameter capable to distinguish between PD and non PD subjects. Romberg coefficient was not sensitive. Age did not shown any effect. **Conclusions:** Sway area which relates to gait and balance items of the unified PD rating scale should be used instead of Romberg coefficient to distinguish PD subjects from controls because the latter shows masking effects even in advanced PD subjects with level of evidence 1.

**No. 126 Sway Area at Eyes Open and Closed but no Romberg Coefficient Are Sensitive Indicators to Distinguish Between Subjects With and Without Parkinson’s Disease.**

Alviero Isaac Perez-Sanpablo, MSc-Beng; Claudia Hernandez-Arenas, MD; Ivett Quiñones-Urrestegui; Alicia Meneses-Peña.

**Disclosure:** None. Computerized evaluation methods (CEM) are reliable and are increasingly incorporated in the evaluation of balance disorders (BD) of subjects with Parkinson’s Disease (PD) during research and clinical practice due to their higher availability and lower cost.
No. 128 Efficacy and Safety of AbobotulinumtoxinA in the Treatment of Cervical Dystonia: A Phase III Randomized Double-Blind Placebo-Controlled Study.
Philippe Ricault; Werner Poewe; Katalin Bihari; Marta Banach.

Objectives: To assess the ef fectiveness and safety of abobotulinumtoxinA in the treatment of cervical dystonia (CD). Design: Randomized placebo-controlled double-blind study. Setting: International multicenter study (61 sites in 11 countries). Participants: Patients diagnosed with CD were randomized to abobotulinumtoxinA 500 U (n=159) and placebo (n=54). (both arms were embedded within a three-arm trial investigating a new formulation of abobotulinumtoxinA). Interventions: Single treatment cycle with abobotulinumtoxinA (500 U) or placebo. Main Outcome Measures: Toronto Western Spasmodic Torticollis Rate Scale (TWSTRS) scores (total), investigator’s visual analog scales of symptoms (VAS; 0–100), investigator’s assessment of overall treatment success. Level of Evidence: Level I. Results: Baseline characteristics were balanced between abobotulinumtoxinA and placebo arms. At baseline, mean TWSTRS total score was 46 (SD=9) for abobotulinumtoxinA and 47 (SD=13) for placebo. At week 4 (primary ef ficacy timepoint) mean values were 31 (SD=13) and 42 (SD=13), respectively. LS mean change from baseline was signiﬁcantly higher with abobotulinumtoxinA than placebo from week 1 through week 12 (week 1: -8.2 vs. -5.5 p<0.05; week 4: -14.0 vs. -3.9 p<0.0001; week 12: -6.3 vs. -2.5 p<0.05). Ef ficacy was conﬁrmed by investigator’s VAS on symptoms from weeks 1 to 12 (statistically signiﬁcant difference at all time points) and overall treatment success (80% vs 60% at week 12, p<0.05). The safety proﬁle was as expected. Conclusions: This is the largest double-blind placebo-controlled study conducted in 61 centers in 11 countries assessing abobotulinumtoxinA (500U) in CD in both Bont-naive and non-naive patients. Significant ef ficacy was demonstrated after a single dose of abobotulinumtoxinA up to 12 weeks post-injection as assessed by change in TWSTRS score and several investigator-led assessments. Disclosure: P.P.: Ipsen employee; PW: consultancy/lecture fees (Ipsen Merz Allergan); K.B.: research support (Ipsen).

No. 130 Relationship Between Health-Related Quality of Life and Disability in Women With Peripheral Vertigo.
Robinson Ramírez-Vélez; Vanessa Vélez-León; Vanessa Lucero Gutiérrez; Celia Escobar-Hurtado.

Disclosure: None. Objective: To study the relationship between disability and health-related quality of life in women with vertigo of peripheral origin. Design: A cross-sectional study. Setting: Tertiary care neurological centre. Participants: 26 women diagnosed with vertigo. Interventions: None. Main Outcome Measures: In a self-report interview a 12-item short form (SF-12) health survey on quality of life was applied, disability was assessed with the questionnaire ‘dizziness handicap inventory’ (DHI). Measures of central tendency dispersion for the domains and types of vestibular disturbance were used and internal DHI consistency and inter-scale correlation were calculated. Results: Patients in the vestibular neuritis and Ménière groups displayed a higher level of disability according to the DHI functional (29 ± ±5.5 vs 27 ± ±8.8) and physical domains (23 ± ±4.1 vs 21 ± ±6.6). Based on the SF-12 domains greater deterioration in quality of life was perceived in physical (22 ± ±3.9 vs 22 ± ±4.6) and emotional performance (15 ± ±5.0 vs 11 ± ±6.0), respectively. Acceptable and signiﬁcant inverse correlations were found between the physical component summary (PCS-12) of the SF-12 and the emotional prospective and functional aspects of the DHI questionnaire (r=0.51 to 0.78 p<0.01). Internal consistency (Cronbach’s alpha = 0.7) of the DHI questionnaire was appropriate for the sample. Conclusions: The DHI and the SF-12 are useful practical and valid instruments for assessing the impact of dizziness on the quality of life of patients with this symptom.

No. 131 Changes of Motor Recovery in Chronic Stroke Patients.
Álvaro Rodríguez; Edison Ruiz; Jorge Díaz; Fernando Ortiz.

Disclosure: None. Objective: Determine changes in motor function recovery in stroke survivors who perform standard rehabilitation therapy during the chronic phase of their disease. Design: Descriptive and retrospective study based on consecutive records of chronic stroke patients. Setting: Rehabilitation Center in Bogotá, Colombia. Participants: 61 patients with motor sequelae of stroke with clinical evolution longer than 6 months. [Average = 13.20 months]. All patients were being treated with a standard protocol for stroke rehabilitation with conventional physical and occupational therapies. Interventions: Not applicable. Main Outcome Measures: Functional changes obtained between 2 consecutive clinical records [average time between assessments = 8.3 months] in scores of the following scales: Fugl-Meyer motor scale (FM), postural assessment scale for stroke patients (PASS), five times sit to stand test (FTSST), modified Rankin scale (MRS), Barthel index, composite functional index, modified Ashworth scale. Level of Evidence: 3. Results: We found signiﬁcant changes to functional recovery between the scores of first and second assessment at all scales applied (p<0.05); however the effect sizes were small. [FM upper limb d=0.186, FM lower limb d=0.150, PASS d=0.169, Barthel d=0.413, composite functional index d=0.420]. Conclusions: Stroke patients who continue performing a standard protocol for stroke rehabilitation after six months of evolution still continue showing small changes to motor function recovery. These changes are statistically signiﬁcant. This study strengthens the knowledge about the pattern of functional recovery and prognosis of motor recovery in chronic stroke patients providing a basis for objective and accurate assessment of therapeutic responses in clinical practice and future research protocols.

No. 133 The Effects of a Static Contraction of Pelvic Posterior Depressors on the Brain Activities Induced By an fMRI in Normal Volunteers.
Shiratani Tomoko; Arai Mitsuo; Kuruma Hironobu; Yanagisawa Ken.

Object: To test hypotheses that direction-dependent brain activation and/ or change of regional brain activation would occur during a resisted sustained contraction of pelvic posterior depressors (SCPd) technique using proprioceptive neuromuscular facilitation (PNF) pattern while lying on the side. Design: Randomized block design. Setting: Functional magnetic resonance imaging (fMRI) which reﬂects primarily the synaptic activities of cortical neurons was used to determine regional brain activities occurring during SCPD technique compared with a resisted sustained contraction for pelvic depressors (SCPd) technique while lying on the left side. Participants: Eighteen right-handed subjects (male 9 female 9 age range 21-25) were asked to exercise in fMRI. Main Outcome Measures: The region of interest (ROI) was identiﬁed based on the group random effect analysis corresponding to bilateral sensorimotor areas (SMA), supplementary motor area (SMA), basal ganglia (BG), thalamus, brainstem, cerebellum and insula in order to compare the percentage signal change during SCPD or SCPd technique. Three factor analyses of variance (ANOVA) were used to determine the differences between the lateralization (right left), technique (SCPd technique SCPd technique) and ROI on the effect of the percentage signal change. The level of statistical signiﬁcance was set at p<0.05. Results: The interaction and lateralization main effect were not signiﬁcant. However both the technique and ROI main effects were signiﬁcant. SCPD technique showed a signiﬁcant larger percentage signal change compared with SCPD technique. SMA activation showed a signiﬁcant larger percentage signal change compared with insula, and insula also showed a signiﬁcant larger percentage signal change compared with BG. Conclusions: There was no signiﬁcant hemispheric lateralization of brain activations but fMRI signals were signiﬁcantly stronger during SCPD technique which indicate that more synaptic activities of cortical neurons
No. 134 The Proper Choice of Arm Sling for Hemiplegic and Hemiparetic Patients.
Yu Ri Son, MD; Min Ho Chun, MD; Sook Joung Lee; Jin Hwa Yi.

There has been no proper indication of arm sling for stroke patients. This study was designed to determine the proper arm sling for stroke patients according to the motor recovery state by comparing the differences in the effectiveness and satisfaction between Kenny-Howard (KH) type and extension (EXT) type sling. Hemiparetic and hemiplegic stroke patients who were within 3 months from stroke onset were enrolled in this study. We excluded the patients who had a history of shoulder trauma or chronic stroke. We compared KH type sling and EXT type sling in hemiparetic patients group. Also we compared these slings in hemiparetic patients group. The vertical distance (VD), horizontal distance (HD), and joint distance (JD) of the shoulders on the plane AP views were measured initially and 3 weeks after. Twenty four hemiplegic patients and twenty one hemiparetic patients were included in this study. There were no significant differences between the groups on baseline evaluation in hemiplegic group. The results were same in hemiparetic group. After the treatment all patients showed improvement in VD, HD and JD. There were no significant differences of upper limb tone between hemiplegic and hemiparetic patients after 3 weeks. When the treatment effects were compared between the groups in hemiplegic patients changes of VD significant improved in patients wearing KH type sling. There were no significant differences among changes of VD, HD and JD in hemiparetic group when KH or EXT type slings were applied.

No. 135 The Influence of Patient’s Weight on Stroke Rehabilitation Outcome.
Iuly Treger, MD PhD MHA; Leonid Kalichman, PT PhD; Deborah Alperovitch-Najanson.

Disclosure: None. Objective: To check hypothesis that overweight can influence the stroke functional outcome and that rehabilitation is less effective in overweight and obese patients compared to normal weight patients in terms of functional independence measure (FIM) improvement in first-event stroke patients. Design: Retrospective comparative study. Setting: Inpatient rehabilitation facility. Participants: 102 first-time stroke male and female patients admitted to the 52-bed acute neurology rehabilitation department in a rehabilitation hospital were included in the study. Intervention: Body mass index (BMI) and FIM were fixed. Statistical tests were performed to find out the correlation between parameters. Main Outcome Measures: BMI, FIM on admission and at discharge, as well as the delta-FIM (FIM on admission – FIM at discharge) were evaluated. Results: A statistically significant negative correlation (r = 0.27 p = 0.014) was found between FIM change and BMI. Conclusions: Acute post stroke patients’ rehabilitation effectiveness is negatively associated with the patients’ BMI in terms of improvement of functional parameters according to FIM measurements. Patients’ weight should be taken into consideration when predicting rehabilitation outcome for stroke patients. Further investigations are needed to identify the functional parameters affected by the patients’ weight. New rehabilitation strategies should be designed to improve functional outcomes of rehabilitation in obese patients.

No. 136 Impact of Home-Based Exercises on Function and Walking Ability of Stroke Patients.
Iuly Treger, MD PhD MHA; Leonid Kalichman, PT PhD.

Disclosure: None. Objective: To evaluate the effect of post rehabilitation home-based exercises program on walking ability and function of post-stroke patients upon returning home. Design: Single-blinded randomized controlled trial. Setting: Inpatient rehabilitation facility. Participants: Ninety-eight ischemic stroke patients were randomly assigned to an intervention or control group. Intervention: During the last part of hospitalization subjects in the intervention group received a list with detailed program of 14 exercises and were instructed to walk at least 30 minutes daily. Physical therapists ensured that subjects understood the exercises and were able to perform them independently according to the list. To monitor the execution of the exercises each subject in the intervention group received a diary in which the number of exercises performed and amount of time spent walking were daily recorded and a phone call every two weeks encouraging the continuation of home-based training. Subjects in the control group received only standard discharge forms and only one phone call with a reminder of the follow-up visit. Main Outcome Measures: The ten meter walk test (10MWT), six minute walk test (6MWT), and timed up & go (TUG) were performed twice at the end of the inpatient rehabilitation period and three months later (E1 and E2) by a researcher blinded to patients’ allocation. Results: No significant difference was found in the control group as to any studied parameter between E1 and E2. A significant improvement was shown in the intervention group as to time parameter of the 10MWT (p = 0.008), 6MWT (p < 0.001), and TUG (p = 0.009). When comparing delta values (E2-E1) for each test we found that only 6MWT significantly differed between the two groups and no difference was found in the 10MWT and TUG. Conclusions: Home-based exercises significantly improved the 6MWT results in post-stroke patients. We recommend integrating home-based exercises into the standard post-hospitalization stroke rehabilitation.

No. 137 Functional Outcome of Ischemic and Hemorrhagic Stroke Patients After Inpatient Rehabilitation.
Maria Vazquez Guimaraens; Belen Maside Oliete; Veronica Rodriguez Lopez; Carmen Crespo Lopez.

Objectives: To quantify recovery after rehabilitation therapy and to identify factors that predicted functional outcome in survivors of intracerebral hemorrhage (ICH) compared with cerebral infarction. Design: Retrospective study of consecutive stroke admissions to a rehabilitation hospital over a 2-year period. Setting: Rehabilitation unit. Participants: We retrospectively identified all persons with a diagnosis of stroke who were consecutively admitted to Hospital Maritimo de Ota (A Coruña, Spain) between January 1, 2012, and December 31, 2013. A total of 156 cases met the inclusion criteria (56 women, 100 men; 102 with cerebral infarction, 54 with ICH; 133 supratentorial lesion; 48.7 % left laterality). Interventions: Not applicable. Main Outcome Measures: Functional status was measured using the Functional Independence Measure (FIM motor, FIM cognitive, and FIM total score) recorded at admission and discharge. Recovery was quantified by the rate of FIM change with time and the main outcome measures were total discharge FIM (motor, cognitive and total score). Univariate and multivariate analyses were performed. Level of Evidence: Level 2 (mid-level). Results: Admission FIM cognitive was higher in patients with cerebral infarction than in patients with ICH (20 vs 16 p = 0.014). Discharge FIM cognitive score was higher in patients with cerebral infarction than in patients with ICH (26 vs 22 p = 0.007). The patients with ICH had longer rehabilitation length of stay (LOS) than in patients with cerebral infarction (94 vs 76 p = 0.043). No difference in discharge FIM motor and FIM total score were present. On multivariate analysis, admission FIM motor, admission FIM cognitive, supratentorial lesion, and LOS independently predicted total discharge FIM. Admission FIM motor, supratentorial lesion, and LOS independently predicted the rate of FIM change with time. Conclusions: The patients with ICH had greater functional impairment than the cerebral infarction patients at admission and discharge. Initial
severity of disability, localization of lesion and LOS predicted functional outcome after rehabilitation.

No. 138 Functional Imaging Study Comparing Movement Mirroring With Movement Observation in Both Hands in an Otherwise Identical Setting.
Jing Wang; Dohele Christian; Mauritz Karl Heinze; Fritsch Claire.

Objective: To compare lateralized cerebral activations elicited during self-initiated movement mirroring and observation of movements. Design: Functional imaging study comparing movement mirroring with movement observation in both hands in an otherwise identical setting. Imaging data were analysed using statistical parametric mapping software with significance threshold set at p<0.01 (false discovery rate) and a minimum cluster size of 20 voxels. Setting: MRI department. Participants: A total of 15 right-handed healthy subjects age range 22-56 years. Intervention: Not applicable. Main Outcome Measures: Cerebral activation during movement mirroring and movement observation. Level of Evidence: level 1. Results: Movement mirroring induced additional activation in primary and higher-order visual areas strictly contralateral to the limb seen by the subject. There was no significant difference of brain activity when comparing movement observation of somebody else's right hand with left hand. Conclusion: Lateralized cerebral activations are elicited by inversion of visual feedback (movement mirroring) but not by movement observation.

No. 139 Full-Movement Neuromuscular Electrical Stimulation Can Reduce Plantar Flexors Spasticity and Increase Ankle Joint Movement But Can't Improve Gait Function in Stroke Patients.
Yonghui Wang; Fei Meng; Yang Zhang; Shouwei Yue.

Disclosure: None. Objective: To investigate whether full-movement neuromuscular electrical stimulation (F-NMES), which could generate full range movement when applied to motor point (MP) in subacute stroke patients, decreases spasticity and/or improves motor function more effectively than control sensory threshold-NMES (S-NMES) and motor threshold-NMES (M-NMES) stimulation. Design: A randomized blinded controlled study. Setting: Physical therapy room and functional assessment room. Participants: 72 adult patients with subacute post-stroke hemiplegia and spasticity were included in the study as subjects. Interventions: Patients received 30-minute sessions of NMES on MP of extensor digitorum longus twice a day for 5 days a week. The stimulation intensity of NMES was adjusted in terms of different requirements in 4 groups: control S-NMES, M-NMES and F-NMES. Main Outcome Measures: Composite spasticity scale (CSS), the scale of ankle joint motion function (AJMF) and the gait velocity by the timed up and go test (TUGT) were assessed at the times of before treatment, 4 weeks of treatment, and 2 weeks follow up. Level of Evidence: Level 1. Results: After 4 weeks of treatment when compared difference of pre-treatment and post-treatment with interclass only F-NMES group produced greater reduction percentage in CSS and the greater improvement in AJMF. Furthermore these improvements can be maintained 2 weeks after treatment ended. However after 4 weeks of treatment there was no significant difference in the percentage of increase in gait velocities by TUGT among 4 groups although in F-NMES group there had an obvious increased compared with pre-treatment. Conclusions: F-NMES with stimulus intensity generating full movement can significantly decrease plantar flexor spasticity and increase ankle joint movement but can't improve gait function in subacute stroke patients. This work was supported by the NNSF of China (grant no. 81000855 and 81272155) and the NSF of Shandong (grant no. Zr2010hg021).

No. 145 The Effects of Biodex System Assisted By Task-Specific Walking Training on Motor Function of Lower Limbs After Stroke.
Quya-Ping; Song Wei-Gun.

Objective: To explore the effects of Biodex system assisted by task-specific walking training on motor function of lower limbs after stroke. Methods: Selection method of balance and lower limb movement dysfunction after stroke patients with hemiplegia: 40 cases with random number table method are divided into the experimental group and control group: 20 patients in each group. The control group used conventional rehabilitation treatment and the experimental group had routine rehabilitation treatment application with Biodex training system auxiliary task-specific walking training. Two groups of before and after treatment, respectively, for stability index, BBS, TUGT, main step speed, stride length, FMA, MBI, FAC for patients with balance and lower limb motor function were assessed. Results: Before treatment, the difference in indicators between the two groups was not statistically significant (p> 0.05); after treatment BBS from 22.42 ± 4.13 increased to 49.37 ± 3.96; step from 30.31 ± 11.10 increased to 53.70 ± 12.13; FMA from 15.43 ± 5.71 increased to 30.50 ± 4.25; MBI from 56.78 ± 10.32 up to 80.87 ± 13.75. Experimental Group (p < 0.05) than before treatment was statistically significant between groups (p < 0.01) were significant. Conclusion: Biodex system assisted by task-specific walking training has a good effect on balance and lower limb motor function after stroke.

No. 146 A Comparison Regarding ADL Recovery Between Percutaneous Endoscopic Gastrostomy and Nasogastric Tube Feeding in Patients With Dysphagic Stroke in a Convalescent Rehabilitation Ward.
Ikenaga Yasunori; Nakayama Sayaka; Taniguchi Hiroti; Nahoko Komatsu.

Objective: To compare percutaneous endoscopic gastrostomy (PEG) with nasogastric tube feeding (NGT) after dysphagic stroke in terms of ADL recovery. Design: Retrospective cohort study. Setting: A convalescent rehabilitation ward. Participants: A total of 67 patients with PEG or NGT from November 1, 2008, to October 31, 2013, were included. All patients were diagnosed with stroke in an acute-care hospital and went to the convalescent rehabilitation ward within two months. Patients were divided into the PEG group (n=29) and NGT (n=42) group. Two groups were compared to existing demographic data, GCS, swallowing severity, NIHSS, FIM instrument scores on admission. Length of hospital stay, training time, FIM efficiency, and the rate of complete oral intake were compared between the two groups. Logistic regression analysis and multiple regression analysis were used to show the factors for complete oral intake and FIM gains during hospital stay. Ethical committee in the hospital approved this study. Interventions: Not applicable. Main Outcome Measures: FIM instrument scores, dysphagia severity scale (DSS), functional oral intake scale (FOIS), length of hospital stay, FIM efficiency score, and the rate of complete oral intake. Results: Demographic data were similar between the two groups. No significant differences were found in GCS, NIHSS, DSS-FOIS and FIM instrument scores on admission. No significant differences were found in length of hospital stay and training time. Significant differences were found as follows: the rate of complete oral intake (PEG: 20% vs. NGT: 64.3%; p<0.01), FIM efficiency (PEG: 0.093±0.13 vs. NGT: 0.194±0.28 p=0.17). Logistic regression analysis showed that cognitive FIM scores, DSS, and the method of tube feeding (PEG or NGT) contributed to the higher recovery rate of complete oral intake (hr: 1.23 95% CI: 1.07-1.38 hr: 4.56 95% CI: 1.51-13.79 and hr: 12.3 95% CI: 2.27-66.76, respectively). Multiple regression analysis indicated that GCS and the method of tube feeding contributed to FIM gains during hospitalization (p<0.01 and p=0.04, respectively).
No. 148 The Effectiveness of Aquatic Exercise Program on Bone Mineral Density and Physical Function in Postmenopausal Women With Osteoporosis: A Randomized Controlled Trial.

Nerimane Abazi; Ardiana Murtezani; Zana Ibraimi; Arian Nevzati.

Disclosure: None. Objective: Osteoporosis is a multifactorial progressive skeletal disorder characterized by reduced bone mass, a predisposition to increased fracture risk, and represents a serious and global public health problem. Exercise is widely recommended to reduce osteoporosis falls and related fragility fractures. The purpose of this study was to investigate the effects of land exercise (LE) and aquatic exercise (AE) on physical function and bone mineral density (BMD). Design: A randomized controlled trial. Setting: The Physical Medicine and Rehabilitation Outpatient Clinic in the University Clinical Center in Kosovo. Participants: Fifty-eight postmenopausal women aged 50-70 years diagnosed with osteoporosis according to BMD measures enrolled in this study. The subjects were randomly assigned to either the intervention group (LE group) or the control group (AE group). Main Outcome Measures: Physical function and BMD were assessed in all subjects in both groups before and after 12 months of intervention. The muscle strength, flexibility, balance, gait time, and pain were measured to assess physical function. Bone mineral density at the lumbar spine was measured by dual energy x-ray absorptiometry (DEXA). Results: There were no significant differences between the two groups in the baseline anthropometric data. The two groups were similar with respect to age, weight, height, and body mass index (p>0.05). After the exercise program muscle strength, flexibility, gait time, pain, and bone density (p<0.001) significantly improved with LE compared to AE. There was no significant difference between the two groups in balance at the 12-month follow-up. Conclusion: Although both LE and AE have beneficial effects on physical function and BMD in osteoporotic women LE seems to be more effective. These results support the benefits of LE in the clinical management of patients with osteoporosis but need to be confirmed in a larger sample.

Conclusions: Conditions as pain medication, lack of energy, among others limit the patients in some way to carry out their activities on a daily basis.

No. 149 The Effectiveness of Aquatic Exercise Program on Bone Mineral Density and Physical Function in Postmenopausal Women With Osteoporosis: A Randomized Controlled Trial.

Diana Avendaño-Badillo; Susana Galicia-Amor, MD; Verónica M. López-Roldán, Ríta Velázquez-Lema, MD.

Disclosure: None. Objective: To obtain an instrument under international trends for the identification and measurement of people with disability in medical units of health sector in order to establish an administrative record that provides relevant information for planning and management of public policies in favor of people with disabilities (PD). Setting: Rehabilitation units. Interventions: Not applicable. A team of health institution information offices and civic associations related to PD drafted a charter for generating information on PD including social, demographic, and health information and functioning based on the International Classification of Functioning, Disability and Health (ICF). A pilot study was conducted to verify the instrument which was applied after training 85 medical rehabilitation specialists in health institutions. Results: We analyzed 1030 documents where 51% of the population was male, the mean population age was 37 years, 68% lived in Mexico City, had no partner 64%, 38% no had social security. Most of the population expressed low and middle, 73% express not employed but reported the diagnosis corresponds to cerebral palsy and other paralytic syndromes. Major activities reported a serious condition in full were: use of means of transport (34%), walking (31.4%), and move in the environment (29.7%). The main barriers expressed by age groups were: attitudes of strangers (44.5%), mountains, hills, valleys and plateaus (28.1%), and products and technology for mobility and personal transportation in closed and open (33.6%). Conclusions: We need to design a format for childhood and youth 0-17 years old and apply the registration to people living in rural areas as well as people with impairments of the senses of sight, hearing, and speaking.

No. 151 Information of People With Disabilities: An Interagency Effort In Mexico.

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Aydemir Koray; Yavuz Ferdi; Güzelkucuk Umit; Tan Arif Kenan.

Disclosure: None. Setting: Secondary level hospital. Patient: A 60-year-old woman with polymyalgia rheumatica. Case Description: The patient was referred to outpatient clinic of neurology with the complaint of severe cervical pain and headache which had been lasting for 4 weeks. Cervical x-ray and brain CT were performed. Brain CT was normal and cervical x-ray showed characteristic features of cervical spondylodiscitis. NSAID was prescribed to the patient. Due to the fact that her symptoms did not resolve with NSAID use, she was referred to outpatient clinic of neurosurgery. Cervical MRI was performed and revealed spinal stenosis at C5-C6 intervertebral disc level. Her neurologic examination was normal. The patient was referred to outpatient clinic of medical medicine and rehabilitation. 15 sessions of physical therapy were given to the patient. However her complaint did not resolve with physical therapy. Because of deciding to admit to different hospital the patient was admitted to our hospital's outpatient clinic of physical medicine and rehabilitation. As we questioned the patient carefully, persistent pain and stiffness affecting both shoulder and pelvic girdles were detected. Morning stiffness was lasting more than an hour. Erythrocyte sedimentation rate (ESR) was 60 mm/hr. Other laboratory findings were normal. Based on these findings, high clinical suspicion of polymyalgia rheumatica (PMR) was thought. Low-dose prednisolone (10 mg/day) was begun to the patient. Prednisolone led to significant clinical improvement after the 4th day of the treatment. ESR was 25 mm/hr at the


Russell Arcila Novelo; Armando López Manrique, MD; Damaris Estrella Castillo.

Objective: To identify the quality of life perception for people with physical disabilities. Design: Descriptive survey. Setting: Basic rehabilitation units at Yucatan. Participants involving 400 patients Between 41 and 60 years old. Interventions: We used the WHOQOL-BREF (World Health Organization Quality of Life BREF) scale composed of 4 areas: physical, psychological, social relationships and environment. We identified 26 types of neurological and musculoskeletal disorders. Main Outcome Measures: Perceived quality of life. Level of Evidence: 1. Results: We obtained an average of 89.87 points (between 51 and 121) with a standard deviation of 11.59, meaning that patients perceive good quality of life despite the physical disability they have. The psychological aspect had the highest score. Participants were very satisfied with the meaning of life, enjoy it, and are satisfied with themselves. The lowest domain was physical health showing differences between the most common conditions of tendinitis, cerebral palsy, facial paralysis, bone fracture, post-surgery arthritis, back pain, fracture and amputation sequela.
10th day of the treatment. The patient had continued prednisolone treat-
ment for 6 months.

No. 153 Coexistence of Ankylosing Spondylitis and Behcet’s Disease: A Case Report.
Koray Aydemir; Ferdi Yavuz, MD; Umut Guzelkucuk; Mehmet Ali Taskaynatan (Elimesgut Military Hospital, Ankara, Turkey).

Disclosure: None Setting: Secondary level hospital. Patient: A 25-year-old man with Behcet’s disease. Case Description: The patient was referred to our outpatient clinic of PMR with the complaint of severe low back pain and gluteal pain which had inflammatory characteristics in nature. He had had this complaint for 2 years and until the last 6 months his low back pain didn’t affect his life poorly. Morning stiffness was lasting more than an hour. As we questioned the medical history of the patient, we learned that he had been receiving colchicine drug with a diagnosis of Behcet’s disease for 4 years. His physical examination revealed restriction of the lumbar spine in sagittal and coronal planes. Fabere-Patrick test was bilaterally positive. Laboratory evaluation was within normal limits. The tissue typing was positive for HLA-B27 and HLA-B5. He had bilateral grade 2 sacroiliitis on MRI. Based on clinical laboratory and radiological findings the patient was diagnosed with ankylosing spondylitis. Discussion: We aimed to present a patient with Behcet’s disease who was diagnosed currently with an ankylosing spondylitis. Sacroilitis can be determined rarely in Behcet’s disease. However Behcet’s disease is not included in spondyloarthritis diseases. Conclusion: As patients with Behcet’s disease are referred to outpatient clinic with new onset complaint of low back pain and gluteal pain which have an inflammatory characteristics in nature, differential diagnosis should be made carefully between coexistence of spondyloarthritias and sacroiliac joint involvement of Behcet’s disease. Reprinted with permission.

No. 154 Postpartum Septic Sacroilitis: A Case Report.
Koray Aydemir; Ferdi Yavuz, MD; Ismail Dede; Mehmet Ali Taskaynatan (Elimesgut Military Hospital, Ankara, Turkey).

Disclosure: None Setting: Secondary level hospital. Patient: A 32-year-old woman with postpartum sacroilitis. Case Description: The patient gave birth to her first child through vaginal delivery without any complication. At postpartum one month, low back pain and right buttock pain had begun. Her complaints were worsening at night. Because of restricted ambulation the patient was admitted to our department in a wheelchair. On admission she had tenderness in the right sacroiliac joint and her right hip movement was restricted due to severe pain. The femoral and sciatica nerve stretch tests were negative. There was not any neurologic deficit. She had a body temperature of 37.8 °C, a total white cell count of 16,700/mm³, a C-reactive protein level of 45 mg/dl (normal range: 0-5), and an erythrocyte sedimentation rate of 83 mm/h. Brucella agglutination tests (Rose-Bengal and Wright) were positive. Sacroilitic magnetic resonance imaging examination was consistent with right sacroilitis. The patient was consulted to the infectious diseases clinic and antibiotic treatment was started. At the second week of the treatment marked improvements in clinical and laboratory findings were noted. Discussion: We aimed to present a patient with postpartum pyogenic sacroilitis which occurs infrequently. Low awareness of the clinical picture and inadequate physical examination usually lead to delay in diagnosis. Optimum treatment consists of long-term weights (WB) capacity were collected and analyzed before the training.

Main Outcome Measures: The gait temporal–spatial parameters and the weight bearing (WB) capacity were collected and analyzed before the walking training in the 1st day, after the training in the 5th day, and the 10th day. Results: Compared with pre-training the WB of entirefoot, hindfoot, forefoot (p<0.01) and the bilateral step length, effected step time, bilateral support time (p<0.05) after 5 and 10 days training in the both groups shown all statistical advantage. There were significantly better (p<0.01) in the WB of entirefoot, hindfoot, forefoot and statistical advantage (p<0.05) in the effected step length, effected stride length, effected support time, velocity for 5 days training in the feedback group than the conventional group. And compared with the 5th day results, the WB of entirefoot, forefoot, and the effected step length, healthy swing time, effected support time after 10 days training have been improved (p<0.05) in the feedback group than the conventional group. Conclusions: FFT can increase the WB of lower limb prostheses, improve the gait, and shorten the training time. Reprinted with permission.

No. 157 Age But Not Sit or Stance Affects Rapid Reaching Movement Time to Virtual Objects in Response to a Simple or Go/No-Go Task.
Riki Brown; Arie Burstin; Yocheved Laufer.

Objectives: The objectives of the present study were to investigate the reliability and usability of a virtual reality (VR) environment specifically using a simple and a go/no-go task for upper extremity movement - time paradigm. The study was designed to determine: 1. Test retest reliability; 2.
Role of a Foreign Non-Profit Rehabilitation Association in a Large-Scale Natural Disaster: The Papa Experience in Typhoon Haiyan a Program Report.

Rochelle Dynd; Ernesto Cruz, MD; Filipinas Ganchoon; Charles De Mesa, DO.

Setting: Tent city for displaced persons and a rural community in the typhoon-affected area. Program: A relief/medical mission co-sponsored by the Philippine American Physiatrist Association (PAPA). Program Description: PAPA, a small group of US-based physiatrists of Filipino heritage/descent partnered with the Philippine Academy of Rehabilitation Medicine (PARM) a national rehabilitation society in conducting a relief and medical mission to a tent city in San Jose Tacloban and the rural community of Burauen, Leyte, Philippines three months after typhoon Haiyan February 17-18, 2014. The group comprised of 8 physiatrists.

Assessments: Thesis: 120 and 300 hygiene kits were distributed at San Jose and Burauen, respectively. A basic need/medical screening survey was administered which identified basic needs as well as medical conditions including disabilities. Free medical-rehabilitation consultations with limited medications were provided to residents in Burauen. Nearly half (46%) of the 283 patients served were pediatrics and 94 were males. Infections were diagnosed in 17 cases and belonged to different universities (public and private).

Conclusions: The study of VR environment demonstrates moderate to high test retest reliability. Older adults respond more slowly particularly when faced with a go/no-go reaction. The need to maintain upward posture while maintaining a comfortable stance position does not challenge the older subjects sufficiently to effect movement time during stance.

Randomized Controlled Trial: Decreased Pain and Improved Functionality By Using Intraarticular Injection of Botulinum Toxin Type A Vs Intraarticular Injection With Methylprednisolone in Knee Osteoarthritis.

Ethel Fluchaire; María Del Carmen Moro.

Objective: To prove that knee intraarticular injection with botulinum toxin type A (TBA) in patients with knee osteoarthritis (KOA) is more effective than those with knee intraarticular injection with methylpredni- solone (MP) for decreased pain and improvement in functionality.

Design: Prospective randomized controlled study. Setting: Rehabilitation center. Third attention level. Participants: 35 subjects randomly assigned to TBA (n=17) or MP (n=18) groups; with a total of 53 knees TBA group (n=22) and MP group (n=31). Intervention: Intraarticular injection was performed in symptomatic knees of patients with KOA with subsequent follow-up in 1, 2, 3, and 6 months after application. Descriptive statistical analysis was made by using t Student and linear regression analysis. Main Outcome Measures: Visual analog scale (VAS) for pain intensity, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) for functionality. Level of Evidence: 2 Results: A significant difference with a p value =0.01 was found for TBA group in decreased pain (VAS) and improvement in functionality (WOMAC) in the categories of pain and function. With a longer duration of therapeutic effect in the group of TBA. Conclusions: The use of the intraarticular injection of botulinum toxin type A provides more effective therapeutic option for pain reduction and improved function in patients with knee osteoarthrosis with a longer duration of effect compared with the use of methylprednisolone.


Esquivia Carmen C., MD (Hospital Militar Central Bogotá, D.C., Colombia); Pira Jo; Esquivia Pajaro Carmen; Pira Paredes Jose.


Case Description: The initial management performed was osteosynthesis on the scaphoid bone and a pelvic graft of the nonunion focus. The procedure was described as unremarkable. However in subsequent outpatient controls after two months patient reported persistent pain. Radiographic examination showed an altered consolidation. After which he was referred to our service. In our perspective patient had preserved muscle strength in both upper limbs. Sensitivity was preserved without signs of active synovitis levels in the right carpal region. Patient is then considered a candidate for shock wave therapy. The patient received 5 sessions of shock waves at a frequency of 14 beats per second with an intensity of 2 air pressure at 5 bar for a total of 6000 shots. Assessment/Results: After 5 sessions a new x-ray is taken where improvement was evident in consolidation level. The nonunion of the left hand also had a decrease of 4 points on the subjective pain scale. Physical examination did not indicate a decrease in range of motion. Finally there was an improvement indicator on the score of quick functional scale. Discussion: Treatment with extracorporeal shock waves has proven effective to accelerate bone healing. However to our knowledge this is one of the first reported cases of improved results with shock wave therapy. Conclusion: Scaphoid pseudarthrosis refers to the failure to consolidate a fracture at a navicular bone level. Several types of treatments have been used to improve this union alteration one being extracorporeal shockwave therapy as described in this case presentation which showed excellent results.

Determine Metabolic Health Status in Adults: An Observational Study.

Katherine González-Ruíz; Robinson Ramírez-Vélez; Jorge Enrique Correa-Bautista.

Disclosure: None. Objective: The influence of sugar-sweetened beverages (SSBs) on metabolic health and body fatness has been extensively researched and debated in the last few years. However this association has not been reported in Latin-American population. The aim was to examine the relationships between the consumption of SSBs and metabolic health definitions in adults. Setting: All subjects were from Bogota (Colombia) and belong to different universities (public and private). Participants: A total of 280 healthy men and women (age 23.3±2.3 years; weight 61.2±11.3 kg; BMI 22.5±3.6 kg·m⁻²) were invited to participate in the
study. **Main Outcome Measures:** Metabolic health status was defined using 9 metabolic health definitions based on a range of cardiometabolic abnormalities (total cholesterol, triglycerides, C-HDL, C-LDL, glucose, waist circumference, body adiposity index, body mass index, and waist size index). SSb consumption was measured with a previously validated brief questionnaire to assess habitual beverage intake (beqv-15). The relationship between the frequency of consuming SSbs and metabolic health was determined after controlling for age, sex, and other confounders by using multiple regression techniques. **Results:** Independent of other factors high consumption of SSbs (2 and 4 servings/day) vs. (non-consumers) showed higher values in total cholesterol (151 ± 29 vs. 144 ± 32 mg/dl), triglycerides (80 ± 50 vs. 80 ± 44 mg/dl), glucose (87 ± 9 vs. 83 ± 10 mg/dl), C-LDL (92 ± 8 vs. 83 ± 6 mg/dl), and in waist circumference (77 ± 9 vs. 75 ± 7 cm); p for trend <0.05. Besides an inverse relationship was observed between high consumption of SSbs and low levels of C-HDL (41 ± 11 vs. 44 ± 12 mg/dl p<0.05).

**Conclusions:** In this cross-sectional analysis it is observed that consumers of SSbs were more likely to display metabolic abnormalities compared to non-consumers.

**No. 167 Renovation of Rehabilitation Hospital for Home Return.**

Yasuko Hashimoto.

**Disclosure:** None. **Introduction:** Our hospital is the rehabilitation hospital devoting to the rehabilitation of patients with various neurological or orthopedic and other medical conditions following stabilization of their acute medical issues. The goal for our hospital is to improve the activities of daily living (ADL) of the inpatients aiming for home return.

**Objective:** To test hypotheses that the home return rate of inpatients increased by renovated hospital in the style similar to the Japanese style from Western style. **Setting:** Rehabilitation hospital Japan.

**Participants:** All inpatients in rehabilitation hospital on recovery stage in 2013. **Interventions:** Our hospital has two type of rooms: general Western type of rooms and rooms renovated in the style similar to the Japanese style at home from Western style. The living rooms were also reformed from multiple-bed rooms to the private rooms. **Main Outcome Measures:** We examined the home return rate and FIM of the inpatient to compare with before and after the reform of the hospital.

**Results:** The secondary outcomes were the amount of activity in a multiple-beds room and the private room. **Level of Evidence:** Level 2 evidence.

**Results:** Home return rate and FIM improved in comparison with before and after the reform of the hospital. The amount of activity e.g. area of activity and steps per day significantly increased in the private room compared with in a multiple-bed room.

**Conclusions:** We concluded that considering environment for rehabilitation was important to improve ADL and to return to home.

**No. 169 Comprehensive Rehabilitation Improved Taste Sensitivity in Patients With Overweight and Obesity.**

Kumiko Itō, Msc; Satoru Ebihara, MD PhD; Tamao Takahashi; Masahiro Kohzuki.

**Disclosure:** None. **Objective:** Obese patients have lower taste sensitivity than normal-weight controls. Comprehensive rehabilitation reduced weight and increased exercise tolerance in obese patients. However effects of comprehensive rehabilitation on taste sensitivity are still unknown. Therefore this study determined whether comprehensive rehabilitation improved taste sensitivity in obese patients.

**Design:** Single-group intervention trial.

**Setting:** Comprehensive rehabilitation. **Patients:** Forty-one patients diagnosed as overweight (Body mass index; BMI > 25 kg/m^2) or obesity (BMI > 30 kg/m^2) and hospitalized for weight loss and treatment of complications.

**Interventions:** Subjects participated in comprehensive rehabilitation program including exercise therapy, diet therapy, and self-monitoring of weight and behavior and patients’ education for 4 weeks.

**Main Outcome Measures:** BMI, body composition (fat mass index; FMI and fat free mass index; FFMI), exercise tolerance (6-minute walking distance; 6MWD), and 5 taste sensitivity (salt, sweet, bitter, sour, and umami) measured by the filter-paper disc method.

**Results:** The 4-week program significantly decreased BMI from 39.4 ± 11.8 to 34.8 ± 8.8 kg/m^2 (p <0.01) and FMI from 17.6 ± 10.8 to 15.2 ± 9.3 % (p <0.01) although there was no significant change in FFMI. The program significantly increased 6MWD from 176 ± 133.6 to 297.8 ± 185.1 m (p <0.01). Additionally all the 5 taste sensitivity significantly improved after the program (salt: 2.7 ± 1.0 to 2.1 ± 0.8 units, sweet: 2.7 ± 1.0 to 2.1 ± 0.8 units, bitter: 3.0 ± 0.8 to 2.2 ± 1.1 units, sour: 4.1 ± 0.1 to 3.0 ± 0.1 units, umami: 2.8 ± 0.1 to 2.1 ± 1.1 units) (p <0.01 for each taste).

**Level of Evidence:** Level 1.

**Conclusions:** The present study revealed that the comprehensive rehabilitation improved not only body composition and exercise tolerance but also taste sensitivity in overweight and obese patients.

**No. 170 Effectiveness of Comprehensive Rehabilitation in Patients With Non-Alcoholic Fatty Liver Disease.**

Osamu Itō; Yoshiko Sakata, MD; Nobuyoshi Mori; Masahiro Kohzuki.

**Disclosure:** None. **Objective:** Non-alcoholic fatty liver disease (NAFLD) is a phenotype of metabolic syndrome. Paralleling the increasing prevalence of obesity NAFLD is becoming common and potentially serious all over the world. There are few reports of effective therapeutic intervention for NAFLD. Thus, we examined effects of comprehensive rehabilitation in patients with NAFLD.

**Design:** Hospitalized comprehensive rehabilitation subjects: seven adults (age 41 ± 16.7 years/male/female 3/4) who were diagnosed NAFLD and resistant to regular outpatient treatment. **Intervention:** They were admitted to Tohoku University Hospital and underwent exercise therapy with a bicycle ergometer and an underwater treadmill and diet therapy of 25 kcal/day/kg standard body weight (1600-1200 kcal/day). After a guidance of life style modification they were discharged and followed at home for 6 months.

**Level of Evidence:** Level 1.

**Results:** On admission the body mass index (BMI) was 38.7 ± 9.2 kg/m^2. Serum aspartate transaminase (AST) and alanine transaminase (ALT) were 98 ± 48 IU/L and 143 ± 90 IU/L. High triglyceride, high low-density lipoprotein cholesterol, and low high-density lipoprotein cholesterol in serum were shown in 5, 5, and 4 cases, respectively. Diabetes mellitus and hypertension were shown in 5 and 5 cases. After 6 months, the BMI significantly decreased to 34.7 ± 8.8 kg/m^2 (p <0.01) and serum AST and ALT decreased to 31 ± 23 IU/L and 49 ± 47 IU/L (p <0.01).

**Conclusion:** The clinical course of these cases indicates that the hospitalized comprehensive rehabilitation is an effective treatment in patients with NAFLD.

**No. 171 The Treatment of Shoulder Pain After Stroke.**

Nur Kesiktas; Aysegul Ketenci; Dilsad Sindel; Melek Özarslan.

**Objectives:** A common sequela of stroke is hemiplegic shoulder pain that can effect functional recovery and lead to disability. Some of the most frequently suspected factors contributing to shoulder pain include subluxation, contractions, complex regional pain syndrome (CRPS), rotator cuff injury, and spastic muscle imbalance of the glenohumeral joint.

**Methods:** We aimed to investigate the incidence and the type of shoulder pain and the relationship between demographics, clinical, and therapy. Of 100 consecutive hemiplegic patients who were examined, 62 had shoulder pain. Computer generated random numbers were applied for the treatment of pain with gabapentin 800mg (2 times 400mg in a day) or paracetamol 1500mg (3 times 500 mg in a day). Patients’ measurements were recorded at the beginning and at the second week of the therapy after a month. Range of shoulder external rotation, shoulder pain (VAS), Barthel index, Brunstrom grading for upper extremity, modified Ashworth scale. After a month gabapentin was given instead of non-steroid antiinflammatory. Both groups were evaluated at the end of second month. **Results:** Both therapies had some improvements. Especially gabapentin had the most significant results on shoulder pain VAS (p <0.01) at the first month. And at the end of second month gabapentin was successful instead of 1500 mg paracetamol.

**Conclusion:** Shoulder
pain is an important and common problem for stroke patients. Neuropathic origin is common in etiology. Even low dose gabapentin was effective in our study and well tolerated.

No. 173 Is Vestibular Rehabilitation as Effective in Bilateral Vestibular Dysfunction as in Unilateral Vestibular Dysfunction?

Yasemin Kirazli; Hale Karapola; Nese Celebiyos; Tayfun Kirazli.

Background: Bilateral vestibular dysfunction causes serious disabilities and handicaps. Patients with bilateral dysfunction often restrict their activities and tend to be unsocial. Design: Retrospective study. Setting: Outpatient rehabilitation center. Participants: Patients with unilateral (group 1, n=42) and bilateral vestibular dysfunction (group 2, n=19). Main Outcome Measures: All patients were evaluated before and after eight weeks of customized vestibular rehabilitation for disability (dizziness handicap inventory [DHI], activities-specific balance confidence scale [ABC]), dynamic balance (timed up and go test [TUG], dynamic gait index [DGI]), and postural stability (static posturography). In this study the aim was to compare the effects of vestibular rehabilitation on disability, balance, and postural stability in patients with unilateral and bilateral vestibular dysfunction. Level of Evidence: Level 2. Results: The differences between DHI, TUG, DGI, and fall index (as assessed by static posturography) scores before and after the exercise program were statistically significant in both groups (p<0.05). There were no significant intergroup differences in any of the parameters evaluated (p>0.05). Conclusion: In this study vestibular rehabilitation was found to be equally effective in unilateral and bilateral vestibular dysfunction patients for improving disability, dynamic balance, and postural stability. Patients with bilateral dysfunction causing more disability and greater handicap may indeed regain their functions as in patients with unilateral vestibular dysfunction by receiving appropriate and adequate vestibular rehabilitation.

No. 174 Proximal Muscle Weakness as a Result of Osteomalacia Associated With Celiac Disease in a Young Woman: A Case Report.

Hitmi Kocyigit; Ozlem Akan, MD; Bengi Ozoglu Oz; Hatice Alev Guran.

Disclosure: None. Setting: Tertiary care university hospital. Patient: A 24-year-old woman with osteomalacia who had symptoms including proximal muscle weakness and pain. Case Description: 24-year-old woman suffering from back pain, bilateral hip pain, and difficulty in walking in addition to periodic abdominal pain and diarrhea for 18 months was reported. Her symptoms had started in the first trimester of pregnancy. In her physical examination, bilateral hip rotational range of motion was limited, proximal muscle weakness and waddling gait pattern were determined. Assessment/Results: Her lumbar spine and hip MRI revealed no obvious pathological findings. Electromyography was reported in myopathic pattern. Physical examination and normal values of Cr: 112 U/L, supplied to exclude the diagnosis of primer muscle diseases. Muscle biopsy was taken. Laboratory findings of 25-OH vitamin D: 2.8 μg/L, Ca: 7 mg/dL, ALP: 240 U/L, P: 2.6 mg/dL, PTH: 592 pg/mL, BUN: 17 mg/dL and creatinine 0.52 mg/dL led to the diagnosis of osteomalacia with normal renal function. Gastrointestinal symptoms and positivity of antigliadin antiendomysium antibodies (IG G) strengthened suspicion of celiac disease as a cause of the osteomalacia. The diagnosis of celiac disease was confirmed with duodenal mucosal biopsy. Discussion: Osteomalacia is one of the metabolic bone diseases characterized by defective bone mineralization. Rarely proximal muscle weakness and waddling gait pattern may be seen as a result of osteomalacia. In this case we aimed to make differential diagnosis of proximal muscle weakness in a young woman. Conclusion: In patients with proximal muscle weakness and waddling gait pattern osteomalacia should be considered in differential diagnosis even in a young woman and underlying disease should be investigated.

No. 176 Determinants of the Costs of Traffic Accidents That Occurred in Medellin (Colombia) 2009 - 2010.

Luz Helena Lugo A; Paula Castro; Blanca Cecilia Cano; Delsy Alejandra Velez.

Disclosures: None. Objective: To estimate the determinants of hospital costs and rehabilitation for people injured in traffic accidents in Medellin between 2009-2010. Design: Cross- sectional study. Setting: Medellin, Colombia 2010. Participants: 483 patients between 14 and 61 years old with moderate to severe injuries according to the new injury severity score (NISS). Interventions: None. Main Outcome Measures: Direct costs, indirect costs. Results: Of the cases reported as serious 85% were men of whom 51% were between 25 and 44. The average cost of care per patient was $4,170 USD, but the figure is $5,900 USD for serious patients. The cost of materials and supplies accounts for 33% of the total, followed by drug costs with 19.5% and 16.6% of hospitalization. Rehabilitation had a share of 1.06% in the total cost with an average cost per patient of $91 USD. The cost associated with motorcycle use accounted for 84.1% of total costs. Only 81% of patients had TBI, however the cost of care in respect of whom had not increased by 62%. According to the human capital approach, the estimated productivity loss was $107,000 USD. On average each caregiver stopped receiving $1,640 USD for their work. Conclusions: The severity of the injury, hospital, and intensive care unit are fundamental determinants of the cost of care. The high costs of osteosynthesis material may be due to the lack of regulation of the market by the Colombian government. Lost productivity is closely related to the age, group socio-economic status, education, and occupation of the patient.


Macias-Hernández Sí, MSc; R. Coronado-Zarco, MSc; Soria-Bastida Ma, Lara-Vazquez (Orthopedic Rehabilitation Division- INR México).

Disclosure: None. Objective: To estimate the osteoarthritis prevalence of the knees, hips, and hands according to clinical criteria in the population over the age of 40 in Mexico. Design: Cross- sectional prevalence study. Settings: Mexico federal district. Participants: 156 subjects: 40 (25.6%) men and 116 (74.4%) women with a mean age of 54 ± 10.29 years were included. Interventions: Not applicable. Main Outcome Measures: History and physical examination was performed on each subject and the classification criteria for clinical OA of the knee, hips, and hands proposed by the American College of Rheumatology were applied. Results: The prevalence of knee OA in the study population was 14.7% but the frequency of knee pain was 64.1%; 34% were positive for clinical diagnosis of OA of the hip and 48.7% had hip pain. 13.4% meet the clinical criteria for hand OA although 57% individuals had pain on hands or fingers. Conclusions: This is the first study of the prevalence of OA performed by applying the classification criteria of clinical OA. The results show greater prevalence than that reported previously in Mexico and much higher prevalence for pain at all locations. It is needed to draw out a national sample in order to generalize the results to the whole country.

No. 178 Use of ICF Framework in Stroke Rehabilitation.

Jagdish Maharaj.

Disclosure: None. Objective: To introduce of ICF framework in an inpatient stroke rehabilitation program. Design: Prospective pre and post intervention functional status assessment. Setting: Inpatient stroke rehabilitation unit. Participants: 56 consecutive stroke subjects admitted for rehabilitation 1st January to 31st December 2012. Intervention: All subjects were assessed for their self-care and cognitive functioning at admission and at the end of rehabilitation therapy intervention prior
to discharge and the outcome expressed using the ICF framework. **Main Outcome Measure**: Comparison of pre and post rehabilitation functional status using ICF framework. **Results**: Stroke subjects comprised 80% male, average age 72.4 years, 89% ischaemic stroke with an average inpatient length of stay of 38.3 days. As a cohort, the subjects showed different levels of functional improvements in study domains of eating (D550), caring for body parts (D520), washing oneself (D510), dressing (D540), toileting (D530), urination functions (B620), defecation functions (B525), transferring oneself (D420), walking (D450), conversation (D350), speaking (D330), basic interpersonal interactions (D750), solving problems (B177), and memory functions (B144). **Conclusions**: ICF framework can be used to code and compare functional status in stroke rehabilitation. Stroke cohort in this study showed improvements in all aspects of functional domains studied.

No. 179 Clinical Assessment of Intra Articular Administration With Collagen-Polyvinylpyrrolidone in Knee Osteoarthritis. Alan Martínez Mochezuma; Dra. Sofía Durán Hernández; Manuel Castillejos; Norma E. González Hernández.

**Objective**: To analyze the effect of intra articular administration with collagen-polyvinylpyrrolidone (CLG-PVP) in clinical manifestations of knee osteoarthritis in order to determine its ability to improve patient symptoms with grade II knee osteoarthritis. **Design**: Experimental longitudinal prospective and comparative. **Setting**: Rehabilitation hospital service. **Participants**: A total of 44 patients with grade II knee osteoarthritis according to Lawrence and Kellgren classification were included in the study. **Interventions**: Previous patients consent CLG-PVP was applied into knee articulation three doses per knee. **Main Outcome Measures**: At day one and ninety were realized Western Ontario MacMaster University Index (WOMAC), visual analogue scale (VAS), and muscle force of knee perarticular muscles. **Results**: Applying CLG-PVP in patients was associated with a statistically significant decrease in the initial and final values recorded by VAS and WOMAC questionnaires; also muscle strength record showed significant increase between the initial and final parameters after drug application. **Conclusions**: CLG-PVP is a good therapeutic option to treat grade II gonarthrosis patients. It reduces pain and stiffness and improves joint function and this clinical improvement contributes indirectly to enhance muscle strength.

No. 180 The Effect of Ambulatory Rehabilitation in the Maintenance-Phase Rehabilitation. Masayuki Abe; Osamu Ito; Masahiro Kohzuki.

**Disclosure**: None. **Objective**: Role of the maintenance-phase rehabilitation has expanded to present aging progresses in Japan. This study aims to examine the effects of individual rehabilitation and outside activity practice in elderly persons during ambulatory rehabilitation. **Design**: Before-after study. **Setting**: Effect of outpatient rehabilitation. **Participants**: Six support needed elderly in ambulatory rehabilitation. **Interventions**: In individual rehabilitation, physical therapists conducted muscle strengthening exercise, practice walking, and stair-climbing practice twice a week. Outside activity practice was carried out in 4 times, one time every month. Each practice set was a different route which included the following checkpoints: rough road walking, continuous walking, climb and descend stairs, and pedestrian walking. Destination was set to park, supermarkets, and living area. Physical therapists, nurses, care workers were accompanied and confirmed checkpoint. The goal of individual rehabilitation was reflected by the effect of outside activity practice in participant. **Main Outcome Measures**: Body function was valued by grip strength, one leg standing, 5m walking test, timed up and go test (TUG), 6 minute walk distance (6MD), and continuous walking distance. Psychological function was valued by elderly status assessment set (E-SAS) and LS-100. **Level of Evidence**: Level 1 (likely reliable). **Results**: Through outside activities practice right leg standing, left leg standing, 5m walking test, continuous walk, distance was improved of all participants. Two participants who had used a t-cane were able to walk without it. Psychological function of E-SAS was improved. **Conclusions**: Outside activity abilities all of participants were improved by attending to ambulatory rehabilitation. It is necessary to consider the living environment and physical performance goals in maintenance-phase rehabilitation.

No. 181 Validation of the Japanese Association of Rehabilitation Medicine Fall Risk Assessment Tool. Koichi Miyakoshi; Takumi Nasu; Shizuko Takahashi; Takashi Natsume.

**Disclosure**: None. **Objective**: Patient falls have been identified as a significant problem in hospitals and can result in physical injury and undesirable emotional and financial problems. Many fall risk assessment tools have been developed. However few have been validated in a different study sample. The purpose of this study was to validate the Japanese Association of Rehabilitation Medicine (JARM) Fall Risk Assessment Tool developed by the JARM Guideline Committee of Risk Management. The tool consisted of 6 items: history of fall, walking ability, mental function, visual disturbance, urinary disturbance, and drugs. The score ranges from 0 to 10. Higher score means higher risk of fall. We used the receiver operating characteristic (ROC) curve to analyze the relationship between fall incidence and the fall risk assessment score. SPSS 19 Japanese edition was used to complete the analysis. **Design**: Retrospective cohort study. **Setting**: Acute care community hospital. **Participants**: Consecutive hospitalized patients over 20 years of age admitted to our hospital from April 2012 to March 2013. **Interventions**: Not applicable. **Main Outcome Measure**: Fall incidence and precision of the assessment tool. **Level of Evidence**: Level 2. **Results**: The study population consisted of 20,182 patients with a mean age of 64.6 years and mean length of hospital stay of 14.8 days. Of those enrolled 379 (1.9%) patients fell during acute hospitalization. The ROC curve derived from this model had an area under the curve of 0.82 (95% CI: 0.80-0.84). The threshold determined by the ROC curve was 3/10. Applying this prediction model the sensitivity was 72.8% and specificity was 77.0%. **Conclusions**: In this study the precision of the JARM Fall Risk Assessment Tool was validated in an acute care hospital setting. The accuracy was considered to be acceptable. Further validation is needed in various settings to demonstrate the reproducibility of the tool.


**Objectives**: The main objective of this study is to establish the normal reference values for musculoskeletal ultrasonography (MSU) in the upper limb of Mexican healthy subjects. **Design**: Observational cohort study. **Setting**: Tertiary care public hospital. **Participants**: Upper limb of 103 (66 women 37 men) healthy volunteers. **Interventions**: We scanned bilaterally with an Esaote Mylab 25 (Genoa, Italy) ultrasound machine and a multi-frequency linear probe (10-18 MHz). Biceps, subscapularis, and supraspinatus tendons, acromioclavicular joint, lateral epicondylic, and median nerve. **Main Outcome Measures**: These structures were measured in different planes longitudinal (LN) and transversal (TR) for both sides right (R) and left (L). Measures were expressed in millimeters (mm). The mean ± standard deviation. **Level of Evidence**: 3. **Results**: We studied 206 upper limbs and the normal values for MSU in the upper limb of Mexican healthy subjects we found the mean ± standard deviation: biceps tendon TR area mm² R 9.73 ± 2.39 L 9.51 ± 2.43, subscapularis tendon LN mm R 3.79 ± 0.67 L 3.87 ± 0.79, subscapularis tendon LN mm L 4.31 ± 0.89 L 4.2 ± 0.93, acromioclavicular joint mm R 7 ± 1.42 L 7.07 ± 1.51, supraspinatus tendon TR mm R 5.68 ± 1.02 L 5.46 ± 0.97, supraspinatus tendon LN mm R 5.75 ± 0.94 L 5.44 ± 0.69, lateral epicondyle: LN mm R 5.53 ± 4.81 L 5.28 ± 4.54, median nerve TR mm² R 8.7 ± 3.06 L 8.1 ± 1.99.
No. 186 Healthcare Utilization Associated With Obesity and Physical Disabilities.
Mark D. Peterson; Elham Mahmoudi, PhD.

Objective: The purposes of this study were to estimate the annual healthcare utilization associated with high BMIs among adults with and without physical disabilities and examine associations between BMI, healthcare utilization, and chronic obesity-related comorbidities.

Design: Weighted cross-sectional and multivariate methods were used to estimate healthcare utilization among adults with and without physical disabilities across standard BMI categories. Setting: The 2002-2011 Medical Expenditure Panel Survey (MEPS). Participants: Population representative sample of 215,107 individuals aged 18 years and older. Of those, 36,349 adults reported moderate or significant physical disabilities. Main Outcome Measures: The primary outcomes were annual total healthcare costs, physician office visits, and hospitalization. Results: Adults with physical disabilities had higher prevalence of obesity, were older, reported less exercise and had lower socioeconomic status (p<0.0003). Unadjusted healthcare costs for adults with physical disabilities were 4-times greater and was coincident with significantly greater frequency of medical provider office visits (12.9 vs. 4.5), higher prevalence of hospital visits (21% versus 6%), and more total nights of hospitalization (1.9 versus 0.25). Obese adults with physical disabilities incurred more than 2.5 times the adjusted total healthcare costs ($7885) than adults who were neither overweight/nor physically disabled ($3178). Adults with physical disabilities also had significantly greater prevalence of chronic conditions across age categories e.g. type 2 diabetes, asthma, hypertension, cardiovascular conditions, joint pain, arthritis and stroke. Conclusions: Obesity is associated with increased healthcare utilization independent of age, race, education, and socioeconomic status; however there was a significantly greater burden among overweight and obese adults with physical disabilities. Obesity plus physical disabilities represents $23.9 billion/year or nearly 50% of the total healthcare costs, physician of care visits, and hospitalization.

No. 188 Reliability of Quality of Life Instrument Specific to Knee and Hip Osteoarthritis.
Rodríguez Eliana; Ramírez Carolina (School of Physical Therapy, Industrial University of Santander, Bucaramanga, Santander Colombia, Rodíguez Micagos).

Disclosure: None. Objective: To assess the internal consistency, reliability, and agreement level of the specific instrument for the Outcome Osteoarthritis Knee And Hip Quality Of Life (OAKHQL). Design: Evaluation of diagnostic technologies with cross-section sampling Setting: School of Physical Therapy, Bucaramanga, Colombia. Participants: 24 subjects were included 5 male subjects and 10 females (64±7 years old) with medical diagnosis of knee osteoarthritis (OA). Interventions: Before the first measurement each participant had a period of familiarization with the instrument and then the OAKHQL was used and then again 6 days before the first evaluation. Main Outcome Measures: 43 items are included in the instrument and 3 attributes: physical activity, mental health, pain, support social, social activities. Level of Evidence: Level 1. Results: The internal consistency of each attribute was analyzed with Cronbach’s alpha test and test-retest reliability with the intraclass correlation coefficient (ICC2K) and agreement limits were established by the Bland and Altman method. We found a good internal consistency (08) for physical activity, mental health, and pain attributes; and acceptable (07) for social support and social activities. Reliability was good (ICC 08) for physical activity and mental health, acceptable (07) for social support and pain; and poor (0.6) for the social activities attribute. Agreement level was moderate in all attributes except for social support and social activities. Conclusions: The results of this study indicate that the instrument shows a moderate internal consistency and reliability and agreement level. Our findings support the use of this instrument in controlled clinical trials. The instrument familiarization is necessary to ensure confident results.

No. 191 Effects of Listening to Music on the Self-Efficacy for Exercise in Healthy Elderly People: A Pilot Study.
Hiromi Sakai; Naoto Kamide; Osamu Ito; Masahiro Kohzuki.

Objective: The purpose of this study was to trial to determine whether listening to favorite and synchronized music led to improved self-efficacy for exercise and continuation of exercise for care prevention in independent elderly people. Materials and Methods: A total of 66 community-dwelling elderly people who independently maintained activities of daily living participated in this study. A group of psycomotoras del niño con discapacidad. Determinar el grado de mejoramiento de la calidad de vida. Pacientes: Niños de 6-10 años. En jóvenes entre 3 a 12 años. Niños con autorización médica. Pacientes que han recibido y reciben terapia convencional en algún servicio de rehabilitación o en colegios especiales y nunca han recibido hipotera- pie. Variable independiente: hipoterapia: tratamiento especializado no convencional de rehabilitación que utiliza al caballo como recurso terapeuti- co de estimulación dos sesiones semanales de veinticinco minutos y la duración del ciclo terapéutico es de 5 meses. Variables dependientes. Alteraciones del tono postural. Alteraciones del equilibrio. Alteraciones de la conciencia corporal. Alteraciones cognitivas cambios emocionales. Resulta- dos: Con un nivel de confianza del 95% podemos afirmar que la hipoterapia disminuye significativamente las alteraciones del equilibrio. Con un nivel de confianza del 95% podemos afirmar que la hipoterapia disminuye significativamente las alteraciones de la conciencia corporal. Con un nivel de confianza del 95% podemos afirmar que la hipoterapia disminuye significativamente las alteraciones emocionales. Con un nivel de confianza del 95% podemos afirmar que hipoterapia disminuye significativamente las alteraciones emocionales.

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participants that performed exercise with music was compared with the control group that performed exercise without music. The exercise classes were held 11 times (i.e. once a week for a 3-month period). The self-efficacy for exercise scale was used to assess an individual’s confidence in their ability to continue exercising before initiating and immediately after finishing the 3-month exercise program between the two groups.

Results: The self-efficacy for exercise was significantly higher in the intervention group than the control group after the 3-month intervention (p < 0.05).

Conclusion: Music selected by participants can promote self-efficacy for exercise in care preventive exercise. These results suggest the possibility that music contributes to the continuation of exercise for care prevention in elderly people. Additional research is required to confirm these observations.

No. 192 Effects of Exercise Training on Renal Function in Salt-Sensitive Hypertensive Rats.
Yoshikyo Sakata; Osamu Ito, MD Phd; Akihiro Sakayama; Masahiro Kohzuki.

Disclosure: None. Objective: Exercise training (EX) is well known as an effective therapy for hypertension. However little has been reported on effects of EX on salt-sensitive hypertension and concomitant renal disorder. We investigated effects of EX on blood pressure and renal function in salt-sensitive hypertension. Basic research. Methods: High salt diet and EX with treadmill. Participants: Six-week-old male Dahl salt-sensitive (DAHL-S) rats were divided into four groups: 1) normal salt diet (NS) group (NS-SED n=10), 2) NS plus EX group (NS-EX n=10), 3) high salt diet (HS) group (HS-SED n=11), 4) HS plus EX group (HS-EX n=11).

Interventions: NS and HS groups were fed with diet containing 0.6% and 8% NaCl, respectively. EX groups underwent treadmill running for eight weeks. Main Outcome Measures: Blood pressure, renal function histology and oxidative stress. Level of Evidence: Level 1 (likely reliable). Results: HS induced severe hypertension, massive proteinuria, renal dysfunction, and glomerulosclerosis. Although EX did not change blood pressure and plasma creatinine levels, EX significantly improved proteinuria, creatinine clearance, and glomerulosclerosis. HS markedly increased urinary thiobarbituric acid reactive substances (TBARS) an index of oxidative stress, but EX significantly decreased urinary TBARS, there was no significant difference in plasma TBARS among all groups. EX significantly decreased H2-stimulated xanthine oxidoreductase activity but not NADPH oxidase activity in the kidney. Conclusion: This study demonstrated that EX improves HS-induced renal disorder independently of blood pressure in DAHL-S rats. The improvement of oxidative stress in the kidneys may be involved in the renoprotective effects of EX. Thus EX may be an effective therapeutic approach for preventing the development of renal disorders in salt-sensitive hypertension.

No. 193 Effects of Exercise Training on Renin-Angiotensin System in the Kidney of Dahl Salt-Sensitive Rats.
Akihiro Sakayama; Osamu Ito, MD Phd; Yoshikyo Sakata; Masahiro Kohzuki.

Disclosure: None. Objective: Exercise training (EX) has anti-hypertensive and renal protective effects. Renin-angiotensin system (RAS) is involved in the regulation of blood pressure and renal function. In this study we investigated the effects of the EX on renal RAS in Dahl salt-sensitive rats.

Design: Basic research. Setting: Treadmill EX. Participants: Six-week-old male Dahl salt-sensitive (DAHL-S) rats were divided into four groups: 1) normal salt diet (NS), 2) NS + EX, 3) high salt diet (HS), 4) HS+ EX.

Intervention: NS or HS groups were fed diet containing 0.6% or 8% NaCl. Treadmill running was performed in EX groups for 8 weeks (5 days/week; 60 min/day at 16-20 m/min 0 % grade). Main Outcome Measures: Blood pressure, renal function, histology and protein expressions of RAS components in renal cortex and medulla. Level of Evidence: Level 1 (likely reliable). Results: HS significantly elevated systolic blood pressure, and EX did not change. HS significantly decreased creatinine clearance, but EX significantly improved. HS induced kidney weight gain and glomerular sclerosis, but EX suppressed them. HS increased angiotensinogen expressions and decreased renin expressions in the cortex and medulla. HS increased angiotensin II type 1 (AT1) receptor expression in the medulla and MAS receptor expression in the cortex but decreased angiotensin II type 2 (AT2) receptor expressions in the cortex and medulla. EX improved HS-increased angiotensinogen and AT1 receptor expressions only in the medulla. EX improved HS-decreased renin expressions in the cortex and medulla and HS-decreased AT2 and MAS receptor expressions only in the medulla.

Conclusions: EX improves HS-induced renal damage with changes of RAS component in the blood pressure-independent manner. These results suggest that EX may have beneficial effects in HS-induced renal damage.

Chiho Sasaki; Takashilasai, MD Phd; Masayoshi Yamamoto; Yuji Honderam (Teikyo University School of Medicine Department of Rehabilitation Medicine).

Disclosure: None. Objectives: To know the influences of different type of breathing on the circulatory physiological index in scuba diving (SD) in order to refer to the disabled with restrictive ventilatory dysfunction.

Design: Preliminary cross-sectional study. Setting: Real recreational SD and indoor swimming area around SD participant. a 42-year-old healthy female standard diver.

Interventions: After the portable Holter recorder was put on the body electrocardiogram (ECG), blood pressure (BP), and oxygen saturation (SPO2) were recorded during 3 SDs performed by wearing special dry suit for waterproofing. Each SD (20m/40 minutes) was performed by boat entry in the sea of Okinawa, Japan. 1st SD was performed with deep abdominal breathing (DB), 2nd and 3rd SD with usual breathing (UB) as control data on the other day. 1st SD was also compared of those data in the usual daily living followed by the SDs.

Main Outcome Measures: Heart rate (HR), BP, and SPO2. Level of Evidence: Level 3. Results: Average HR (81 bpm), systolic BP (124 mmHg), and SPO2 (97.17%) during DB and that (124) in the usual daily living.

Conclusions: It might be possible that deep breathing suppress the extraordinary change of HR and BP during SD. Reprinted with permission.

No. 195 Rehabilitation for Extensive Burns.
Hiroshi Sato; Hidedhi Yumikake; Shiro Hanakawa; Naoya Kobayashi.

Objective: Here we treated skin contraction and restricted joint range of motion (ROM) which were caused by thickened scar after skin grafting for extensive burns depending on wound healing process. We report favorable results obtained by minimizing functional disorders and activities of daily living (ADL) disorders.

Setting: A rehabilitation center of the 119-bed general hospital in Japan. Participants: A housewife in her 80s with good premorbid ADL sustained extensive burns to both thighs as well as the right hip, left back (third degree 21%), and right hand (second degree 1%) when her clothes caught fire during a controlled field burning. Burns covered 22% of her body; the burn index was 21.5, and the prognostic burn index was 103.5.

Interventions: The patient received tailored multifaceted rehabilitation including joint ROM, muscle strength maintenance and systemic adjustment trainings depending on wound healing process.

Main Outcome Measures: Changes in hematological data, joint ROM, functional independence measure (FIM) and motion morphology were examined by dividing the wound healing process into stages 1 to 4.

Results: Hemoglobin 9.4 9 0.7 g/dl hematocrit 29.2 2 3.2% and albumin 2.0 3 0.3 g/dl, joint rom: right hip flexion 80° 110° right knee flexion 80° 110° and right ankle dorsiflexion 75° 10°; FIM 60 2 120 points; gatch up sitting posture 50° 2.0. Admitted to a nursing facility for continued ADL training; able to walk with a t cane. Assessment: Providing appropriate
assistance as well as psychological support after skin grafting throughout rehabilitation is important. Here we recovered the patient’s full potential by improving physical function and ADL at each stage. **Conclusions:** Emergency medical care is prioritized in the acute stage of burns and little attention is paid to physical function. However early intervention is needed to recover physical function through cooperation with other professionals.

No. 197 Postural Control and Visual Function in the Adaptation Process.
Kotomi Shiota (Waseda University Japan).

**Objective:** The visual system function is important for the maintenance of the stable balance ability. If an individual cannot obtain clear information their balance becomes unstable. In addition when moving from a light to dark room (or vice versa) the visual system requires time to adjust before it can recognize objects. We researched postural control in the adaptation process that occurs when one moves between light and dark rooms. Setting: Postural control participants: 19 young people (19-21 years old).

**Interventions:** First we measured body sway by using Gravicorder® in the illuminated area, after that each subject wore an eye mask and stayed in the dark for 5 minutes. The subject then removed the eye mask and we measured body sway in the illuminated area. Body sway was then measured during anadaptation process 3 and 7 minutes later. We compared the total length of body sway (LNG) in an illuminated area and in darkness under three conditions. **Main Outcome Measures:** The total length of body sway (LNG) by using Gravicorder® in an illuminated area and in darkness under three conditions. **Results:** We found that body sway gradually improved just after (LNG: 132.7 ± 32.4 cm), 3 minutes later (110.5 ± 32.4 cm), and 7 minutes later (91.5 ± 19.6 cm) (p<0.05). At the last point the data were equal to those collected in the beginning. **Conclusions:** This finding suggests that a change in visual information that occurs during the process of adapting from darkness into illumination affects postural control. In individuals in whom walking ability decreases, particularly in elderly individuals, the incidence of falls during trips to the restroom at night is high. Accordingly we believe that the visual adaptation process affects postural control. Therefore a further study is necessary.

Ken Sugiyama; Takeo Kondo; Yoshimi Suzukamo; Shin-Ichi IZumi.

**Setting:** University hospital. **Patient:** A 37-year-old woman with hemiparesis caused by diffuse axonal injury (DAI). **Case Description:** The patient worked as an English teacher. She fell down the stairs and sustained a head injury. She exhibited a partial loss of consciousness, scored E3V4M5 on the Glasgow Coma Scale after the injury, and was transferred to our hospital. On admission the patient presented with a right homonymous hemianopsia, memory and attention disorders, and left hemiparesis.

Although conventional magnetic resonance imaging (MRI) revealed a lesion in the left occipital lobe no apparent cause for the left hemiparesis could be identified. The patient subsequently participated in a rehabilitation program which sufficiently improved her cognitive function and allowed her to return to work one year later. Unfortunately the left hemiparesis remained. Two years after the injury we performed additional MRI which revealed the same occipital lesion noted earlier. However no evidence was found with regard to right cerebral hemisphere or brainstem abnormalities which were presumed to be responsible for the left hemiparesis. Therefore diffusion tensor imaging (DTI) and fiber tractography (FT) were used to identify the cause of the patient’s left hemiparesis. **Assessment/results:** DTI fractional anisotropy revealed changes in the right cerebral peduncle the right posterior limb of the internal capsule and the right corona radiata when compared with the corresponding structures on the patient’s left side and in healthy controls. On FT evaluation the right corticospinal tract (CST) was poorly visualized compared with the left CST as well as the CST in healthy controls. **Discussion:** These findings supported the notion that the patient’s left hemiparesis stemmed from DAI-induced axonal damage in the right CST. **Conclusion:** If conventional MRI fails to reveal any lesion that could be responsible for hemiparesis in a patient with DAI, evaluation using DTI and FT should be undertaken.

No. 200 Molecular Background of the KCC2 Up-Regulation Secondary to Treadmill Training After Spinal Cord Injury in Adult Rats.
Syoichi Tashiro; Munehisa Shinozaki; Masaya Nakamura; Meigen Liu.

**Background:** Spasticity and allodynia are major sequelae after spinal cord injury (SCI). We reported that spasticity and allodynia are attenuated by training induced endogenous BDNF through the up-regulation of KCC2. However the role of BDNF in the regulation of KCC2 is context-dependent; the activation of SHC pathway in the absence of PLCα Activation is needed in the up-regulation of KCC2 and still unclear in the injured spinal cord. Here we investigated how training affects post SCI spasticity and allodynia focusing on KCC2 regulation by BDNF. **Material and Method:** In 50 adult rats, moderate contusive SCI was induced at T10 level using an IH impactor (200 kdynes). In the trained group, treadmill training was conducted using robotic device from 7 to 21 days post-injury (DPI). No treadmill training was performed in the untrained group. In the sham group only T10 laminectomy was performed without any injury. Spasticity and allodynia were assessed up to 49 DPI. Changes in BDNF, KCC2, SHC, and PLCα Protein expressions of lumbar enlargement were assayed by Western-blotting at 14, 28, and 49 DPI. **Result:** There was a significant difference in BDNF expression between the trained and untrained groups at 14 DPI but not at 49 DPI. PHOSPHO-KCC2 expression was significantly up-regulated at 49 DPI and had significant correlation with the values of spasticity and allodynia testing. SHC expression was not affected neither SCI nor the training besides PHOSPHO-KCC2 expression was significantly down-regulated only in SCI operated animals regardless of training at the 14 DPI than the sham group. **Conclusion:** Down-regulation of PHOSPHO-PLCα possibly contributes in the KCC2 regulation by BDNF in the early phase after SCI, training induced BDNF did not induced KCC2 down-regulation. There would be other mechanisms in which BDNF longitudinally up-regulates KCC2 that result in attenuation of spasticity and allodynia.

No. 202 Estimation of Presence of Pharyngeal Residue From the Externally Recorded Swallowing Sounds.
Yohei Teramoto; Tomoyuki Ueno; Dushyantha Jayatilake; Akira Matsuura.

**Objective:** To investigate the automatic estimation of the presence of residue at the pyriform sinus from the swallowing sound (SS) recorded through a simple external microphone worn on the neck. **Disclosure:** This study is funded by the Ministry of Health, Labour and Welfare in Japan. **Setting:** X-ray fluoroscopy room at the university hospital. **Participants:** 24 subjects hospitalized in the university hospital who were having problems in swallowing and were recommended to the rehabilitation department for the evaluation for dysphagia. **Methods:** We obtained 38 numbers of 3ml water swallows from their videofluoroscopic swallow studies (VFSS) that were conducted while simultaneously recording the SS. By using an automatic swallow detection algorithm developed using Matlab we extracted the audio segments corresponding to the water swallows and calculated the area under the swallow signal after normalizing them to have a peak amplitude of 1. We compared the SS duration and the SS signal area against the residue at the pyriform sinus after swallowing. **Results:** Subjects who were having residue at the pyriform sinus after swallowing (17 swallows out of 38) exhibited higher values of SS signal areas (mean=0.069 vs. Mean=0.038 p-value<0.05). On the other hand the
No. 203 Eficacia De La Toxina Botulínica Tipo A Aplicada En El Palmaris Longus En Pacientes Con Síndrome Del Túnel Del Carpo Idiopático.
Trujillo Millán A.; Díaz Jaimes E.; Rosas Barrita A.; Ocaña Martínez CI.

Introducción: Es ampliamente conocido el efecto de la toxina botulínica tipo A (TBA) en el músculo y controvertida su utilidad en el manejo de dolor. Por otro lado se ha demostrado la influencia del palmaris longus en el aumento de la presión intracarpal. Objetivo: Evaluar el efecto clínico de la tba aplicada en el palmaris longus en pacientes con síndrome del túnel de carpo idiopático (STCI). Material y Métodos: Se realizó un estudio prospectivo longitudinal comparativo y experimental. Se incluyeron 11 pacientes con diagnóstico de STCI 7 bilaterales y 4 unilaterales (18 manos afectadas). Se dividieron en 2 grupos aleatorios al grupo experimental se le aplicó 25 UI de TBA. Los cambios se evaluaron en base al cuestionario Boston para túnel del carpo y el cuestionario Michigan. Resultados: En el grupo experimental se observó una diferencia ≥ 0.8 puntos en relación a la severidad de los síntomas a las 16 semanas (p<0.001) lo que representó una mejora en 7 de 10 manos afectadas en contraste con el grupo control en el que no hubo mejora significativa (p=0.04). En relación al estado funcional en el grupo experimental la diferencia fue estadísticamente significativa con una (p=0.001) sin embargo la diferencia ≥ 0.8 a las 16 semanas sólo se observó en 3 de 10 pacientes del grupo de experimental y ningún paciente en el grupo placebo (p=0.0147). Consideraciones finales: La aplicación de toxina botulínica tipo A en el palmaris longus disminuye los síntomas clínicos en pacientes con STCI.

No. 204 Treatment and Rehabilitation Costs of Moderate and Severe Injuries Caused By Traffic Accidents.
Deisy A. Vélez, MD; Luz H. Lugo, MD Msc; Blanca C. Cano; Paula A. Castro.

Disclosure: None. Objective: To know the direct and indirect costs generated from the treatment and rehabilitation of patients with moderate or severe injuries caused by traffic accident in the world. Design: Systematic review. Setting: Studies published in 12 countries. Participants: Studies that evaluated costs of attention in traffic accident victims over 16 years old published between 2008 and 2013 in Spanish or English. Interventions: None. Main Outcome Measures: Direct costs, indirect costs, burden of disease, disability and rehabilitation related costs. Results: 14 studies were included 6 of good quality. We found studies up to 567,000 patients and 10 years lasting. Direct costs were up to 22,831 USD and indirect costs of 22,889 USD per patient; the direct costs were exceeded by the indirect costs. The burden of disease showed high variability among the different countries. One study found 1,305,714 delays generated by traffic accidents. Three studies evaluated disability: in one study 60% of the patients with severe TBI and 20% with moderate TBI had short term disability. In other study 29.1% of the injured patients had residual disability, and in a third study 4.6% of the patients sustained a long term disability. In one study 11.2% from the medical costs were generated by rehabilitation, in other study it was 29% thus representing the second most important medical expense. Inpatient rehabilitation represented 2% of the costs. We found great heterogeneity in the evaluated parameters cost’s components time horizon, and outcomes presentation. Conclusions: The indirect costs incurred in traffic accidents are greater than direct costs. The costs of disability and rehabilitation are poorly evaluated. There is great heterogeneity in the quality characteristics of costs studies in traffic accident nor critical reading guides.

No. 206 Dysphagia Assessed by the 10-Item Eating Assessment Tool Is Associated With Malnutrition in Frail Elderly.
Hidetaka Wakabayashi; Hironobu Sashika.

Objective: The 10-item eating assessment tool (EAT-10) is a self-administered questionnaire for dysphagia screening with each item scored from 0 to 4. An EAT-10 score above 3 is abnormal and indicates dysphagia. The objective of the study was to assess the association between the EAT-10 and malnutrition in frail elderly. Design: Cross-sectional study. Setting: Geriatric health services facilities, acute hospitals, and community-welling. Participants: 237 frail elderly aged 65 years and older with dysphagia or suspected dysphagia. Interventions: Not applicable. Main Outcome Measures: Mini nutritional assessment short form (MNA-SF). Scores between 12-14, 8-11, and 0-7 indicate normal nutritional status at risk of malnutrition and malnourished respectively. Level of Evidence: Level I. Results: There were 90 males and 147 females. Mean age was 82 years. Eighty-nine elderly were in geriatric health services facilities, 28 were in acute hospitals, and 120 were community-welling. Median Barthel index score was 55. Median EAT-10 score was 1 (inter-quartile range: 0-9) and 101 respondents were more than 3. Age, gender, dwelling and the Barthel index score differed significantly between two groups classified by the EAT-10 scores (0-2 and 3-40). The MNA-SF revealed that 81 elderly were malnourished, 117 were at risk of malnutrition, and 39 had a normal nutritional status. The EAT-10 score was significantly correlated with the MNA-SF score (the Spearman rank correlation coefficient: r=-0.305 p<0.001). The specificity and sensitivity of the EAT-10 with a score 3 or above for malnutrition were 0.652 and 0.598, respectively. The EAT-10 score, age, gender, dwelling, and the Barthel index score were included in logistic regression analysis of the MNA-SF (malnourished or not). The EAT-10 score (p = 0.005 odds ratio: 0.944 95% CI: 0.907-0.983), dwelling, and the Barthel index score were independently associated with the MNA-SF. Conclusions: Dysphagia assessed by the EAT-10 is associated with malnutrition in frail elderly.

No. 209 Effectiveness of Feeding and Swallowing Therapy in Patients With Dysphagia.
Shinya Yura; Aki Nakamani; Yasutaka Tagaki; Kenji Kagechika.

Objective: To clarify the effectiveness of feeding and swallowing therapy in patients with dysphagia we report the factors related to the effectiveness of the therapy. Design: Retrospective study with multivariable analysis. Setting: All patients were unable to eat orally. Participants: 45 patients with dysphagia. Interventions: In patients with slight dysphagia evident on screening such as repetitive saliva swallowing test or modified water swallow test, the direct swallowing therapy was performed carefully. Video fluoroscopic examination of swallowing or video endoscopic examination of swallowing was performed in patients with severe dysphagia. In the severe cases the safety adequate indirect and direct swallowing therapy were drafted based on the findings of the examinations. Main Outcome Measures: To study the factors related to the effectiveness of therapy, the patients were examined with respect to sex, age, period from onset to beginning of the therapy, therapy period, and physical conditions. Logistic regression analysis was used for analysis of the correlation between the therapeutic effectiveness and these items. Results: In 45 dysphagia cases no improvement of swallowing function was found in 12 cases (26.7%), moderate improvement in 21 cases (46.7%), and good improvement in 12 cases (26.7%). The only factor related to the effectiveness of the therapy was level of dry swallowing (p=0.005 odds ratio:6.445). Conclusions: These results indicate that feeding and swallowing therapy before dry swallowing is lost is effective for improvement of swallowing function in patients with dysphagia.
PAIN AND SPINE MEDICINE

No. 212 Intradiscal Steroid Injection to Treat Patients With Neuropathic Pain Due to Discogenic Low Back Pain.

Aydemir Koray; Yavuz Ferdi; Taskaynatan Mehmet Ali (Gulhane Military Medical Academy, Taf Rehabilitation Center Department of PMR, Ankara, Turkey).

Disclosure: None. Objectives: An objective of this study was to investigate the effectiveness of intradiscal steroid injection in the treatment of discogenic low back pain (DLBP) with neuropathic pain (NEP).

Setting: Tertiary level hospital. Participants: A total of 18 patients with DLBP were enrolled and divided into two groups based on having NEP and not. Group 1 included 11 patients who had DLBP without NEP, and group 2 included 7 patients who had DLBP with NEP. Main Outcome Measures: Duration and intensity of LBP, the Quebec Back Pain Disability Scale (QBPSD), the daily sleep interference scale (DSIS), and a Leeds assessment of neuropathic symptoms and signs (LANSS) pain scale. Level of Evidence: Level 3 evidence. Results: The mean age of the 18 patients was 43.7±12.7 (range: 24-60) years. Of these patients 9 (50%) were male. In our study 38.8% of the patients had DLBP with NEP, whereas 61.2% had mainly nociceptive pain. As we investigated the mean changes of the QBPSD scores and intensity of LBP in patients with a LANSS score ≥12 a statistically significant reduction was found at the second week and third month after the treatment compared to pre-injection values (p<0.05). The mean reduction in the intensity of DLBP the QBPSD scores and the DSIS scores from baseline to second week and third month after the treatment was greater in group 2 than in group 1. However there was no significant difference in the mean reduction of the outcome parameters between the two groups (p>0.05).

No. 213 Recurrent Complex Regional Pain Syndrome Type 1 With Bilateral Hand Involvement: A Case Report.

Koray Aydemir; Volkan Yilmaz, MD; Taner Dandinoglu; Berke Aras (Gulhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, Ankara, Turkey).

Disclosure: None. Setting: Tertiary care university hospital. Patient: A 21-year-old male with bilateral upper extremity complex regional pain syndrome (CRPS) type-1. Case Description: The patient was admitted with complaints of swelling, sweating, and pain in both hands which had begun spontaneously. He had similar symptoms three years before and his complaints had healed spontaneously in 3 months. On physical examination the dorsum of both hands were cyanotic and swollen, the palmar sides of both hands were cold and damp. Widespread allodynia and hyperalgesia were noted. Periarticular osteoporosis of the hands were observed on x-ray. Magnetic resonance imaging (MRI) findings in the carpal bones were compatible with CRPS. An arachnoid cyst in right cerebellar hemisphere and disorganization in the subcortical white matter in the right parietal lobe were detected in brain MRI. Functional brain MRI demonstrated an activity increase at the right parietal lobe. Slow theta waves were observed in electroencephalography. Results: After 8 weeks of physical therapy significant improvements in hand function tests are noted. Discussion: CRPS is usually provoked by a trauma or surgery but a small proportion of patients develop CRPS without a clear causative event. The underlying mechanisms are not yet clearly understood. In this case report factors that might cause CRPS and cerebrocortical dysfunction in CRPS are discussed. Non-routine methods for brain processing during allodynia are also discussed. Conclusion: Bilateral recurrent CRPS is a very rare clinical condition. Parietal brain dysfunction may explain the central pain and allodynia in this case. Clinicians should consider central nerve system pathologies in evaluating idiopathic CRPS. Reprinted with permission.


Koray Aydemir; Ismail Dede, MD; Ferdi Yavuz (Elimesgut Military Hospital, Department of Physical Medicine and Rehabilitation, Ankara, Turkey).

Disclosure: None. Setting: Secondary care hospital. Patient: A 24-year-old male with Klippel-Feil syndrome (KFS). Case Description: The patient presented to our clinic with neck and back pain with stiffness. His pain had started one year ago while working. Over time the pain had spread to the shoulders and the dorsal vertebrae. The pain was continuous and aggravating with standing and walking. On physical examination, he had facial asymmetry, torticollis, short neck, low hairline Sprengel’s deformity, and cervicothoracal scoliosis. Cervical spine range of motion (ROM) was decreased. Neurologic examination was normal. X-ray of the spine revealed fusion of the C5 and C6 vertebrae, interdiscal space narrowing at C2 and C3 levels, bilateral rudimental cervical costae, and cervicothoracal scoliosis. Ultrasound of the abdomen, echocardiogram, and audiometry were normal.

Assessments/Results: Exercises for scoliosis, cervical spine strengthening/ROM are started and non-steroidal anti-inflammatory medicine is prescribed. Modifications in lifestyle are recommended. Improvements in pain and functionality are observed. Discussion: KFS is a rare disease characterized by the congenital fusion of any 2 of the cervical vertebrae. Clinical triad of the disease consists of short neck, low hairline, and decreased ROM of the cervical spine. Also systemic findings like scoliosis, kyphosis, Sprengel’s deformity, torticollis, craniofacial asymmetry, renal and cardiac abnormalities, loss of hearing, and synkinesis may exist. Clinical characteristics and the differential diagnosis of the KFS will be discussed. Conclusion: Many of the people with KFS may be asymptomatic; symptoms of the disease may develop during time. These patients should be evaluated in terms of systemic pathologies. A multidisciplinary approach for treatment and management for the accompanying abnormalities is recommended. Reprinted with permission.

No. 215 CRPS Type-2 as the Initial Clinical Manifestation of Iatrogenic Sciotic Nerve Injury After Total Hip Arthroplasty: A Case Report.

Koray Aydemir; Umut Guzelkucuk Asst. Prof, MD; Serdar Kesikburun; Yasin Demir (Gulhane Military Medical Academy Department of Physical Medicine and Rehabilitation Turkish Armed Forces Rehabilitation Center, Ankara, Turkey).

Disclosure: None. Setting: Tertiary care university hospital. Patient: A 59-year-old female with iatrogenic sciatic nerve injury (SNI) after total hip arthroplasty (THA). Case Description: The patient presented to our clinic with complaints of severe pain, swelling, and sweating at her left foot. She had a unilateral THA for congenital hip subluxation 2 weeks before. Severe pain had started on her left foot one week after the surgery. Electromyogram (EMG), feet x-ray, and magnetic resonance imaging were normal. She was inspected by dermatology and cardiovascular surgery clinics but a specific disease could not be found. On physical examination, allodynia, hyperalgesia, hyperesthesia on left foot were observed. Manual muscle testing was unreliable due to the severe pain in left hip and left foot. 3-phase bone scan was consistent with early period CRPS. With these clinical and scintigraphic findings, the patient was considered as CRPS and physical medicine and rehabilitation programme is started. The EMG which was performed one month after the surgery demonstrated a partial axonal degeneration on the peroneal and total axonal degeneration on the tibial branches of the sciatric nerve. Discussion: Femoral nerve and more commonly sciatic nerve injuries are one of the most serious complications of the THA. CRPS type-2
is usually seen after lower extremity sciatic nerve injuries. Conclusion: CRPS type-2 occurring after THA may be the initial clinical manifestation of the sciatic nerve injury in terms of the suboptimal neurologic examination due to the serious pain and the invalid neurophysiologic testing in the early period. Reprinted with permission.

No. 216 Sacroiliitis and Tarlov Cyst: A Coincidence or an Association? A Case Report.
Koray Aydemir; Ayça Uran, MD; Emre Adiguzel; Berke Aras (Gulhane Military Medical Academy Department of Physical Medicine and Rehabilitation, Ankara, Turkey).

Disclosure: None. Setting: Tertiary care university hospital. Patient: A 28-year-old male with a large sacral Tarlov cyst (TC) and sacroiliitis. Case Description: The patient was admitted to our clinic with complaints of right inguinal and low back pain for 2 years. Previously he was diagnosed with inguinal hernia by a general surgeon. Pain was predominant in the night and he had morning stiffness for about half an hour. Family history was unremarkable. On physical examination, lumbar flexion was restricted at 50 degrees, sacroiliac joint provocation tests were positive on the right side, right inguinal palpation was painful, and neurological examination was normal. Assessments/Results: Routine laboratory tests were normal. Pelvis x-ray revealed grade 2 right sacroiliitis. Ultrasound revealed a few reactive lymph nodes in right inguinal region. Magnetic resonance imaging revealed that ileal sides of both sacroiliac joints were irregular but more prominent on the right side. A large TC measuring 60x40x20 mm extending into neural foramina was reported. Elective TS excision is planned by neurosurgery. Discussion: TCs are nerve root cysts found most commonly at the sacral spine arising between the endoneurium and the perineurium near the dorsal root ganglion. Sacroiliitis can be a manifestation of a wide range of disease processes. The coexistence of sacroiliitis and TC and their possible effects on each other is discussed. Conclusion: Based on our knowledge this is the first description of sacroiliitis and symptomatic TC coexistence. TCs are usually asymptomatic but they can rarely be a cause of chronic low back pain lumbar sacral radiculopathy and should also be considered in the differential diagnosis of sacroiliitis and inguinal hernia. Reprinted with permission.

No. 217 Psychological Characteristics of Patients With Complex Regional Pain Syndrome.
Koray Aydemir; Seher Yagmur; Bilin Lpsy; Ferdi Yavuz; Kutay Tezel (Gulhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey).

Disclosure: None. Objective: Complex regional pain syndrome (CRPS) has often been hypothesized to have a relation with psychopathological predisposition because of its enigmatic features. We aimed to investigate the personal and psychological characteristics of CRPS patients. Design: Cross-sectional data. Setting: Tertiary care university hospital. Participants: 21 subjects with upper extremity CRPS were included. Interventions: Not applicable. Main Outcome Measures: All patients were hospitalized and they were allowed to complete the questionnaire under the supervision of a psychologist before the treatment. Minnesota Multiphasic Personality Inventory (MMPI) was used to investigate psychological characteristics of the patients. MMPI is the most widely used standardized psychometric test of personality and psychopathology. All of the subjects completed the questionnaire. Demographic and clinical characteristics were also recorded. Level of Evidence: Level 3. Results: One patient could not adapt to test. In seven conversion disorder, in four depression, in two hysteria, in two hypochondria, in one borderline personality disorder, in one anxiety disorder, in one paranoid psychosis, and in one psychological projection disorder was diagnosed. Only one patient was normal according to DSM-IV. Conclusions: We think that behavioural and emotional disturbances or life stressors predispose one to develop CRPS however some authors claim that psychological traits are the result rather than the cause of CRPS. Reprinted with permission.

No. 218 Chronic Low Back Pain in Parkinson’s Disease: A Controlled Study.
Erehan Ali Ozturk, MD; Ibrahim Gundogdu, MD; Koray Aydemir, MD; Fatma Aytul Cakel, MD (‘Diskapi’ Education and Research Hospital, Department of Physical Therapy and Rehabilitation, Ankara, Turkey); (Gulhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, Ankara, Turkey).

Disclosure: None. Objective: To evaluate the clinical features and frequency of chronic low back pain (LBP) among Parkinson’s disease (PD) patients and to compare with the control group. Design: Controlled study. Setting: Tertiary care university hospital. Participants: 66 PD subjects and gender/match 80 control subjects were included. Interventions: Not applicable. Main Outcome Measures: Chronic LBP presence, visual analog scale (VAS) for pain severity, Roland-Morris disability questionnaire (RMDQ), and Oswestry disability questionnaire (ODQ) were used. Level of Evidence: Level 3. Results: 39 male and 27 female PD subjects were studied. Mean age was 62±11.6 years; mean duration of the disease was 93 ±86.1 months. LBP frequency when compared with the control group (22.5%) was significantly increased in PD group (54.5% p<0.001). Pain severity which was assessed by VAS was 63±23 mm in PD group and 50±15 mm in control group (p=0.033). RMDQ and ODQ scores were, respectively, 55±20.2% and 15±6.8 in PD group and 40.8±17.9 and 8±3.5 in control group (p values were 0.013 and 0.001 respectively). Conclusions: Chronic LBP in PD is a common and important cause of disability. Routine evaluation for LBP should take place in management for reducing disabilities among PD patients. Reprinted with permission.

No. 219 Intradiscal Steroid Injection to Treat Patients With Neuropathic Pain Due to Discogenic Low Back Pain.
Koray Aydemir; Ferdi Yavuz, MD; Mehmet Ali Taskaynatan (Eltimesgut Military Hospital, Ankara, Turkey).

Disclosure: None. Objectives: To investigate the effectiveness of intradiscal steroid injection in the treatment of discogenic low back pain (DLBP) with neuropathic pain (NEP). Design: Prospective-cohort study. Setting: Tertiary level hospital. Participants: 18 patients with DLBP were divided into two groups. Group 1 included 11 patients who had DLBP without NEP, and group 2 included 7 patients who had DLBP with NEP. Interventions: Not applicable. Main Outcome Measures: Duration and intensity of LBP, the Quebec Back Pain Disability Scale [QBPD], the daily sleep interference scale [DSIS], and a Leeds assessment of neuropathic pain questionnaire (LANSS) were used. Level of Evidence: Level 3. Results: 38.8% of the patients had DLBP with NEP whereas 61.2% had mainly nociceptive pain. As we investigated the mean changes of the QBPD scores and intensity of LBP in patients with a LANSS score ≥12 a statistically significant reduction was found at the second week and third month after the treatment compared to pre-injection values (p<0.05). The mean reduction in the intensity of DLBP the QBPD scores and the DSIS scores from baseline to second week and third month after the treatment was greater in group 2 than in group 1. However there was no significant difference in the mean reduction of the outcome parameters between the two groups (p>0.05). Conclusion: The present results showed that intradiscal steroid injections provided significant reduction in the QBPD scores and intensity of LBP in patients with NEP due to DLBP. Intradiscal steroid injections appear to be an effective and promising treatment for NEP component in DLBP. Reprinted with permission.

Koray Aydemir; Ferdi Yavuz, MD (Eltimesgut Military Hospital, Ankara, Turkey); Umut Guzelkucuk; Arif Kenan Tan.

Description: The patient was admitted to our department with severe neck pain and headache which had been lasting for 4 weeks. Brain CT was normal and cervical X-ray showed cervical spondylosis. Cervical MRI revealed spinal stenosis at C5-C6 intervertebral disc level. Neurologic exam was normal. 15 sessions of electrotherapy and exercises were applied but her complaints did not resolve. As we questioned the patient carefully, persistent pain and stiffness affecting both shoulder and pelvic girdles were detected. Morning stiffness was lasting more than an hour. Erythrocyte sedimentation rate (ESR) was 60 mm/hr. Based on these findings, PMR diagnosis was given. Low-dose prednisolone (10 mg/day) was begun. Prednisolone led to significant clinical improvement after the 4th day of the treatment. ESR was 25 mm/hr at the 10th day of the treatment. The patient had continued prednisolone treatment for 6 months. Discussion: In this case report we aimed to present an elderly patient who had diagnostic challenge for PMR. We wanted to emphasize that the pathological finding on MRI can not always be the cause of the patient’s pain. Clinical examination can sometimes be more valuable than diagnostic images. Conclusion: Clinicians should keep in mind PMR diagnosis in old patients with cervical pain and headache who do not respond to conservative treatments. Patients should be asked whether they have shoulder/pelvic girdle pain and morning stiffness. Reprinted with permission.

No. 221 Lumbar Disc Herniation in a Gymnast: A Case Report.
Koray Aydemir; Yasin Demir; Umut Guzelkucuk; Evren Yasar.

Setting: 200-bed rehabilitation center. Patient: A 22-year-old man with low back pain. Case Description: He was admitted to our hospital with low back pain. He claimed that he had been enrolled in intense gymnastic lessons for the last two years. Visual analog score (VAS) of low back pain was 80 mm. On physical examination the movement of the lumbar sacral spine was painful and 1/4 restricted. He reported reproduction of pain at 30 degrees for right while straight leg raising test. In the manual muscle testing of both upper and lower extremities, sensation examination and deep tendon reflexes were normal. Assessment/Results: Laboratory tests were normal. Magnetic resonance imaging (MRI) showed a large extrusion of the L5-S1 disc accompanied compression of right L5 nerve root. We administered a treatment consisting of electrotherapy, physiotherapy and tender points. VAS of pain was decreased to 30 mm after the treatment. Discussion: It should always be kept in mind that sports or positions which are challenging lumbar spine like gymnastics may cause intervertebral disc overloading and may trigger lumbar disc diseases.

No. 222 Assessment of Quality of Life, Sleep, and Mood After Step Increase in Analgesic: Prospective Study.
Idoya Barca Fernandez; Ana Rodriguez Gonzalez; Rocio Martinez Arribas; Rocio Vacas Mata.

Objective: Evaluate how it affects the improvement in pain intensity on quality of life, sleep, and mood. Design: Prospective study. Variation in the quality of life, sleep quality, and mood and their correlation with improved pain control is studied (considering as such the decrease of at least 2 points on the numerical scale of pain intensity) after three months. Location: Primare Care University Hospital, Madrid, Spain. Participants: 15 patients who come to consult with chronic pain (> 6 months) uncontrolled (ENID > 5) with the usual medication. Age 80% 65 ± 12.3 years old. 47% back pain, knee pain 33%, 20% painful shoulder. 3 ± 2.6 years of evolution. Prior analgesic treatment: first analgesic step, 53.3%; second analgesic step, 46.7 patients. Assessment: Optimizing pharmacologic treatment by raising the patient’s prior analgesic step. Main Outcome Measures: Linear correlation (< 0.05), changes in the level of pain and quality of life and sleep. Study variables: sex, age, cause of pain, duration of prior analgesic treatment, prescribed treatment score on the numerical scale of pain intensity (ENID) questionnaire on the quality of life (EUROQ5D), the sleep quality (MOS scale), and mood (Rank Beck). Evidence level: 2 Results: ENID initial: 8 (1.7) at 3 months: 5.4 (2.7) p < 0.001. EUROQ5D initial: 5.5 (2.2) at 3 months: 3.8 (2.9) p < 0.001. MOS: initial: 11.5 (4.2) at 3 months: 9 (4.8) p < 0.001. Beck: initial 10.5 (3.6) at 3 months: 8.4 (6) p < 0.001. Conclusions: There is a clear association between improvement in pain intensity and quality of life and sleep and mood. In the third step analgesic better control of the quality of life and mood were observed.

No. 223 Case Report of Woman With Severe Refractory Thoracolumbar Pain: Evaluation and Treatment.
Idoya Barca; Concepcion Cuenca; Adriel Cuevas; Miguel Anchango.

Setting: Clínico San Carlos Hospital Rehabilitation Service. Patient: 76-year-old patient with a history of type II diabetes mellitus and hypertension. Osteoporosis diagnosed in 2007 after trauma resulting in right Colles fracture and a domiciliary falling resulting in D10 vertebral compression fractures. Baseline condition: BADL. Risk of a 3 point fracture and a chance of hip and vertebral fracture in the next ten years of 16.4% and 24.7%, respectively. Case Description: Patient comes due to severe thoracolumbar pain, difficulty walking, inability to perform activities of daily living and personal care. Pre densitometry to lumbar T-score: -2.7 hip -1.4. Frax index: 8.8%. RX: Acute fracture D9. Assessment: Postural advice and nutritional tips are provided, light aerobic exercise, and resistance exercises. Second step analgesia and PTH regimen. Basic analytic control and bone markers in blood and urine quarterly. Post-treatment densitometry: lumbar T-score: -2.4 hip -1.2. Discussion: After treatment states a decrease in pain (VAS of four points) and an improvement in quality of life. Markers of bone remodeling remained increased compared with baseline after 18 months and significantly improved densitometry. Conclusion: Early diagnosis of osteoporotic vertebral fracture is very important in postmenopausal women because it is associated with increased risk of new fractures, increased morbidity, increased mortality, and impaired quality of life. Markers of bone remodeling help us identify women with risk of fracture and provide additional information to the DMO.

No. 224 Vertebral Affectation for Osteoid Osteoma Lumbar Pain With Gait Disturbance.
Idoya Barca Fernandez; Concepcion Cuenca Gonzalez; Ana Maria; Herranz Torrubiano; Maria Fernandez Benzalear Cantalejo.

Location: Hospital Clinic, San Carlos, Madrid, España. Disclosure: None. Setting: Regional hospital and national reference. First level hospital. Patient: 11-year-old male patient with scoliosis and gait disturbance. Case Description: Patient derived from orthopedic surgery department due to lumbar pain radiates to right iliac crest and left lumbar scoliosis. Case studied in neuroepidemiology unit because presyncope and gait disturbance. Physical examination: asthenic habit. Pain in apophysis of L4-L5 vertebrae with tenderness at the right paravertebral muscles and increase volume of right square muscle. Slope shoulder and right scapula (>left) asymmetry, waist (left:right) pelvic imbalance due to flexed left knee. Adams test: left lumbar hump (irreducible with slight bending test) and slight rib hump. Significant gait disturbance with clockwise rotational component of the pelvis and leg in flexion and internal rotation. Upper limb hypermobility, femoropopliteal angle about 130 degrees bilateral. Finger-ground distance 30 cm. Teleradiography column: deviation right thoracic angle of 27º Cobb (T1-T6), deviation left lumbar angle of 30º Cobb (L1-L5). Riser 0. Results: Thoracolumbar TC presented an 8 mm lytic lesion in right pars interarticularis of L4 vertebra with sclerosis around the same suggestive with osteoid osteoma. Discussion: After clinical session with the orthopedic surgery department treatment with percutaneous electrocoagulation radiofrequency was undertaken to complete destruction of the nidus and orthotic treatment with Boston brace. Conclusions: Scoliosis is asymptomatic in children and adolescents. If the pain is present in spine, there is a significant gait disturbance, rigidity, and low reducibility of the deviation of spinal curves in the exploration we should carry out complementary diagnostic test to search secondary causes.
No. 225 Enfermedad De Baasstrup: Lumbalgia Mecánica Crónica.
Idoyar Barca Fernandez; Concepcion Cuenca Gonzalez; Maria Fernanda; Berzal Cantalejo; Ana Maria Herranz Torrubiano.

Location: Hospital Clinic, San Carlos, Madrid, España. Disclosure: None. Setting: Regional hospital and national reference. First level hospital. Patient: Paciente de 83 años con lumbalgia mecánica progresiva de años de evolución sin clínica de claudicación ni atrapamiento radial oculto derivada desde reumatología. Case Description: Antecedentes personales: no alergias medicamentosas conocidas HTA dislipemia hipotension diabetes mellitus no insulin dependiente síndrome depresivo polimialgia reumática con afectación periférica y osteopenia. Tratamiento farmacológico con inmunosupresores (métrotexate) calcio vitamina D. Resultados: Exploración física: apofisalgias lumbares bajas con leve dolor muscularata paravertebral bilateral. Dolor a la extensión columna lumbar. Lasseque braggard y puntos cáticos negativos. Desnivel pélvico derecho que compensa con alza de 1 cm. Marcha en punta y talones conseguida con ayuda de una persona por inestabilidad. Resto de la exploración normal. RX columna lumbar: severos cambios degenerativos con disminución de los espacios intervertebrales a diferentes niveles osteofitos anterolaterales muy prominente y afectación degenerativa severa de las articulaciones interapófisis lumbares bajas compatible con enfermedad de Baasstrup. Results: Tras su valoración se pauta tratamiento con magnetoterapia y ajuste tratamiento farmacológico analgésico así como medidas higiénico posturales (disminución dolor con la flexión empeoramiento con la extensión) con mejoría de la clínica (eva inicial 6/ final 2; Oswestry disability test inicial 42/ final 19%). No se realiza influencia de antecesos locales entre apófisis dolorosas ni resección parcial de las apófisis espinosas dada la edad de la paciente. Discussion: la enfermedad de Baasstrup es una causa poco conocida de dolor lumbar con afectación degenerativa de la apófisis espinosas (L3-4 y 14-15) y formación de una pseudoarticulación entre las apófisis espinosas lumbares y rotura-degeneración del ligamento interespinoso a menudo asociada a una hiperlordosis lumbar. Conclusions: La enfermedad de Baasstrup debe sospecharse para poder ser diagnosticada. Se localiza en línea media se reproduce con la palpación y se excarca con la.

No. 226 Efficiency of the Blockade Paraespinoso and Dry Agujamiento in Low Back Pain Treatment at Police.
Astrid Cecilia Bernaola Cuadros; Leonid Richard Bernaola Cuadros (Hospital, Lima 2011).

Objective: To determine the therapeutic efficacy of paraespinoso blockade and dry agujamiento in treating low back pain in patients at the Police Hospital, Lima 2011. Design: Study type: observational, descriptive, retrospective cross. Demographic data were collected and therapeutic medical records of patients who received paraespinoso blockade and dry agujamiento 1-4 sessions LNS, PNP hospital during the period from February to July 2011. Location: Hospital De Police Lima, Peru. Participants: 112 patients; male (n = 56) and female (n = 56). Intervention: Not applicable. Level of Evidence: Level 1. Main Outcome Measures: Visual analog scale (EVA) of safety, percentage of subjects able to learn the skills, the time required, and subjective difficulty scores (EVA 0: success (no pain); EVA 1-3: better; EVA > 4: failure). Results: Of 112 patients 50% had received paraespinoso blockade 28.6% treatment success EVA: painless, 64.3% improvement EVA: 1-3. In dry agujamiento improvement was obtained in 92.9% with EVA 1-3, and in both methods of treatment the percentage of failure is no predominance 7.1% according to sex. Paraespinoso blockade pain relief: 7.1% in one session, 21% in four, 42.9% and 28.6% in three and four, respectively. In dry agujamiento: 78.6% in three sessions and 21% in four, pain relief not being obtained in first and second sessions. Conclusions: Paraespinoso blockade is effective short-term in relation to dry agujamiento to reduce the prevalence of moderate to severe low back pain. Therapeutic success was observed from the first session compared to the third session of pain relief with dry agujamiento. This type of treatment can be applied to other health facilities nationwide.

No. 227 Proposal of a New Physical Therapy Scheme for Assessment and Rehabilitation Treatment of Systemic Nephrogenic Fibrosis: A Case Report.
Camacho Honorio Arroyo Galo Eduardo; Nakazato Nakamine Tomás Saneo.

Patient: 65-year-old woman with systemic nephrogenic fibrosis (SNF). Case Description: Patient with severe generalized pain and mobility restriction despite drug treatment with opioids adjuvants and local anesthetics. We proposed a scheme for assessment and rehabilitation with 6 key features: 1) pain, 2) joints range of movement (ROM), 3) muscle strength (MS), 4) sensitivity and proprioception (SSP), 5) activities of daily living, walking, and moving (ADLWSM), 6) complications. Initial assessment (ICF codes in parenthesis): 1) VAS 10 (B280 4), 2) mean ROM 48.7% (B710.3), 3) mean MS 3 (B730 3), 4) SSP altered (B265.2 B260.2), 5) ADLWSM complete difficulty (caring for body parts D520.4, dressing D540.4, eating D530.4, walking, and moving D469), 6) no complications. Physical therapy treatment (PTT) prescribed: 1) pain management: thermotherapy and TENs, 2) improve ROM: passive and active-assisted mobilizations, 3) improve MS: isometrics, 4) improve SSP: textures, stimulation, 5) improve ADLWSM: exercises for the upper extremities, 6) prevent complications: respiratory exercises and skin care. Results: Final assessment after 36 sessions of PTT 3 times/week: 1) VAS 9 (mild improvement B280 3), 2) ROM 73.3% (good improvement B710.2), 3) FM equal, 4) SSP equal, 5) mild improvement in some ADLWSM activities (D550.3, d469.3), 6) no complications. Discussion: SNF is a rare condition presented in patients with chronic kidney failure in dialysis exposed to gadolinium for IRM studies. They develop pain and progressive loss of mobility. To our knowledge, this is the first report of PTT for this condition and using the proposed scheme the patient improved in 3 of the 6 features evaluated (pain, ROM and ADLWSM) with the remaining 3 maintained without deterioration. Conclusion: PTT improved the condition of this patient with SNF. The use of this new scheme allowed us to arrange a careful assessment and treatment with greater objectivity in the evaluation of the rehabilitation outcomes.

No. 228 230 Therapeutic Effects of Intraarticular Injection With Botulinum Toxin Type A in Advanced Gonarthrosis.
Carmen Eudelia Cortés Corral; Lilia Isabel; Correa Méndez; María Yolanda; Zambrano Muñoz; Alejandra Méndez Gómez.

Objective: To test the hypotheses that the use of intra-articular injection with botulinum toxin type A on the knee has therapeutic effects for pain management in advanced knee osteoarthritis. Design: Quasi-experimental study. Setting: Pain management in advanced knee osteoarthritis. Participants: 39 patients from the Rehabilitation Department in Centro Médico de Occidente with knee osteoarthritis grade 3 and 4 according to the Kellgren-Lawrence classification were recruited. Interventions: 100 units of botulinum toxin type A were reconstituted in 1cc of saline solution. Patients received an injection with a unique dose in one point at the affected knee joint. Main Outcome Measures: Patients were evaluated before, and 4, 8, and 12 weeks after the application and were assessed with the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), pain visual analog scale (PVAS), relief scale (RS), goniometry (GM), and the time up and go test (TUG) at each valuation. A statistical analysis was performed with the SPSS program v. 20.0. Results: Within the 39 studied patients 28.2% were among 66-70 years old corresponding to the highest frequency with a Kellgren-Lawrence scale where the majority were grade 3. 67% of the patients were female, and 97% of the subjects were diagnosed with obesity and overweight. Improvement was analyzed with PVAS and RS showing pain reduction when comparing the initial (14.2 ±16.8) with the final measure (25 ± 17.2) score with a p value <0.001. Measuring functional status was performed by WOMAC, TUG, and GM.
through t Student we observed p <0.001 comparing initial and final status in all scale scores. Conclusion: Intra-articular injection with botulinum toxin type A is a therapeutic option for pain management in patients with advanced knee osteoarthritis.

No. 231 Connotative Meaning of the Concepts of Lumbago and Sciatica in Patients With Chronic Lumbar Pain Through a Model of Natural Semantic Network (RSN). Eva Cruz Medina; Roberto Coronado Zarcos, MSc; Salvador Israel; Macías Hernández; Aurelia Arellano Hernández.

Objective: To identify the connotative meaning of “lumbago” and “sciatica” with a RSN in patients with lumbar spine pathology. Design: Cross sectional study. Settings: Servicio de rehabilitación de columna México Distrito Federal. Participants: A total of 203 surveys were applied to the service patients. 111 women and 93 men, with a mean age of 44.4 years. Main Outcome Measures: In the survey were provided in the stimulus “lumbago” and “sciatica” words and asked patients to relate to 5 other words from arbitrarily form and then rank them in order of importance. Frequency of mention (J) was determined group consensus (C10), semantic memory association, semantic weight (M), and percentage of defining words. Results: Value:J = 164 for lumbago, 195 for sciatica. C10: 33.1 for lumbago, and 26.9 for sciatica. Value: M. lumbago (pain 173, spine 623, back 466, discomfort 405, lumbar 269), sciatica (pain 1373, nerve 947, leg 560). Median: 14.6 lumbago 18Sciatica. Range: 9.2-86.2 lumbago / sciatica 14.7-119 (p = 0.315 U = 36). Lumbago PV / S (median 14.4/13.8 rank 10.8-88.3/8.9-86.6 (p = 0.684; U = 44) sciatica PV / S (median 7.4/6.5 rank 1.4/1.5-1.42.1 (p = 0.436 U = 39). Conclusion: There is no difference in the conceptualization of the terms. To modify this conceptualization emphasizing patient education will promote behavioral changes that improve adherence to treatment.

No. 234 Thoracic Vertebral Fracture After a Back Massage: A Case Report. Ayca Uran; Yasin Demir; Umut Guzelkucuk; Koray Aydemir.

Setting: 200-bed rehabilitation center. Patient: A 59-year-old man with back pain Case Description: A 59-year-old patient presented to our hospital with complaints of acute back pain. He stated that his pain had started the day after a massage therapy. There was no history of trauma or falls. Physical examination demonstrated normal range of motion of the cervical and lumbar spine. Tenderness was detected over the paraspinal muscles and the spinous processes of vertebrae from T5 to T7 levels on palpation. Assessment/Results: Routine laboratory tests revealed a creatine kinase (CK) level of 536 U/l. The serum concentration of C reactive protein (CRP) was 10.3 mg/dl, and the erythrocyte sedimentation rate was 30 mm/h. X ray examination was normal. Topical analgesic was prescribed and physical therapy programme VAS pain score was decreased from 100 mm to 30 mm. Discussion: Fracture is a serious and rare complication of the pulmonary processes of vertebrae from T5 to T7 levels on palpation. The conservative treatment included physical therapy programme VAS pain score was decreased from 100 mm to 30 mm. The treatment included included physical therapy programme VAS pain score was decreased from 100 mm to 30 mm. Conclusion: Fracture is a serious and rare complication of the thoracic vertebrae fracture at the level of T7. The conservative treatment included physical therapy programme VAS pain score was decreased from 100 mm to 30 mm. The diagnosis should be confirmed by clinical and radiological assessments.

No. 237 Patients With Degenerative Spondylolisthesis Who Chose to Have Surgery Had Significant Instability and More Fatty Infiltration in Erector Spinae. Sibel Demir-Deviren; Emerl Ece Ozcan-Eksi; Sigurd Berven; Jeffrey Lotz.

Disclosure: None. Objective: To determine the effect of Modic 1 changes on the clinical outcomes in subjects with disc herniation (DH) who underwent lumbar discectomy. Design: Prospective cross-sectional study on prospectively collected data. Setting: UCSF Spine Center. Participants: Nine-teen subjects (mean age 39.08±9.66 years) with DH: 1) 7 subjects with Modic 1, 2) 12 subjects without Modic changes. Main Outcome Measures: We measured visual analogue scale (VAS) and Oswestry disability index (ODI) before and 6 months after the surgery. Modic changes were evaluated on the MRI. Level of Evidence: II. Results: The groups were similar in age and gender (p>0.05). The subjects without Modic changes (44.66±21.66) were more disabled than those with Modic 1 (24.57±13.45) at baseline (p=0.023). The subjects with Modic 1 had significantly more improvement in pain (70.75%) than subjects without Modic changes (29.30%) (p=0.010). The subjects with Modic 1 (62.54±48.84%) had more improvement in disability than those without Modic changes (-2.03±8.26%) even though it was not statistically significant. Two subjects (28.57%) with Modic 1 developed discogenic pain with Modic 1 without reherniation 33 months after surgery. One of them underwent fusion at the level of the discectomy. One subject without Modic changes (8.33%) developed reherniation in 4 months and underwent discectomy. Conclusions: Subjects with Modic 1 had more improvement in pain than subjects without Modic changes at 6 months after the surgery even though subjects without Modic changes were more disabled at the baseline. However more subjects with Modic 1 developed discogenic pain after discectomy comparing to subjects without Modic changes. Further prospective studies need to be done to find out the effect of Modic 1 bone marrow changes on the prognosis of disc herniation and discectomy.

No. 240 Is It Worthwhile to Measure Bone Quality in Patients With Adolescent Idiopathic Scoliosis. Du Qing; Zhou Xuan; Chen Peijie.

Objective: The objectives of this study were to compare bone quality (speed-of-sound [SOS] and Z-scores) between female adolescent idiopathic scoliosis (AIS) patients and controls using quantitative ultrasound examination. Design: Controlled study. Setting: Teaching tertiary general
hospital. Participants: 88 female AIS patients and 58 healthy female controls from 10 to 16 years of age were included. Interventions: Not applicable. Main Outcome Measures: Quantitative ultrasound measurements were performed at the left distal end of the radius, and the standard method to estimate SOS was recorded. Z-score was then calculated. Level of Evidence: Level 2. Results: The SOS values of 88 female AIS patients were significantly lower than age-matched adolescent controls (p < 0.01). However, there was no statistical correlation between bone density and types of scoliosis as well as family history (p > 0.05). The SOS values among different severity groups of curvature were found to be significant, particularly between 10 to 20 degrees and 20 to 40 degree groups, but there was no significant correlation between SOS and Cobb angles. Statistically significant correlations were also found between pre- and post-menarche status. There was significant difference in the SOS values in different Risser stages (p < 0.05) and more osteopenic immature patients were more osteopenic. Conclusions: Female AIS patients have generally lower bone quality measured by quantitative ultrasound. Slower maturation may be one of the factors that affect the bone quality in these patients. Different types of scoliosis and family history have no effect on the bone quality in these patients. Although there were significant differences between SOS values and Cobb angles, this may be due to slower bone maturation than the severity of the AIS curve. It is recommended that quantitative ultrasound measurement should be undertaken in AIS patients.

No. 242 Predictors of an Unfavorable Intermediate and Long-Term Outcome After First Time Lumbar Disc Surgery. Ebenbichler Gerold; Safron Nora; Koenig Franz.

Aim: To identify among several clinical, biometrical, and psychosocial variables those that would best predict an unfavorable functional outcome 1.5 and 12 years after first time lumbar disc surgery in patients who suffered from an acute or subacute preoperative onset of complaints that led to the operation. Study Design: Prospective observation of a cohort that had participated in a RCT. Setting: Outpatient department of PMR. Patients: A total of 99 and 78 patients who underwent first-time disc surgery and participated in follow-up assessments 1.5 and 12 years later. Interventions: At baseline demographic, biometric, functional, and psychosocial variables were assessed. At both of the follow-up examinations, patients’ back-related functional health was examined using the validated “Low Back Pain Rating Scale” (LBPRS; Manniche 1994). Main Outcome Measures: A score exceeding 19.5 points on the total LBPRS and one exceeding 4.5 points on the LBPRS disability subscale were defined as unfavorable outcome. Level of Evidence: 1. Results: Unfavorable outcomes were registered in 50.5% of the patients at 1.5 years and in another 52.6% 12 years after surgery. Out of a total of 43 potential predictors investigated, 7 were able to presage the intermediate term and 4 variables the long-term outcome. “Physical activity status” and “pain intensity in the first week after surgery” were those variables that predicted an unfavorable outcome at both 1.5 and 12 years after surgery. Conclusions: Low physical activity levels and perception of severe pain immediately after surgery negatively impact postoperative outcome after lumbar disc herniation. Management of patients identified with these risk factors should include optimized postoperative pain management and comprehensive rehabilitation.

No. 244 Validation of the Turkish Version of the Fear Avoidance Belief Questionnaire. Ketencli A; Kesiktas N; Sindel D; Disci R.

Objective: Anticipated pain and fear avoidance beliefs that seemed to be cause of prolonged work loss, joblessness, and chronic disability have been suggested as important factors for the classification and treatment outcome of patients with LBP. The objective of this cross-cultural adaptation study was to assess the reliability and validity of the Turkish version of the Fear Avoidance Belief Questionnaire (FABQ TR). Participants and Method: The questionnaire was tested in two groups of 30 and 150 patients with chronic low back pain. The Fear Avoidance Belief Questionnaire was translated into Turkish. Test-retest reliability was assessed in 30 patients. Construct validity was assessed in 150 patients. Results: Test-retest reliability was high with an intraclass correlation coefficient value of 0.85 for fear avoidance belief about work, 0.82 for fear avoidance belief about physical activity, and 0.88 for fear avoidance belief total. Four factors were extracted which accounted for 65.58% of the total variance. Factor 2 was the same as the one extracted in the original version and represents attitudes and beliefs about physical activities. Factors 1, 3, and 4 represent attitudes and beliefs about professional activities. Factor 1 beliefs about ability to return to work, factor 3 represents fear of work activities, and factor 4 beliefs about the responsibility of work with chronic symptoms. Conclusion: FABQ TR has sufficiently good psychometric properties to be used to assess fear avoidance attitudes and beliefs in Turkish-speaking patients with low back pain.

No. 245 The Effectiveness of Therapeutic Ultrasound in Non Specific Mechanical Cervical Pain and Comparison of Different Application Methods for Clinical Practice. Aysegul Kefenci; Ozgur Cellik; Sina Esmailizadeh; Dilsad Sindel.

Objectives: The aim of this study was to investigate the effectiveness of therapeutic ultrasound (US) in non-specific mechanical neck pain and to compare the effects of intermittent and continuous US applications on pain severity and functional disability. Materials and Methods: 71 patients aged between 18 and 65 with non-specific mechanical neck pain suffering for less than three months were included in the study. After the baseline measurements, patients were randomized to three physical treatment groups. US was applied intermittently in the first group, continuously in the second group, while the third group received sham US application during 10 sessions. Three groups were also treated with TENS. Patients were evaluated by visual analog scale, algometer, neck disability, and goniometer. Control measurements were three months later after therapy. Results: Pain severity was improved statistically significant in three groups three months later after therapy (p<0.001). Pain pressure threshold (PPT) was increased statistically significant in the first and second group after the treatment (p<0.005), while PPT was decreased in control group. Three months later after therapy, PPT was increased statistically significant in all of three groups (p<0.005). Continuous US was observed more effective than intermittent application in cervical rotation range when the groups were compared after the physical therapy sessions. Continuous application was observed more effective when the group were compared in terms of functional recovery. Conclusions: Therapeutic US applications are effective in reducing the severity of pain; furthermore it affects the functional status positively by increasing cervical range of motion.

No. 246 Reliability of Isometric Trunk Moment Measurements in Chronic Low Back Pain Patients. Thomas Kienbacher; Philipp Anders; Josef Kollmitzer; Gerold Ebenbichler.

Disclosure: None. Objective: To determine the short- and long-term reliability of maximum isometric trunk moment measurements in chronic low back pain patients older than 50 years of age and to compare the results with those from younger patients. Setting: Prospective cohort study. Setting: Outpatient rehabilitation clinic. Participants: 73 older patients (42 females; 50-90 years) and 82 younger patients (41 females; 18-49 years). Main Outcome Measures: Maximum isometric trunk extension, flexion, and rotation torques were evaluated for age- and gender-specific groups. Re-test-reliability was assessed with intraclass correlation coefficient (ICC21), standard error of measurement, and smallest real difference (absolute and in percent). Patients performed maximum isometric trunk extension, flexion, and rotation. They repeated the tests after 1-2 days (short-term) and after 6 weeks (long-term). Results: For the older groups, smallest real differences in extension and flexion torques varied up to 31% and were similar to those obtained from younger groups. Precision of the trunk rotation tests was lower in all groups tested. Re-test agreement (ICC21) was high for all tests without differences between gender- and age-specific
groups. Neither patients' motivation nor their anticipatory emotions correlated with the individual coefficients of variation of the trunk muscle moment measurements. Conclusion: Isometric maximum trunk muscle moment measurements derived from chronic low back pain patients older than 50 years are as reliable as those derived from younger patients of the condition. These measurements enable an acceptable level of detection of expected muscle torque changes in these patients. Reprinted with permission.

No. 247 Patient-Tailored Multimodal Rehabilitation Intervention is Necessary When Treating Cervical Neuromuscular Syndrome After Traffic Accidents.
Yoichiro Kikuchi; Hideki Yumikake; Shiro Hanakawa; Naoya Kobayashi.

Objective: Cervical neuromuscular syndrome (CNMS) is an autonomic imbalance caused by neck muscle abnormalities. Cervical sprain (whiplash-associated disorders) following traffic accidents is a major cause of CNMS. So-called general malaise is a major somatic symptom and psychiatric symptoms such as depression may develop with disease progression. We aimed to demonstrate that multimodal rehabilitation intervention is extremely effective for treating CNMS. Design: Case-control study. Setting: Therapeutic interventions were provided at a rehabilitation center of the 11th Peel general hospital in Japan from July 2012 to November 2013. Okayama City (population: 701,629) had 8709 traffic accident-related casualties with 33 deaths in 2012. Participants: From among the 2585 individuals who underwent rehabilitation intervention, 557 patients who had sustained traffic accidents were included in this study. Of these 557 patients, 92 were diagnosed with CNMS and underwent therapeutic intervention and 386 underwent therapeutic intervention by physicians who were unaware of CNMS in other departments. Interventions: Symptomatic treatments included oral medications, fluid replacement, intravenous injections, and Botox injections along with physical therapy including low-frequency electrotherapy and hot packs. We also conducted systemic adjustment training centered on muscle relaxation using a combination of physical and occupational therapies. Main Outcome Measures: A questionnaire with 30 yes/no questions was used for indefinite complaints. The presence of more than 5 symptoms required treatment. Assessments were performed before and after treatment. Treatment was considered effective if more than 1 symptom improved. Results: Sufficient effects were achieved with drugs and physiotherapy apparatus alone in 57.6% of patients and effects were seen in >90% of patients by the combination of physical and occupational therapies. Some patients markedly responded to Botox therapy and some returned to labor-intensive work after temporary leave. Conclusions: Patient-tailored and appropriately-timed rehabilitation intervention is effective for treating CNMS and could reduce unnecessary tests drugs and medical expenses.

No. 248 Relationship Between the Type and Amount of Physical Activity and Low Back Pain in Koreans Aged 50 Years And Over.
Won Kim.

Objectives: To examine the association between the type and amount of PA and LBP in people aged 50 years and over. Design: Cross-sectional study. Setting: A nationwide survey. Participants: Data were obtained from the fifth Korea National Health and Nutrition Examination Survey which was conducted in 2010 and 2011. Overall 1796 men and 2198 women aged 50 years and over were included. Interventions: PA was categorized as vigorous moderate walking, strength exercises, or flexibility exercises. The total amount of PA was presented as quartiles of the total metabolic equivalent (MET)-min/week based on the PA questionnaire. Multivariate logistic regression analysis was performed to examine associations between LBP and the type and amount of PA. Main Outcome Measurements: Odd ratio for low back pain according to the type of physical activity and the quartiles of the total MET-min/week. Level of Evidence: Level 1 evidence. Results: After adjusting for age and body mass index, vigorous and moderate PA were associated with an increased risk of LBP in both men and women, whereas strength exercises were associated with a reduced risk of LBP. These associations were maintained after adjusting for all potential confounders. Subgroup analysis according to age revealed that these trends were most significantly demonstrated in women aged 65 years and over. The PA quartiles for total MET-min/week for men showed a U-shaped association with LBP, whereas only the fourth PA quartile for women showed an increased risk of LBP compared with the second quartile. Conclusions: These results suggest that both the type and amount of PA affect the development of LBP in people aged 50 years and over. Thus activity modification might be helpful for prevention and management of LBP.

No. 249 Diagnostic Effectiveness of Electrodiagnostic Study and Ultrasound in Sural Neuroma.
Joon-Sung Kim; Hye Young Han, MD; Seong Hoon Lim; Bo Young Hong.

Disclosure: None. Setting: University Hospital. Patient: A 52-year-old man with numbness of leg Case Description: A 52-year-old man referred for electrodiagnostic evaluation to rule out lumbosacral radiculopathy. He complained of lower back pain and numbness of left posterolateral calf and lateral aspect of the foot. He underwent surgical tendon repair due to traumatic laceration from car accident in 1991. He had impaired light touch and pinprick sensation over the left posterolateral calf area from 14cm proximal of the lateral malleolus to the lateral aspect of the foot including fifth toe. Electrodagnostic studies were performed. The left sural nerve was stimulated 14cm proximal to the lateral malleolus, recording was made in just posterior to the lateral malleolus. Recognizable response was not recorded following stimulation at 14cm, 12cm, and 8cm proximal to the lateral malleolus. The right sural nerve was not obtainable due to amputated state. An ultrasonographic study (US) was performed using a linear electronic 10-13 MHz probe at 14cm proximal to the lateral malleolus through transverse and longitudinal scans. US findings showed regular oval and hypoechoic mass at the site. Magnetic resonance imaging (MRI) showed a segmental thickening with perineural fibrosis of sural nerve and local muscle herniation in soleus. The patient had surgical exploration and a fusiform like sural neuroma was found at the site of surgical wound. After excision of neuroma his symptom disappeared. Conclusion: We report this case owing to its rarity and to emphasize the diagnostic effectiveness of the combination of electrodiagnostic study and US when sensory nerve action potential is not evoked.

No. 251 Effectiveness of Teriparatide Treatment on Back Pain and Quality of Life in Patients With Severe Osteoporosis.
Hikmet Kocyigit; Bengi Ozoglu Oz, MD Assoc. Prof.; Guzide Gonca Oruk.

Disclosure: None. Objective: Patients suffering from osteoporotic vertebral fractures often have impaired physical function and limited daily living activities due to back pain. We aimed to evaluate the effectiveness of teriparatide treatment on the back pain and quality of life in severe cases of osteoporosis. Participants: We retrospectively reviewed 12 osteoporosis patients treated with teriparatide. All the patients had at least two vertebral fractures and T score <−4.0 at total hip or lumbar spine (L1-L4). Main Outcome Measures: Assessment of back pain was based on the visual analog scale (VAS). For quality of life measurements we used the QUAL-EFFO and the SF-36. Patients were clinically assessed at baseline and at 6, 12, and 18 months after teriparatide initiation as were weight, height, clinical complications, pain, and quality of life evolution. Results: Mean age of the patients (n=12) was 71.1±5.1 years and all of them were women. At all follow-up visits statistically significant improvements were observed in the pain domains of both QUAL-EFFO and SF-36 and also severity of back pain evaluated by VAS (p<0.05). At the 6-month follow-up visit mean QUAL-EFFO physical function and total QUAL-EFFO scores were significantly lower compared with the baseline scores. Additionally general health perception subscale score was also improved compared to baseline at 12 and
18 month follow-ups (p<0.05). Mean SF-36 physical role functioning and vitality scores were higher compared to baseline at all follow-up visits. The social role functioning and physical function domains of SF-36 showed significant improvement both at 6th and 12th month (p<0.05). Mean T scores for lumbar spine (L1-L4) and serum osteocalcin level were significantly higher when compared to baseline at the 12-month follow-up visit.

Conclusion: In elderly patients with severe osteoporosis, teriparatide treatment is effective in reducing back pain and improving physical function.

No. 252 The Effect of Depressive Emotional State on the Efficacy of Physical Therapy in Patients With Low Back Pain Syndrome.
Hikmet Kocyigit; Fatma Tezel Mayalatã, M.D.; Bengi Özoãýul Þz;ÖZlem Akayali Yoleri.

Disclosure: None. Objective: The aim of this study was to investigate the effect of depressive emotional state on the efficacy of physical therapy in patients with chronic mechanical low back pain (LBP). Design: Randomized controlled study. Participants: Sixty patients with chronic LBP were included in this study. The patients were evaluated by a psychiatrist according to the Hamilton depression rating scale (HAM-D) and separated into 2 groups regarding the cutoff score. Group 1 consisted of 31 patients with without depressive emotional state, while group 2 included 29 patients with depressive affect. Interventions: Infrared ultrasound and TENS were applied to both groups daily for 15 days. A home exercise program consisting of lumbar dynamic stabilization exercises was instructed.

Main Outcome Measures: Outcome measures included the visual analog scale (VAS), Oswestry disability index, and the short-form 36 (SF-36). Results: Pain intensity during daily activities at rest and sitting position was found to be significantly higher in group 2 at the 8th week. Oswestry scores at the 3rd and 8th weeks were similar in both groups when compared with scores obtained before treatment. However disability scores of group 2 were significantly higher than group 1 at the 8th week. All SF-36 subscale scores were lower in group 2 at the 3rd and 8th weeks after treatment. Conclusions: Patients with chronic LBP and a depressive emotional state are inclined to have more disability and poorer quality of life, and physical therapy and exercises yield to less improvement in pain and some parameters of quality of life in SF-36 in these patients than those without depressive affect. Evaluation of emotional state in patients with chronic LBP before initiation of physical therapy seems to be useful in the prediction of efficacy of treatment.

No. 253 Effectiveness of Teriparatide Treatment on Back Pain and Quality of Life in Patients With Severe Osteoporosis.
Hikmet Kocyigit; Bengi Ozogul Oz, M.D Assoc. Prof; Ä. Zmir Turkey; Güzide Gonca Oruk (Dept. of PM&R, Ä Zmir Katip Celebi University, Atatürk Research & Training Hospital).

Disclosure: None. Objective: Patients suffering from osteoporotic vertebral fractures often have impaired physical function and limited daily living activities due to back pain. We aimed to evaluate the effectiveness of teriparatide treatment on the back pain and quality of life in severe cases of osteoporosis. Participants: We retrospectively reviewed 12 osteoporosis patients treated with teriparatide. All the patients had at least two vertebral fractures and T score of >-4.0 at total hip or lumbar spine (L1-L4). Main Outcome Measures: Assessment of back pain was based on the visual analog scale (VAS). For quality of life measurements we used the Quality Of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO) and the SF-36. Patients were clinically assessed at baseline and at 6, 12, and 18 months after teriparatide initiation as were weight, height, clinical complications, pain, and quality of life evolution. Blood analysis including bone metabolism parameters and DEXA scanning were performed at the 12-month follow-up visit. Results: Mean age of the patients (n=12) was 71.1 ± 5.1 years and all of them were women. At all follow-up visits, statistically significant improvements were observed in the pain domains of both QUALEFFO and SF-36 and also severity of back pain evaluated by VAS (p<0.05). At the 6-month follow-up visit mean QUALEFFO physical function and total QUALEFFO scores were significantly lower compared with the baseline scores. Additionally general health perception subscale score was also improved compared to baseline at 12 and 18 month follow-ups (p<0.05). Mean SF-36 physical role functioning and vitality scores were higher compared to baseline at all follow-up visits. The social role functioning and physical function domains of SF-36 showed significant improvement both at 6th and 12th month (p<0.05). However no significant differences were found with regard to emotional subscale scores of the QUALEFFO and SF-36 at all follow-up visits.

Hironobu Kuruma; Makoto Ikeda; Ken Yanagisawa; Fumiki Ohnishi.

Objective: Physiotherapists often mobilize the thoracic spine for patients with neck or lumbar problems to improve thoracic movement but pain in the peripheral region may improve it. We believed that the autonomic nervous system may be involved in this improvement and in this study mobilization was applied to determine the effect of the autonomic nervous system and pain threshold values. Design: Blinded test. One physiotherapist applied mobilization or electrical current and another physiotherapist obtained measurements. Participants: The study included 32 healthy males randomly divided into three groups: the mobilization group (MOBI group; 12 men; 21.3 years), electrical current group (ELE group; 10 men; 22.1 years), and control group (CONT group; 10 men; 20.9 years). Interventions: The subjects in the MOBI group underwent dorsal mobilization from the 3rd to 6th thoracic vertebrae for 5 min. The subjects in the ELE group underwent transcutaneous electrical stimulation at the level of the 3rd to 6th thoracic vertebrae for 5 min. The subjects in the CONT group lay on their stomach for 5 min. Statistical analyses of the results of intervention and between groups were performed using two-way repeated analysis of variance and a post hoc Bonferroni method was applied. Analyses were performed with IBM SPSS ver. 19 with p < 0.05 being considered significant. Main Outcome Measures: We measured the salivary amylase levels using chips and pain threshold values at the levator scapulae and gastrocnemius muscles before and after the intervention. Level of Evidence: Level 2. Results: There were no significant differences in salivary amylase levels among the groups. The pain threshold values for the levator scapulae were significantly decreased in the MOBI and ELE groups and those for the gastrocnemius were significantly decreased in the MOBI group. There were interactions in all muscles. Conclusions: Thoracic spine mobilization may induce an autonomic nervous system response.

No. 255 Cervical Meningo myelitis After Lumbar Epidural Steroid Injection.
Yu Jin Lee; Joon-Sung Kim.

Introduction: Lumbar epidural steroid injection (ESI) in the management of the low back pain (LBP) is increasing annually. There are few reports of cervical meningo myelitis after lumbar ESI. We report a case of cervical meningo myelitis following lumbar ESI. Case Report: Sixty-year-old male with history of diabetes mellitus presented our hospital with severe posterior neck pain after lumbar ESI. He had a persistent LBP with left thigh radiating pain for one month. He received lumbar ESI at left L4 L5 level two times with interval of two weeks. Pain showed no improvement and 3 days later he visited another pain clinic and received ESI. Few hours after the injection he complained of severe posterior neck pain. He was transferred to our emergency department. Laboratory test showed elevated inflammatory values. Blood glucose levels were poorly controlled through insulin. L-spine MRI revealed hematoma in S1 epidural space. Under the diagnosis of lumbar epidural abscess, antibiotic treatment was started. Despite the treatment he complained of bilateral lower extremity weakness and sensory disturbance. Soon symptoms progressed to both upper extremities. MMT
revealed 1/5 muscle strength in all extremities and sensory examination revealed hypesthesia below C4 dermatome. C-spine MRI showed signal change with swelling of spinal cord at cervical cord and medulla oblongata with epidural fluid collection at upper cervical area. Leptomeningeal enhancement of medulla oblongata and cervical cord was also revealed at C-spine MRI. Surgery was performed but there was no neurological improvement. He has transferred to our rehabilitation department for comprehensive rehabilitation therapy. Lumbar ESI has become a common non-surgical treatment for LBP. But there is no clear recommendation of ESI including injection, amount of steroids, minimal interval, and other restrictions. Pain physicians should be aware of complications such as cervical meningomyletis which should be considered in the differential diagnosis.

No. 257 Modic Changes: Antibiotic Treatment in Chronic Low Back Pain Patients With a Suspected Low Grade Discitis.

Claus Manniche; Lars Morsø; Lene Kietzner.

Disclosure: C.M. owns shares in the non-for-profit company Mast Educational; L.M. and L.K.: None. Objective: To evaluate the effect of a 3-month antibiotic treatment regime in patients referred to a secondary care outpatient spine centre with continuous low back pain following disc pathology and subsequent intervertebral Modic changes type 1 (MC1).

Design: Cohort study. Setting: Amoxicillin/clavulanic acid for 3 months. Participants: 32 patients (15 female) with low back pain for more than 6 months referred to the spine centre. Inclusion: poor exercise tolerance, MRI demonstrating disc pathology in the lumbar spine including MC1, no effect of other non-surgical treatment forms. Main Outcome Measures: Patient’s global assessment at 6 months follow up. Change in spinal pain intensity on a 0-10 numerical rating scale. Numbers of nights with disturbed sleep (NNDS) caused by pain over a 14-night period. Results: The outcome analysis compares the treatment effect group and the non-treatment effect group. Patient global assessment: 59.4 % of the patients stated effect of treatment. Change of spinal pain intensity in “the effect group” at 6 months follow up 2.5 (SD 2.0) and in “the non-effect group” -0.6 (SD 1.9). NNDS in “the effect group” at BL/6 months respectively: 7.6 (SD 5.7), 3.7 (SD 5.2) in “the non-effect” at BL/6 month; 8.7 (SD 5.4); 10.2 (SD 5.0). Substantive side effects were seen in 43% of patients.

Discussion: The antibiotic treatment regime provides positive outcome results for 59% of the spinal pain patients. At 6 months a clinically relevant improvement regarding pain intensity was obtained and number of nights with disturbed sleep was reduced.

No. 258 Pain Assessment in Knee Osteoarthritis: Objective Functional Outcomes Are Feasible?.

Martins F; Imamura M; Oshiro MS; Lopes JA; Hsing WT; Batistella LR (Institute of Physical Medicine and Rehabilitation of Clinical Hospital of Sao Paulo University School of Medicine, Sao Paulo, Brazil).

Disclosure: None. Objectives: This study investigates correlation between subjective and auto related scales for pain (VAS), knee osteoarthrosis impairment (WOMAC), health-related quality of life (SF-36), and objective variables (number of steps) in females up to 65 years old with knee OA. We aim to investigate the instrumental and clinical reliability of accelerometer and pedometer to dynamic condition evaluation of knee and the feasibility of objective functional outcomes for pain impact assessment.

Design: Observational transversal study. Setting: Daily life. Participants: 26 patients with clinical and radiological primary knee osteoarthrosis diagnosis and 25 healthy volunteers. Interventions: Not applicable. Main Outcome Measures: Pain visual analog scale (VAS), knee osteoarthrosis impairment (WOMAC), and health-related quality of life (SF-36) and total number of steps in 7 days using a pedometer and a multiaxial accelerometer. Level of Evidence: Level 1. Results: Accelerometer number of steps of both groups are statistically difference (p=0.03). Pedometer number of steps counting shows that pedometer could not distinguish healthy or affected groups. The correlation between objective analysis (accelerometer number of steps) evidence significant negative correlation with pain, rigidity, and difficulties of WOMAC and VAS (r= -0.149 p=0.037). With functional status, pain, vitality, general status and social function of SF-36 exist a positive correlation. Conclusion: Considering the negative correlation between VAS and accelerometer number of steps we suggest that objective functional evaluations like number of steps might be considered as functional outcomes besides only subjective and auto related scales in knee pain impact or interventional studies. Pedometer could not be useful in this population like accelerometer.

No. 260 Spinal Segmental Sensitization Syndrome as a Common Cause of Chronic Musculoskeletal Pain: A Case Series Study.

Tomas Nakazato Nakamine; Galo Camacho Honorio-A.

Disclosure: None. Objective: To determine the prevalence of spinal segmental sensitization (SSS) syndrome and the radicular segments (RS) involved in a group of patients with chronic musculoskeletal pain (CMP) attending a physiatric consultation. Setting: Private practice physiatric office. Participants: 100 consecutive new patients (mean age 55 ±17 years 57 women) complaining of CMP. Interventions: Anamnestic and clinical examination of participants looking for symptoms and signs of SSS syndrome, a hyperactive state of a RS of the spinal cord whose main manifestations includes hypealgesia of the dermatome, myofascial trigger points within the myotome, and pressure pain sensitivity of the sclerotome.

Level of Evidence: 3. Main Outcome Measures: We used the following 4 clinical criteria for diagnosis: 1) chronic (>3 months) and regional (both axial and peripheral location) pain as described by the patient; 2) pain in one or more dermatomes with the "pinch and roll" maneuver and/or the scratch with the tip of a clip which identify the RS affected; 3) pain at palpation in one or more myofascial trigger points at paraspinal and non paraspinal muscles related to the RS identified previously; 4) pain at palpation of the interspinous ligament and in one or more non spinal sclerotomal structures of the same RS. Results: We found 34 patients with SSS syndrome most of them having more than one RS involved (20 patients). The most frequent RS were located at the lumbo-sacral region (9 at L5, 9 at S1) followed by the lumbar (4 at L2, 4 at L3, 6 at L4) and the m-cervical (6 at C5, 8 at C6) regions. Conclusion: About a third of the patients evaluated for CMP had SSS syndrome according to the clinical criteria proposed. We need a consensus for the diagnosis of this entity which is a common cause of physiatric consultation.

No. 261 The Effects of Spinal Curvatures on Balance in Ankylosing Spondylitis.

Emel Ece Ozcan-Eksi; Esra Giray; Osman Hakan Gunduz; Ilker Yagci.

Disclosure: None. Objective: 1) To compare female and male subjects with ankylosing spondylitis (AS) in posture, spinal curves, and balance and 2) to identify the effects of spinal curves on balance. Design: Prospective controlled study. Setting: University based outpatient clinic, University based spine center. Participants: Twenty subjects with AS (8 female 12 male). Main Outcome Measures: In all subjects spinal curves [T4-T12 angle, lumbar lordosis (LL), sacral slope (SS), pelvic tilt (PT), pelvic incidence (PI)] were assessed on lateral spine x-rays by using Surgimap® program. Balance was assessed by using Neurocom Balance Master System® (Orlando, USA) assisted tests (standing on firm & foam bases, walk across, tandem walk, step & quick turn), posture assessment (tragus wall distance, modified Schober’s test, chest expansion); pain (VAS), disease activity (BASDAI). Results: The groups were similar in age (mean: 43.15±8.28 years), BMI (27.01±5.56 kg/m²), VAS (5.70±2.34), BASDAI (4.75±2.67). The LL was higher in females (57.62±13.58°) than in males (41.83±17.36°) (p=0.036). The sway in Step & Quick turn test was higher in females (p=0.006). In all those with higher VAS had higher LL and SS (p=0.036 r=0.472, p=0.016 r=0.533); those with higher BASDAI had higher SS (p=0.021 r=0.526). The T4-T12 angle had significant
correlations with tragus wall distance, modified Schober’s test, chest expansion (p=0.048 r=0.447; p=0.008 r=-0.573; p=0.006 r=-0.503). Those with increased T4-T12 angles had increased sway velocity on foam base, decreased step length in walk across test (p=0.003 r=0.630; p=0.019 r=-0.518). Conclusions: In all subject with AS, those with higher SS had higher VAS and BASDAI. The lumbar flexibility and chest expansion decreased in those with decreased T4-T12 angles. The subjects with increased thoracic kyphosis walked in shorter steps and had more sway on instable bases. We recommend avoiding progression of the thoracic kyphosis to protect lumbar flexibility and balance in AS.

**No. 262 The Effect of Paraspinal Muscles on the Clinical Outcomes in Subjects With Lumbar Spinal Canal Stenosis.**
Emel Ece Ozcan-Ekli; Ilker Yago; Brian Feeley; Sibel Demir-Deviren.

Disclosure: None. Objective: To determine the effect of atrophy and fatty infiltration of paraspinal muscles on the clinical outcomes in subjects with symptomatic LSS. Design: Prospective blinded controlled study. Setting: University-based spine center. Participants: Eleven female subjects with symptomatic LSS (mean age 57.00±11.40 years). Main Outcome Measures: All subjects were assessed with modified Oswestry Disability Index (ODI) for disability, Roland Morris Questionnaire (RMQ) for functionality, McGill Pain Index (MPI) for pain, timed up and go (TUG) test, Berg balance scale for balance. We measured atrophy and fatty infiltration in lumbar multifidus, erector spinae, and psoas muscles on T1-weighted axial MR images. The expected cross-sectional area and functional CSA (FCSA) of the muscles were measured by using free hand technique on OsiriX®. Then the percentage of muscle atrophy was calculated. Fatty infiltration was graded by using Goutallier and quartile classifications. Level of Evidence: II. Results: Subjects with higher Goutallier and quartile scores for the erector spinae at L5-S1 had higher ODI scores (R=0.669). Subjects with greater erector spinae FCSA at L5-S1 had lower MPI scores (R=-0.658). Subjects with greater multifidus FCSA at L4-L5 had lower RMQ scores (r=-0.658). Subjects with more atrophy and fatty infiltration in the multifidus at L5-S1 took longer to complete the TUG test (r=0.628; r=0.652). The atrophy in total multifidus increased as the symptom duration prolonged (r=-0.604). Conclusions: The fatty infiltration particularly in the erector spine at L5-S1 is more significant than the atrophy to predict the clinical outcomes in subjects with LSS. Disability also increased with more fatty infiltration in multifidus muscles. Further studies need to be done to determine the effect of the fatty infiltration and atrophy in paraspinal muscles in the treatment outcomes in patients with LSS.

**No. 263 Magnetic Resonance Therapy for Knee Osteoarthritis: A Double-Blind Placebo Controlled Trial.**
Nurgul Goksen; Mustafa Calis; Havva Talay Calis; Salih Ozgocmen (Dept. PMR Erciyes University Fac. Med. Kayseri, Turkey).

Objective: To investigate the clinical and imaging efficacy of magnetic resonance therapy (MRT) in knee osteoarthritis (OA). Disclosure: None. Design: Prospective double-blind placebo controlled trial with 12-weeks follow up. Setting: A single center study conducted in a tertiary care academic medical center. Participants: One-hundred patients with mild to moderate knee osteoarthritis at a single knee joint. Patients between 30-75 years old without any history of knee surgery, malignancy, metallic implants, pacemakers, or active infection were included. Interventions: The treatment group (n=50) received trigger point dry needling. Group A received placebo MRT. Main Outcome Measures: Patients were randomized by blinded switch cards. Imaging arm included ultrasonography and magnetic resonance (MR) of the knee. Level of Evidence: level 1. Results: Ninety-seven patients completed the study (2 in PLC and 1 in MRT group dropped out). No adverse effect was reported during the study. The average change from baseline in outcome parameters over the treatment period (2 weeks) was similar for the MRT group (on VAS-pain -2.6; WOMAC-pain -2.09; WOMAC-morning stiffness -1.81, WOMAC-physical -1.96) compared to placebo (VAS-pain -1.6; WOMAC-pain -1.91; WOMAC-morning stiffness -1.27, WOMAC-physical -1.54) (p>0.05 for all) Changes from baseline after follow up (3 months) were also not different. SF-36 components at 3 months improved but changes were not significant. Imaging arm also failed to show significant differences between groups in terms of cartilage thickness on US and MR.

**Conclusion:** MRT is a safe treatment for knee OA but not superior to placebo in terms of improvement in clinical or imaging parameters after ten days of one-hour treatment in mild to moderate knee OA.

**No. 264 Evaluation of the Efficacy and Temporal Pattern of Dry Needling in the Treatment of Myofascial Pain Syndrome.**
Marcus Yu Bin Pal; Juliana Takiguti Toma; Helena Hideko Seguchi Kizayami; Daniel Ciampi De Andrade.

Objectives: To evaluate in a prospective sham-controlled study the pattern of analgesic efficacy of trigger point dry needling in myofascial pain syndrome (MPS). Methods: We evaluated patients with unilateral shoulder pain and chronic MPS. Patients were randomly assigned to two treatment arms: active (A) (n=20) and sham (S) (n=21). Group A received trigger point dry needling. Group S received sham treatment. Patients were evaluated one week before needling (D-7), on the day of dry needling (D0), and seven days after the procedure (D+7). Patients filled out the Douleur Neuropathique 4, Beck Depression Inventory, Brief Pain Inventory (BPI), McGill pain questionnaire-SF (SFMPQ) and also filled out a 14-day pain diary with the first part of the BPI. Results: 41 patients were included. The reduction in pain intensity after treatment was significant for the active group (VAS before=54±19 vs. VAS after=29±20; p<0.05). Changes were not significant for the sham group (VAS before=57 ±21.4 vs. VAS after=48.5±29.5; p=0.333). The total score of pain intensity in the SFMPQ was significantly improved in group A (before=51.5±28.7 vs. After=30±31.6; p<0.05) but not in the sham group (before=57.1±32.8 vs. 44.3±26.9; p=0.104). The mean pain interference in life activities did not differ between groups. The worst pain and average 24 h pain score of BPI decreased in the active group only. There were no correlations between more intense pain during needling and immediate or long-term pain relief which was maximal on the 7th day after needling. Conclusions: Dry needling relieves pain when compared with sham procedure of same duration and pain intensity. The analgesic effect built up on the following days after stimulation and was higher on the 7th day after the procedure which argues for long-lasting local effects that go beyond the mechanical effect of the procedure. Needling may serve as a complementary therapeutic option in these patients.

**No. 265 Polymorphism of IL3 Is Associated With Complex Regional Pain Syndrome.**
Minho Park; Jimmann Chon; Seung Yeol Lee.

Aim: Interleukin-3 (IL3) is a hematopoietic colony-stimulating factor that is capable of supporting the proliferation of broad range of hematopoietic cell types. IL3 also has neurotrophic activity. The aim of this study was to investigate whether promoter single nucleotide polymorphisms (SNP) (RS181781 -1107g/a) of the IL3 gene are associated with the development and ischemic stroke syndrome (IS). Method: We enrolled 121 IS patients and 291 control subjects. Genotype of SNP was determined by direct sequencing. SNP stats and SPSS 18.0 programs were used to evaluate odds ratios (ORs) 95% confidence intervals (CIs) and p-values. Multiple logistic regression models were performed to analyze genetic data. Results: The RS181781 SNP was associated with complex regional pain syndrome (CRPS) of IS (codominant 1 model OR=0.21 95% CI=0.07-0.69 p=0.006; dominant model OR=0.29 95% CI=0.10-0.81 p=0.013; overdominant model OR=0.21 95% CI=0.07-0.66 p=0.0033). However the promoter SNP did not find difference between IS group and control group (p>0.05). Conclusion: The result suggests that the promoter SNP RS181781 of IL3 may be associated with the CRPS of IS in the Korean population.
No. 267 Correlation Analysis Between Digital Photography Measurement of Trunk Deformity and Self-Image Perception in Patients With Idiopathic Scoliosis.
Judith Sánchez Raya; Antonia Matamalas Drover; Elisa D’Agata; Joan Bago Granell.

Objective: To assess the validity of a clinical assessment tool of the trunk deformity based on photographs as compared to self-assessed appearance questionnaires. Study Design: Concurrent validity between postural indexes obtained from digital photographs and self-assessed appearance questionnaires. Setting: Tertiary university traumatology and rehabilitation hospital of Barcelona, Spain. Participants: 80 consecutive patients (68 females and 12 males) aged 12 to 40 years old (average 20.3 years old) were included. Mean Cobb angle was 45.96° (range 25.1° to 77.2°).

Intervention: Front and back digital photographs of patients with idiopathic scoliosis (Cobb angle >25°) were obtained. Main outcomes measures: shoulder, armpit, and waist angles in addition to trunk asymmetry indices were calculated on front and back photographs with Surgimap software. All patients completed SRS-22, SAQ, QLSDP, and TAPS questionnaires. The Spearman’s rank correlation coefficient (r) was used to estimate concurrent validity between both methods. Level of Evidence: III. Results: A significant correlation was found between waist height angle and TAPS (r=-0.31 to -0.34), SAQ appearance subscale (r=-0.27 to 0.35), and SAQ total score (r=0.25 to 0.29). No correlation between shoulder imbalance and self perception image was found. No correlation between TAPS, SAQ, and other photography measurements was found. A significant correlation was found between shoulder height angle and trapezius angle ratio and SRS-22 questionnaire on front photograph (pain: range from -0.26 to -0.34 subtotal:-0.23).
Conclusion: Waist height angle measured with digital photography is moderately correlated with perceived trunk appearance. Trunk asymmetry is poorly correlated with self-assessed appearance. Picture scales are better correlated with photographs than verbal rating scales.

No. 268 Special Treatment of Patients With Low Back Pain.
Michaela Tomanova, MD, MBA; Lee Cabell EDD. (*Rehabilitation Clinic Brandýs Nad Orlicí Czech Republic and +Selton Hall University, New Jersey USA*).

Objective: Low back pain (LBP) is a social and economic problem that affects 60% to 85% of the population. The infinity method treatment (IMT) utilizes therapeutic movements either through active movements by a patient or passive movements facilitated by a therapist which are conducted through either conscious or unconscious participation by the patient. The three-dimensional rehabilitation therapy movements are performed in a series of figure eight circle and spiral motions to stabilize the whole body and lumbar region in LBP patients. The objective of the study was to test the efficacy of rehabilitation on LBP patients treated with IMT for five to seven weeks five times per week for a minimum of 30 minutes each session. Setting: Rehabilitation clinic. Participants: 24 LBP patients (65.50 ± 10.67 y). Interventions: While the patient was standing we measured barefoot plantar pressure, weight distribution, and center of force (COF) with a pressure mat system (MatScan), we measured barefoot plantar pressure, weight distribution, and center of force (COF) before and after the treatment.

Results: Data were analyzed with the paired t-test. The visual analog scale (VAS) of spine subjective pain scores was measured before and after the treatment and was analyzed with the Wilcoxon signed-ranks test. Main Outcome Measures: All the dependent variables were significant after treatment. Results: The values of lowered dependent variables after treatment were: measured area of COF (mean paired difference of 2.80 cm²) p<0.0001; A-P weight distribution (mean paired difference 0.96 cm) p<0.0001; M-L weight distribution (mean paired difference 1.45 cm) p<0.0001; VAS (mean paired difference 2.50) p<0.0001. Conclusions: The IMT provides stability, body balance, and a corrected body posture. There is better weight distribution on the sole of the feet and better overall body center of gravity position than before IMT.

No. 269 Special Rehabilitation Treatment of Patients With Low Back Pain.
Michaela Tomanova; Lee Cabell; Marcela Lippert-Grüner.

Objective: Our special rehabilitation treatment, the infinity method treatment (IMT), utilizes therapeutic movements either through active movements by a patient or passive movements facilitated by a therapist which are conducted through either conscious or unconscious participation by the patient. The three-dimensional rehabilitation therapy movements stabilize the whole body and lumbar region in low back pain (LBP) patients. The objective of the study was to test the efficacy of rehabilitation on LBP patients treated with IMT for five to seven weeks, five times per week, for a minimum of 30 minutes each session. Setting: Rehabilitation clinic. Participants: 24 LBP patients (65.50 ± 10.67 y). Interventions: While the patient was standing on a pressure mat system (MatScan), we measured barefoot plantar pressure, weight distribution, and center of force (COF) before and after the treatment. Data were analyzed with the paired t-test. The visual analog scale (VAS) of spine subjective pain scores was measured before and after the treatment and was analyzed with the Wilcoxon signed-ranks test. Main Outcome Measures: All the dependent variables were significant after treatment.

Results: The values of lowered dependent variables after treatment were: measured area of COF (mean paired difference of 2.80 cm²) p<0.0001; A-P weight distribution (mean paired difference 0.96 cm) p<0.0001; M-L weight distribution (mean paired difference 1.45 cm) p<0.0001; VAS (mean paired difference 2.50) p<0.0001. Conclusions: The IMT provides stability, body balance, and a corrected body posture. There is better weight distribution on the sole of the feet and better overall body center of gravity position than before IMT including lower spine pain in LBP patients.

Yinfei Rachel Xu; Stuart B. Kahn; Junney Baeza Dager; Sheeraz A. Qureshi.

Disclosure: None. Setting: Tertiary care rehabilitation unit. Description: Patient is a 79-year-old morbidly obese female with chronic lower back pain (LBP) secondary to severe multilevel spondylosis and herniations L3 through S1 causing canal and foraminal stenos. She underwent fluoroscopy-guided T12-L1 interlaminar epidural steroid injection (ESI) at a spine center for pain symptoms correlating to a new T11-12 herniation. Afterwards, she developed left leg paralysis, paresthesia and exacerbating LBP. In the emergency room, MRI confirmed enlargement of the thoracic herniation causing spinal cord shift and signal intensity within cord. The patient showed symptomatic improvement so emergent surgical decompression was deferred and she was admitted to acute inpatient rehabilitation. Her exam revealed incomplete L1 SCI grade C and admission FIM™ score of 46/105. Three weeks later, pain became intolerable and cauda equina syndrome (CES) developed, warranting surgery. Assessment/Results: Post-operatively, patient made effective gains though she remained weak in legs with bowel and bladder symptoms. Comprehensive rehabilitative measures were continued and by four-month outpatient follow-up, patient had made a full recovery with a FIM™ score gain of 59 points. Discussion: In spine injuries, medical decisions are complex and require interdisciplinary conversations, close clinical observation, and up-to-date knowledge of literature. We will explore the possible mechanisms of injury, review literature pertaining to indications for ESI and discuss in detail the controversial timing for surgical intervention in acute SCI, CES and central cord syndrome. Regardless of management decisions, physician must help patients set realistic expectations for outcome and provide rehabilitative, surgical, neuropsychological and social services as an integral part of care. Conclusion: Through interdisciplinary management of a suboptimal outcome, care can be optimized to facilitate the best potential for recovery.
PEDiATRIC REHAbiLITATION

No. 271 Assessment of Children With Neuromotor Disabilities From 6 Months to 7 Years Old Served in Healthcare Institution By Means of PEDI (Pediatric Evaluation of Disability Inventory).
Lucía Allen Hermosillo; Md Laura Hermila De La Garza; Hector Alfonso Puentes V.; Ot Luis Vital.

Disclosure: None. Objective: Validate Pediatric Evaluation of Disability Inventory (PEDI) in children with motor incoordination cerebral origin (IMOc) treated in this institution. Design: Transversal prospective observational. Setting: Applying PEDI in rehabilitation unit from Monterrey, Mexico. Participants: Children with psychomotor retardation secondary to neuromotor disorder from 6 months to 7 years old and caregivers. Interventions: We evaluate functional level of the child and family caregivers performing inventory PEDI children and caregivers attended in the month of August and December 2012. Main Outcome Measures: Cronbach alpha instrument to measure internal reliability. Results: 48 pediatric assessment inventory evaluations applied to 31 boys and 17 girls with average age 3.9 years old where was measured self-care, mobility, social function to child and its dependence with the caregiver finding a significant internal reliability of instrument (Crombach’s alpha = 0.963). Conclusions: PEDI assessment for children with neuromotor disorder offers an option defined in detection of motor and social abilities of the child and its family allows us to detect maximum qualities for its independence and applied at early age assess motor child needs so that you achieve maximum of your functional skills with interaction of caregivers for their achievement. Evidence Level: II.

No. 272 Agenesis of the Second Right Hand Radio.
Idoya Barca Fernandez; Concepcion Cuenca Gonzalez; María Isabel Flores Torre; María Rosario Urbez Mir.

Location: Hospital Clinic San Carlos, Madrid, España. Disclosure: None. Setting: Regional hospital and national reference. First level hospital. Patient: Infant of 3 months referred for assessment by pediatric surgical department for ageness of the second right hand radio and the fourth radio hipoplasia. Case Description: Pregnancy without complications, normal delivery at 39 weeks, birth weight 3500 kg. Breast feeding with good suction ef: realise fist with 1, 3, and 5 fingers of the right hand with correct pressure with 4th fingers excluded. Balance 4 finger joint: flexion metacarpolliangea 60° proximal interphalanegal flexion 30°. No distal interphalanegal mobility. Occupational therapy and kinesiotherapy intends to get functionality of the 4th finger on the right hand press pattern integrate the hand in the body schema; ocular-motor stimulation of discriminative sensation and estereognosica and developing the ulnar palmar press or drag. With short term treatment we hope to achieve function in the three digit clip of the 1, 3, and 5 fingers using bimanual manipulative activities and establish dominance in the left hand. We will try to reduce the anxiety of the parents. Assessment: Results evaluation 5 month: there is no free sitting position reaction of parachute with previous support scopes up objects without crossing the midline done correctly with left right turning with more difficulty. Clamp cubitopalmar achieved with 5th finger attempt failed with flexion incomplete of the MCF 4th finger. Discussion: Digital agenesis or symbrachydactyly is a malformation congenital ranging from 1 or more intermediate phalanges aphasis fragment of the hand with adactilia. The objective of treatment is to improve the function of the hand allowing adequate school, family and social integration of the child. Conclusion: Treatment of congenital hand malformations will depend on the child’s age, the severity and cause of the alteration and the raised expectations and tolerance of the children to them.

No. 273 Evaluation Model of Pediatric Population With Cerebral Palsy and Spasticity in Routine Clinical Practice In Mexico.
Benavides Aguilar Oscar, MD.; Carranza Del Río Jorge, MD.; Zorrilla Sánchez Javier, MD.; Gómez Hernández Francisco J, MD.

Disclosure: Investigator initiative record. Objective: Establish an evidence-based standardized model of patient clinical evaluation in order to be able to determine and compare common clinical practice and treatment of pediatric population with cerebral palsy using a registry. Common clinical practice used botulinum toxin type A, rehabilitation techniques, and pharmacoconomics. It also allowed the creation of a registry which is in its approval process and will provide epidemiologic information of this patient population. Design: Prospective multicenter standardized study. Participants: Multidisciplinary equipment specialized in management of pediatric patients with cerebral palsy. (Pediatric neurologists, rehabilitation physicians, and an orthopedic surgeon) Interventions: Not applicable. Main Outcome Measures: The application of the following scales were standardized: modified Ashworth scale, Tardieu scale, gross motor function classification system for children with cerebral palsy, goal achievement scale, Faces pain scale, revised observational gait scale, physician's global assessment scale, manual ability classification system for children with cerebral palsy, range of motion measurements, and a quality of life questionnaire for children. Level of Evidence: 1. Results: Advisory board trained and standardized physicians since May 2012 to September 2013, the patients will be included in the next 2 years. Conclusions: This model allowed the implementation of a standardized assessment of children with cerebral palsy and the treatment of a multidisciplinary equipment.

No. 276 Effectiveness of a Comprehensive Rehabilitation Program in Rehabilitation Centers Teleton (CRITs) Evaluated Through weefIM: 10 Years Experience.
Nayelli Castañeda Pérez; Edna Berumen Amor.

Objective: To determine the efficacy of a comprehensive rehabilitation program rehabilitation centers Teleton (CRITs) evaluated through weefIM. Methods: A descriptive and retrospective longitudinal study was conducted. Participants: 10000 records of discharged patients in 17 centers studied. Material and Methods: A descriptive and retrospective longitudinal study was conducted. Data were obtained from electronic records system incorporated in the Teleton Children's Rehabilitation Centers (CRIT). The instrument is to assess the effectiveness. WeefIM is based on conceptual format and organization of the World Health Organization (WHO) used in the FIM instrument (functional independence measure - measuring functional independence). WeefIM is an instrument validated in the U.S. and Mexico and measures the child’s required assistance in the domains of self-care, mobility and transfers, and cognition regardless of the condition or deficiency. Biometrically based on good reliability for different pathologies and test its validity with different instruments. Main Outcome Measures: Descriptive statistics: for quantitative variables mean and standard deviation were obtained; for categorical variables absolute and relative frequencies were obtained. Analysis by t-student improvement by comparing the initial weefIM score and final. Results: Evaluating the effectiveness of a comprehensive treatment program in the 17 CRITs was evaluated by weefIM at baseline and end of treatment; in all cases the difference was positive (mean 9.8 points) and statistically significant (p 0001). Conclusions: In this study the model of integrated and transdisciplinary intervention with specific therapeutic goals for each patient has proven effective in the 17 CRITs. Level 1 (likely reliable) evidence - representing research results that address clinical outcomes and support of other scientific literature.
No. 277 Prevalence of Pressure Ulcers in Pediatric Patients Hospitalized at the Instituto Nacional De Pediatría.

Maria Del Carmen García Cruz; Dra. Rosa Inés Esparza Zapata; Xanath Oliva Rosas Huerta; Alejandro G. González Garay.

Objective: To determine the prevalence of pressure ulcers in pediatric patients hospitalized at the Instituto Nacional de Pediatría. Design: An observational descriptive transversal and prospective study. Setting: Pediatric institution in Mexico City. Participants: Hospitalized patients were included, any service and sex, under 18 years old, with more than 24 hours of hospitalization consent and/or assent informed. We excluded patients with pressure ulcers on admission or ulcers of other etiology. Physical examination was performed on all patients to identify those with UPP reporting number, location, extent, and stage of the same and degree of mobility with Braden scale. Intervention: None. Main Outcome Measures: There was calculated the index of conformity kappa for the consistency between assessors; analysis univariado for measures of central trend; frequencies and proportions. For qualitative variables we used the Mann-Whitney U test; for the association of 2 categorical variables the Chi squared test was used. Results: We evaluated 272 patients. 30 had pressure ulcers; a total of 63 ulcers 14 male 16 female with a prevalence of 12%. The most prevalent services were intensive care unit (70%) and neurosurgery (30%). The most common sites were the occipital region (n=19) and heels 20% (n=13). Stage II was the most common 50% (n=32) followed by stage I 30% (n=19) with average surface 12.46cm². Braden mobility grade 1 (completely immobile) was the most frequent 36% (n=11). The risk factors found were immobility, hospital stay, surgery, use of diapers, sepsis, anemia and lymphopenia. Conclusions: The prevalence of pressure ulcers in pediatric patients is high. It suggests implementing prevention strategies in children. Reprinted with permission.

No. 278 Determination of Kinematic Parameters of Upper Limbs During a Functional Task in Healthy Children and Adolescents.

Erika García Olvera; Demetrio Villanueva Ayala, MD; Juan Carlos Pérez Moreno; Paulinam Monserral Valerio Acosta Eng.

Objective: To determine the kinematic parameters in the upper limbs in healthy children and teenagers during a functional task. Design: A descriptive observational cross-sectional prospective. Ubicación: Centro de rehabilitación infantil telefón Mexico. Setting: The functional task performed in 4 phases: 1) scope of the subject, 2) we bring the object to the mouth, 3) from mouth to the table, and 4) return to the starting position. Participants: 19 children and adolescents. Type of non-probability sampling consecutive case. Intervention: Not applicable. Main Outcome Measures: Use three-dimensional motion analysis equipment. Descriptive statistical analysis was performed and included mean standard deviation and confidence intervals of 95%. Level of Evidence: 1. Results: Parameters were obtained for shoulder flexion-extension range of motion from 0° to 46° and abduction-adduction 2.1° to 9.5°, elbow flexion-extension 100° to 135°, and angular velocity; hand linear velocity uniformity in the same can be seen in the transport phases. Percent of each phase cycle during functional task performed ± standard deviation of dominant limb: moving the hand to grasp the same object and 26.8% ± 5.12%, transportation of the object to the mouth 23.8% ± 3.41%, transportation of the object to the table 25.0% ± 4.09%, moving the hand to the starting position 24.4% ± 5.18%. Conclusions: The determination of kinematic parameters of the upper limb using three-dimensional analysis is useful for documentation and both quantitative and qualitative assessment of a specific functional task. It can be used as a tool for the evaluation of the results of a rehabilitation treatment and to develop treatment strategies against a variety of diseases since it allows to measure and chart the motion degree at each joint and its speeds kinematics of upper limb of children and teenagers.

No. 279 Unusual Cause of Pain in a Non-Communicative Male With Cerebral Palsy-A Case Report.

Heakyung Kim; Teerada Ploypetch; Mi Ran Shin.

Disclosure: None. Setting: Rehabilitation outpatient setting. Patient: A 23-year-old nonverbal male with severe dystonic cerebral palsy (CP). Case Description: The patient had been suffering intractable pain for 4 months with increasing severe dystonia. His parents scored his pain a 20/10. No pain sources were found after numerous work-ups with many different specialists. His abdomen was severely distended and the whole body was so dystonic that range of joints and sitting on wheelchair were impossible. His trunk was in an opisthotonic posture. His lips were mutilated from constant biting due to severe pain. Assessment/Results: Onabotulinum toxin A (BTX-A) injections were done to see if his pain could be decreased to better control dystonic muscles. BTX-A injections to his gluteus maximus, hip adductors, medial hamstrings, rectus femoris, paraspinal muscles, and left iliopsoas totaling 500 Units were performed. On the 4-weeks post-injection follow-up the patient’s abdomen was soft and the dystonic posture was so improved that it allowed us to range the large joints of his lower limbs and trunk. He was able to maintain sitting on wheelchair without sliding out. His constipation was improved. His pain was scored 0/10. Discussion: His distended abdomen could be due to blockage of his rectum. The stiff muscles around the rectum disallowed passage of gas and stool. The distended abdomen could cause pain which would increase dystonia resulting in a vicious cycle of pain. BTX-A injections to hip adductors, gluteus maximus, and medial hamstrings which allows passage of gas and stool and stops his vicious cycle of pain. When the BTX-A injections were off 3.5 months later dystonia, pain, and abdominal distention returned indicating the success of the prior treatment. Repeat injections improved his pain. Conclusion: This case indicates the importance of tone management for people with severely increased muscle tone when the etiology is unknown. Reprinted with permission.

No. 280 Effects of Distal Hamstring Lengthening on Anterior Pelvic Tilt in Children With Cerebral Palsy: A Retrospective Study.

Radha Korupolu, MBBS MS (Department of Physical Medicine and Rehabilitation, University of Kentucky, Lexington, KY); Hank White, PT PhD (Shriners Hospitals for Children Lexington KY); Sara Salles, DO (Iwinski Henry).

Objective: Distal hamstring lengthening (DHL) is commonly performed in children with cerebral palsy (CP) to improve crouched gait. However there is a concern that DHL may have undesirable side effects. Several studies have evaluated short-term outcomes of DHL in a small number of subjects and these studies have shown inconsistent results. The purpose of the present study was to evaluate effects of DHL on anterior pelvic tilt when walking in a larger population of children with crouched gait due to CP. Design: Retrospective study. Setting: A tertiary referral center for cerebral palsy. Participants: 147 ambulatory children with cerebral palsy spastic diplegia who underwent DHL in isolation or as a part of single event multilevel soft-tissue surgery. Intervention: n/a. Main Outcome Measures: Knee, hip, and pelvic kinematics were collected by chart review from preoperative and postoperative 3-D gait analysis data. Data analysis was performed only for the right limbs of the subjects. Level of Evidence: 2. Results: There was no significant change in hip kinematics after DHL. At mid–stance >10° increase in anterior pelvic tilt was noted in
18% (n=26) of the subjects. Mean increase in anterior pelvic tilt in this group (n=26) was 14.9° ± 0.001 and in remaining subjects (n=121) mean change in pelvic tilt was 2° p<0.0001. Subjects with simultaneous rectus femoris transfer (RFT) were noted to have a smaller increase in mean anterior pelvic tilt compared to subjects without RFT (2.8° vs. 5.8° p=0.01). **Conclusions:** On average only a 2° increase in anterior pelvic tilt was noted. A small percentage of subjects demonstrated greater than 10° increase in anterior pelvic tilt. However DHL combined with RFT when indicated can counteract the effect of DHL on pelvic tilt. Future research is needed to evaluate the long-term effects of DHL in a larger population.

No. 281 Clinical-Epidemiological Characterization in Pediatric Patients With Cerebral Palsy. Paulo Sergio Leon Solorio; Maria Margarita Rios Cervantes; Xochilt Veronica Larios Gonzalez; Cecilia Colunga.

**Objective:** To describe the clinical and epidemiological characteristics of a sample of patients with cerebral palsy (CP) treated in a tertiary hospital in Mexico. **Design:** Retrospective and analytical. **Location:** The research was performed at a pediatric hospital in the west region of central Mexico from the rehabilitation department. **Participants:** 256 paediatric subjects with cerebral palsy were recruited from the pediatric rehabilitation department in the period of time from January 1 to December 31, 2013. **Interventions:** None. **Level of Evidence:** 2. **Results:** The final sample was 256 records of patients with cerebral palsy: 53% were male, 62.5% of patients were obtained by cesarean, the most frequent type of CP was spastic with 92%, with the major subtype being quadriaparesis 45.3%. The most common complications encountered were orthopedic and visual with 40.2% and 30.8%, respectively. The most common risk factors were urinary tract infections 19%, intraventricular hemorrhage 23%, hypoxic-ischemic disease 29%, hyperbilirubinemia 25.8%, and seizures with 33%. The mean pregnancy rate was 2 gestations per woman with an average age of 28 years old and a media of 35 weeks-pregnancy, the mean weight of newborns was 2.4 kg. There was no correlation observed neither gender of the newborn nor the age of the mother with CP or other complications. **Conclusions:** CP is a common diagnosis observed in the central region of Mexico. The results obtained in this study correlate with the international statistics. However further investigation should be performed to acquaint the social role and participation of the subjects in the long term.

No. 284 Hearing Screening a Target From the Academy. Luis Mauricio Mora Caro; Doris Valencia Valencía.

**Disclosure:** Hearing screening a target from the academy poster. XXVI National Congress of Physical Medicine and Rehabilitation. Armenia quindio 10 to 13 October 2012. **Objective:** To implement hearing screening by otoacoustic emissions (TEOAE) embodiment of the population aged 5 capital district between the years 2008-2012. **Intervention:** To implement hearing screening by otoacoustic emissions (TEOAE) embodiment of the population aged 5 capital district between the years 2008-2012. **Setting:** First and semi-structured interview and coding with ATLAS-ti software. **Participants:** 764 infants between 24 and 43 weeks gestation born in five hospitals in the capital district between the years 2008-2012. **Main Outcome Measures:** Prospective cohort study longitudinal cutting. Making TEOAE newborns to 5 hospitals in the district. Protocol: perform the test with traces emissions which report two different types of results: “pass” (indicating the integrity of the auditory pathway to the cochlea) or “refer” indicating suspicion of hearing impairment so repetition is performed per month. If this second test was passed, auditory evoked potentials were applied and patients were admitted to hearing rehabilitation programs. Statistical analysis and SPSS version 3.2.6 epinio 20. **Results:** Homogeneity of gender in patients in the sample examined. Over 60% of the patients are between 38 and 40 weeks gestational age. Higher prevalence of result fails (suspected neural hearing loss) in patients compared to preterm term. **Conclusions:** The results may be related to improvement in the care of prematurity in the neonatal intensive units policies of mechanical ventilation, nutritional support, decreased oxygen concentrations.

No. 285 Modified Muscle Activation During Equinus Gait Simulation in Children. Olivier Remy-Néris; Laetitia Houx, MD; Mathieu Lempereur; Sylvain Brochard.

**Disclosure:** None. **Objective:** Evaluate the threshold of muscle activation changes and characterize the different muscle activation adaptation induced by a progressive unilateral equinus. **Design:** Experimental clinical gait analysis study. **Setting:** University hospital. **Participants:** 10 typically developing children (4 girls mean age= 9.7 years). **Intervention:** A customized orthosis was fitted on the right ankle of each child and adjusted to limit dorsiflexion in 5 positions (-10°, 0°, 10°, 20°, and maximum plantarflexion [MP]). Gait analysis was performed with a Vicon motion analysis system. The muscle activity of rectus femoris (RF), vastus lateralis (VL), hamstring (HA), tibialis anterior (TA), and soleus (SOL) muscles of both limbs was recorded. **Main Outcome Measures:** After normalization the EMG activity of each muscle was compared during the different gait conditions. **Level of Evidence:** Level 1. **Results:** Significant changes in muscle activations and co-activations were observed for an equinus superior to 10° of plantarflexion in the ipsilateral limb to the orthosis and 20° of plantarflexion in the contralateral limb. SOL activation appeared prematurely in terminal swing and increased with the equinus. TA activation increased at initial and mid swing and decreased during terminal swing. HA activation increased during the loading response while there were no major significant modifications of RF and VL activation. On the contralateral side similar activation changes appeared on the TA and SOL muscles. The main co-activation changes occurred for the SOL/TA pair in both limbs. **Conclusions:** The equinus induces muscle activation changes during self-paced gait due to the foot position when it reach 10° of plantarflexion. Muscle activation changes observed in pathological gait of impaired children must consider these changes to adapt the treatment such as botulinum toxin and moreover muscle lengthening during surgical procedures only to the pathological muscle activations.

No. 286 The Health of Caregivers of Children With Chronic Disability and the Rehabilitation Impact on Them. Martha V. Ortiz C; Doris Valencia V; MD; O. Daniel; P. Páez; Fabián J.F. Páez P., MD (Universidad Nacional De Colombia/ Fundación Hospital La Misericordia).

**Disclosure:** None. **Design:** Qualitative-phenomenological study using semi-structured interview and coding with ATLAS-ti software. **Setting:** Two health institutions in Bogotá, Colombia. **Participants:** By sampling combined 20 caregivers were selected with disabilities for more than 6 months duration of different pathologies with mild to severe dependence and rehabilitation management. **Interventions:** Not applicable. **Main Outcome Measures:** Changes in health and impact of rehabilitation. **Level of Evidence:** 3. **Results:** All were family caregivers, mostly mothers. Most caregivers of children with severe disabilities had higher physical health disorders: low back pain more often, also headache and arthralgia which related to stress and long hours of care, many mentioned “physical
fatigue” predominantly at night and sleep interruptions to take care of children during the night. Yet most had not received medical care. Men showed less physical alterations. All caregivers were emotional, experienced distress, depression, and anxiety often due to the lack of autonomy in their activities. Some mothers felt frustration at the lack of achievements and limitations of their children. Less than half had been referred to psychology but did not attend due to personal problems or because they considered it unnecessary. Some mothers expressed difficulty moving their children to the rehabilitation program which required more time and dedication altering their daily lives. Caregivers who had accepted the situation of children and those whose children had improved functionality considered rehabilitation decreased stress, but those who still had no expectations in line with reality felt dissatisfied. Caregivers had not received any formal training to care. Conclusion: Caring for a disabled child affects physical and emotional health of the caregiver and rehabilitation decreases stress and anxiety only in some of them. Intervention directed to the family and the caregiver to increase the positive impact of rehabilitation is required.

No. 287 Our Experience With Extracorporeal Shockwave Therapy (ESWT) in Spastic Children With Cerebral Palsy (CP).

Liliana Padure; Dr Andrade Mirea; Prof Tiberiu Spiru; Prof Gelu Onose.

Objective: As there are already some reports on the use of ESWT for the spasticity management of children with CP, the purpose of our trial was to achieve improvement of our patients. Design: Patients were assessed twice: first time during admission (before 1st ESWT application) and second at discharge (after the 4th ESWT session). Setting: National Centre for Children Neuromuscular “Dr. Nicolae Robanesca” Bucharest, Romania. Participants: We included 56 spastic children in our study with CP aged 5-18 years. Interventions: We used focused ESWT in 4 sessions during the admission of each child on the mainly affected muscles using for all the same treatment parameters (intensity: 0.15 mJ/mm²; 500 shocks; frequency: 10 Hz). Main Outcome Measures: The following examinations have been performed: active range of motion, modified Ashworth scale scores, and patient’s quality of life (QOL). Level of Evidence: Level 2 (mid-level). Results: ESWT proved to be statistically efficient in upper limbs and lower limbs muscles reducing the Ashworth Modified scale scores according to the calculated efficiency through the Somers’ D from 0.609 (for hamstrings) to 0.815 (for adductors). Discussion: ESWT applied in 4 times in 2 weeks decreased spasticity level in children without affecting the quality of life as other anti-spastic procedures might do. For more reliable statistical assessment and improvement of the methodology further studies are necessary.

No. 288 Follow-Up of Children With Hearing Loss Diagnosed by Brainstem Auditory Evoked Potentials.

O. Daniel Páez; Fernando Ortiz C, MD; V. Martha; C. Ortiz; Fabián J.F. Páez (Universidad Nacional De Colombia - Instituto De Ortopedia Infantil Roosevelt).

Disclosure: None. Objective: Describe the health outcome after electrophysiological diagnosis of sensorineural hearing loss obtained by brainstem auditory evoked potentials (BAEP). Design: descriptive retrospective-prospective and cross-sectional study in which a telephone survey was conducted. Setting: Health institution in Bogotá Colombia. Participants: Caregivers of patients who at least 6 months earlier had undergone BAEP study at ages from 6 to 60 months and that electrophysiological outcome was moderate severe or profound sensorineural hearing loss. Interventions: Not applicable. Main Outcome Measures: The time between the electrophysiological diagnosis and initiation of treatment. Perceptions about the cause of the delay in starting treatment. Level of Evidence: 3. Results: Of the 55 patients with electrophysiological diagnosis, diagnosis of hearing loss was discarded in 9. Of the remaining 46 patients, 18 (39.1%) were ordered treatment with hearing aid or cochlear implant but when the phone call was made, only 13 patients (28.3%) had been amplified. The average age of onset of hearing aid amplification was 37 months (range 12-75) and for the cochlear implant was 37.6 months (range 32-45). The time between the BAEP and the amplification was less than 6 months in 30.8%, 7-12 months in 23.1%, and between 13-24 months in 46.1%. The reported causes for the delay to start treatment were administrative problems with the provider of health services (PHS) 47.8% and the delay in defining the medical behavior (28.3%). Conclusions: 6 months after diagnosed hearing loss, hearing amplification had still not been ordered in 60.9% of cases. The average age of amplification was well above the internationally recommended. Administrative problems with PHS were the main cause of delay in treatment. In Colombia the BAEP study is not associated with a policy of institutional assessment and treatment within a defined time so the delay in diagnosis and treatment of deafness persists.


Jeong Mee Park, MD PhD; Jin Hyeong Lee, MD; Hee Kim; Hwang Min Kim.

Setting: Tertiary care hospital. Patient: A 12-month-old boy with bilateral congenital amelia of first finger accompanied with left radial club hand. Case Description: Rehabilitation assessments including hand function test were conducted every three months. Occupational therapy and ADL training were undertaken for more than thirty minutes per session twice a week. The mother was educated to carry out more than thirty minutes of daily proper PROM exercise for the child. Also a hand orthosis was applied to maintain movement range of both hand and train proper grasp pattern and the mother was educated to apply the orthosis at least two hours per day at home. The child had surgical treatment of pollicization of right index finger and correction of left congenital club hand at the age of thirty-seven months. At two months post-surgery rehabilitation assessments including hand function test and occupational therapy were resumed. Currently the child is a four-year-old sustaining intensive occupational therapy of training opposition with his pollicized index finger. The activities of daily living (ADL) test score became 96 (maximum 126) which is a level of ordinary four-year-old participating in personal hygiene activities with the help of caregivers in setup and finishing. Assessment/Results: After 10 months of post-surgery rehabilitation the pollicized index finger was able to perform oppositional movement and the hand function enhanced greatly. His therapist noted improvement in ADL test score and dexterity of manipulating small objects. Discussion: This is a case in which pre- and post-surgery rehabilitation programmed for a child with bilateral congenital hand deformity without functional use resulted in functional improvement by ensuring his body scheme. Conclusion: Pre- and post-surgery rehabilitation programmed for BCA patient is considered to be highly effective in maximizing the surgical effect and hand function development.

No. 290 The Continued Efficacy of Repeated Single-Event Multi-Level Chemoneurolysis in Children With Cerebral Palsy.

Teerada Ploypetch; Heakyoung Kim, MD.

Objective: Repeated botulinum toxin-A (BTX-A) injections have shown to be less effective after 2-3 rounds in children with spasticity due to
antibody formation from frequent treatment and receiving higher weight-adapted maximum dose per treatment. Single-event multi-level chemoneurolysis (SEMLC) uses 5% phenol/45% alcohol in addition to BTX-A for cases whose maximum dose of BTX-A was not sufficient for their condition enabling to treat multi-level spasticity without overdosing either agent. The goal of this study is to evaluate the continued efficacy of repeated SEMLC in children with spastic cerebral palsy (SCP). Setting: Pediatric rehabilitation clinic. Participants: 90 children with SCP mean age 7.32 years; 11% hemiplegia, 23% diplegia, 8% triplegia, 58% quadriplegia, baseline gross motor function classification system (GMFCS-E) level: I 11%, II 25%, III 18%, IV 23%, V 23%. Interventions: SEMLC using BTX-A with or without 5% phenol/45% alcohol. Main Outcome Measures: Modified Ashworth scale (MAS) and range of motion (ROM) at pre- and post-procedure. Level of Evidence: 1. Results: 249 SEMLC procedures were reviewed: 77% used BTX-A plus phenol/alcohol and 23% used BTX-A only. Fifty-one patients received 2 SEMLC, 22 received 3 SEMLC, and 17 received > 3 SEMLC procedures. The mean total dose of onabotulinumtoxin-A was 282.35 units 12.44 units/kg. There was significant improvement of MAS and ROM after the procedures (p < 0.001). The mean improvement in MAS and ROM after the first procedure was not different from after the last procedure (p > 0.05) and the same result was observed in subgroup-analysis: a group with 2-3 procedures and a group with >3 procedures. No functional deterioration was observed in the mean follow-up-period of 14.35 months; 14% showed improvement while 86% maintained their current GMFCS level. Conclusions: SEMLC using BTX-A with or without 5% phenol/45% alcohol in improving spasticity and ROM were continuously effective with repeated injections even after >3 rounds of SEMLC.

No. 292 Biomechanical and Clinical Correlates of Stance-Phase Knee Flexion in Individuals With Spastic Cerebral Palsy and Flexed-Knee Gait. Dong-Wook Rha; Jessica Rose; Katelyn Cahill-Rowley; Jeffrey Young.

Disclosure: None. Objective: Flexed-knee gait is a common problem in children with cerebral palsy (CP). The aim of this study was to identify the clinical and biomechanical parameters that influence knee flexion angle at initial contact (IC) and single limb support (SLS) phase of gait in spastic CP. Design: Retrospective analysis. Setting: Gait analysis data from patients with spastic CP who had no prior surgery were retrospectively analyzed. Participants: Exhibiting knee flexion ≥ 20° at IC were included; the more involved limb was analyzed. Knee flexion at IC and minimum knee flexion angle during SLS of gait were analyzed with respect to clinical findings including passive range of motion, selective motor control assessment for the lower extremity (SCALE), gait kinematics, and muscle-tendon lengths during gait. Participants: Thirty-four participants were included (20 males 14 females; age 10.1 ± 4.5 years; GMFCS: level I 14; level II 18; level III 2). Interventions: Not applicable. Main Outcome Measures: Correlation coefficients between knee flexion angles during stance and various biomechanical parameters. Level of Evidence: Level 2. Results: The level of GMFCS correlated more strongly to knee flexion at IC than during SLS. Knee flexion at IC correlated with a lower SCALE score and later peak knee flexion during swing. Knee flexion during SLS correlated to knee flexion contracture and shorter muscle length of posas, semimembranosus, and medial gastrocnemius. Conclusions: Clinical and kinematic correlates of knee flexion at IC differ from those for knee flexion during SLS. These differences may have important implications for treatment. Results indicate that selective motor control and timing of peak knee flexion angle in swing were important determinants of knee flexion at IC.

No. 293 Constipation in Children With Congenital Spinal Cord Injury (Myelomeningocele) Is Physiologically Different Than Constipation In Children With Intact Spinal Cord? Concepción Guadalupe Santillán Chapa; Richard Awad, MD MSc.; Santiago Camacho.

Introduction: It is suggested that an intact neural transmission between the spinal cord and higher centres is essential for noxious stimulus but not for non-noxious stimuli that adult patients with constipation present post-prandial (PP) visceral hypersensitivity and that constipation may not be related solely to continuity of the spinal cord. Methods: Twenty six myelomeningocele (MMC) children (9±2.5 years injury T6-S1 0.9±1 bowel movements per week) with congenital spinal cord injury (SCI) and 16 children (9±2.3 years 1±0.4 bowel movements per week) with idiopathic constipation (IC) were compared with 14 healthy subjects. Rectal sensory thresholds and tone in fasting and PP states were evaluated with a Barostat (GEj on CA) using the ascending method of limits. Mean±SD binomial 95% confidence interval and paired and nonpaired Student two-tailed t test with alpha=0.05. Results: Compared with controls, MMC children showed fasting and PP rectal tone at lower volumes. The PP threshold for the non-noxious stimuli of urge-to-defecate sensation was lower in IC children. PP pain sensation was reported by both MMC and IC children at lower pressure than controls. Conclusion: Constipated children with congenital SCI preserve rectal sensation but present with impaired rectal tone and impaired response to food; IC with intact spinal cord present impaired response to food and both present PP visceral hypersensitivity. The results also suggest that an intact neural transmission between the spinal cord and higher centres is not essential for noxious and non-noxious stimuli and that constipation may not be related solely to continuity of the spinal cord. If the enteric nervous system acts locally by means of intrinsic excitatory and inhibitory pathways, the pharmacological approach must be redirected to act in a localized delivery manner.

No. 294 Rectal Tone and Sensitivity in Fasting and Fed States in Children With Myelomeningocele. Concepcion Guadalupe Santillan Chapa; Richard Awad, MD MSc.; Santiago Camacho.

Background: Constipation and fecal incontinence are common in patients with myelomeningocele (MM). Methods: We have evaluated tone and sensitivity of the rectum in both fasting state and postprandially using an electronic barostat in 29 children aged 6 to 16 years. Twenty-one patients (72.4%) had constipation and eight (27.5%) had fecal incontinence. Paired and non-paired Student two-tailed t test mean ± SD. Results: Fasting vs. postprandial showed no differences in rectal tone. Rectal sensation was perceived in 73.9% of the lumbar group and in 50% of the patients with thoracic and sacral lesions. Postprandially, lumbar patients felt painless sensation with less pressure. Constipation vs. incontinent children showed different rectal tone during both fasting (36.7 ± 24 vs. 89.7 ± 74 ml, p<0.05) and fed (31.1 ± 13 vs. 99.7 ± 82 ml, p<0.05) state. Rectal sensitivity was not different within both groups. Conclusions: These results suggest that most MM children preserve rectal tone and sensitivity and colonic response to food and that constipation, fecal incontinence, and site of lesion modify rectal behaviour in patients with MM.

No. 295 Pediatric Use of Botulinic Toxin in Facial Palsy. A Case Report. Torres Serrano Alejandra Del Rosario; Marcela Rosalba Mosco Peralta; Gabriela Fernandez Hernandez.

Evidence Level: 3 Setting: Tertiary care pediatric hospital. Patient: A 3-year-old girl with right facial paresis as surgical sequelae of
right parotid hemangiomma resection. **Case Description:** Female who was born with a right parotid hemangiomma treated with propanolol during 7 months from 4 to 11 months of age. Angiolyt was performed at 11 months of age showing a wide parotid lesion with enlarged vessels. Surgical management was performed leaving right facial nerve paralysis as a sequela. The patient received botulinum toxin type A injections reconstituted with 0.9% normal saline to a concentration of 10U/0.1 cc. A total of 24 UI were used. The toxin was injected in left facial muscles 3 units per muscle: orbicularis oculi, risorius, levator labii superioris, canino orbicularis oris in two points depressor anguli oris mentalis. The goal of treatment was to improve symmetry at rest the hyperfunctioning side (the non-paralyzed). The improvement was demonstrated photographically. No side effects were reported. **Discussion:** There are many reports of the use of botulinum toxin in adults to treat facial palsy, but there are no reports of its use for facial palsy in children. We considered that it is a good tool for treatment because children have better capacity for recovering if early intervention is done and we will have better results. **Conclusion:** In patients with facial palsy the healthy side becomes hyperactive as a compensative mechanism this increases asymmetry and affects recovery of the affected side because the healthy side hyperactivity limits weak muscles function. In this case we achieved better symmetry.

**No. 296 Manufacture and Validation of a Posture-Measuring Device for Detection of Postural Defects in Pediatrics.**
Torres Serrano Alejandra Del Rosario; César Iván Ramírez Portillo; Mario Enrique Rendón Macías; Marcela Rosalba Mosco Peralta.

**Evidence level:** 2. **Disclosure:** None. **Objective:** Validate the use of a posture-measuring device “posturographer” for detection of the principal postural defects in pediatric population. **Methods:** The present study includes 4 phases: 1) device construction, 2) evaluation of usage consistency among multiple observers, 3) comparison with the reference standard defined diagnosis by an expert with the use of postural cuadricula. **Participants:** For phases 2 and 3 we evaluated 60 children aged between 4-10 years from Pediatrics Hospital CMN XXI, 31 with postural defects and 29 controls. **Analysis:** The inter-observer consistency was determined by kappa index. Additionally, we performed calculations of sensitivity, specificity, and precision for the usage of this device. **Results:** Posturographer was evaluated by experts as a reliable device feasible for usage in clinical practice satisfying current diagnostic needs in pediatric consult. Inter-observer consistency was excellent. Validity criteria were independently assessed by multiple observers: observer 1 reached sensitivity and specificity of 100%, observer 2 reached sensitivity 96% and specificity 100% and 99% of global precision. **Conclusions:** The posturographer proved to be a reliable device for detection of postural defects in children aged 4-7 years. Additionally its usage was evaluated as feasible for pediatric assessment due to its measuring precision and efficiency: we suggest to spread its usage because it is inexpensive and easy to apply.

**No. 297 Cerebral Palsy: Association of Cranial Magnetic Resonance Imaging With Clinical Levels of Disease.**
Jorge R. Vásquez-Ríos, MD; Carlos P. Viñas-Labañino, MD; Saúl R. León-Hernández; Ana Cortés-Rubio.

**Disclosure:** None. **Objective:** To identify cranial magnetic resonance imaging (MRI) findings and the possible association with ambulatory ability of patients with cerebral palsy (CP) according to the gross motor function classification system (GMFCS). **Design:** Transversal descriptive observational study. **Setting:** Tertiary care rehabilitation hospital pediatric rehabilitation unit. **Interventions:** Not applicable. **Participants:** A total of 284 MRI tests in children diagnosed with CP (174 male 110 female; age 2-11 years). **Main Measures:** The findings were divided in 5 groups with alterations and 1 without abnormalities. Clinical forms were classified according to the motor defect, topographic condition, ambulatory level, and the presence or absence of cognitive and sensory disorders. Statistical descriptive square chi, odds ratio, and binary logistic regression were performed. **Disclosure:** SPSS version 15.0 was used. **Results:** The spastic and mixed forms of CP had higher proportion of combined abnormal findings than pure dystonic and ataxic forms (0.0001); non-ambulatory patients had an OR 1.9 (95% CI 1.2-3.2) than ourpatients presenting 2-4 combined findings (p = 0.009). The non-ambulatory group with 2-4 MRI findings was associated with a higher prevalence of associated disorders. **Conclusions:** There is a direct relationship between the extent of cerebral involvement found by MRI and ambulatory status of patients with CP. The results of MRI in children with CP are commonly abnormal and can help determine the etiology and severity of brain injury and generate implications for counseling and intervention strategies.

**No. 298 The Transform of Age Above 3 Years Old Normative Data of Chinese Child Development Inventory in Taiwan in 3 Decades.**
Hsin-Chi Wu; Chen-Chin Hsu; Bin-Han Huang; Shu-Hui Wen.

**Background/Purpose:** The aim of this study was to describe the construction of new Chinese child developmental inventory (CCDI) normative data using a contemporary sample on 3-6.5 years old children and compare with the pre-existing normative data for CCDI. **Methods:** A total of 552 children aged 36.5 to 75.5 months from 30 kindergartens located in 3 districts (Xindian, Jhonghe, and Yonghje) of New Taipei City were assessed using the CCDI. Main caregivers completed questionnaires evaluating the children’s development and demographic information. To compare with the pre-existing normative data for CCDI, the quadric linear regression model was adopted. Additionally smoothed percentile curves (5th to 95th) were estimated by the lambda-mu-sigma (LMS) method. **Results:** The updated mean scores had better general development than the pre-existing norm constructed in 1978. Among eight dimensions of CCDI, average scores in comprehension-conceptual, fine motor, and situation comprehension were larger than the pre-existing norm. However child development in gross motor dimension is slightly getting worse. No differences in self-help were noted between the updated and previous norm. **Conclusion:** Normative data of CCDI will provide a valuable yardstick for physicians and clinicians with an updated tool for child development assessment in Taiwan.

**PROSTHESES ORTHOTICS AND ASSISTIVE DEVICES**

**No. 299 Qualitative Study to Determine Value and Satisfaction of Satellite Prosthetic Rehabilitation Services.**
Sunil J. Ankolekar; Jeffrey Alan Lindsay.

**Objective:** The number of amputee and limb deficient people is increasing worldwide leading to additional demands on prosthetic services. Prosthetic rehabilitation is a long process and continuity of care is very important. Our centre runs a hub and spoke model with a regional centre based at one city and satellite prosthetic services delivered at nearby towns. The aim of this study is to determine the value and satisfaction of satellite prosthetic rehabilitation services. **Design:** An exploratory qualitative study using a structured questionnaire. The design is intended to gain subjective data about feelings and opinions regarding the quality of satellite prosthetic services. **Setting:** Satellite prosthetic clinics at three centres. **Participants:** Voluntarily...
No. 300 Evaluation of Factors That Impact Functional Independence in Children at a Pediatric Clinic in Mexico.
Samuel Bucior; Maria Toro; Jonathan Pearlint; David Dausey.
Disclosure: None. Objective: Compare the characteristics of children who use wheelchairs, walkers, prosthetics and orthotics (collectively referred to hereafter as assistive technology or AT) with children who do not use AT. Determine what factors relate to the functional independence of children with disabilities. Design: Retrospective study. Setting: Pediatric rehabilitation facility in Guanajuato, Mexico. Participants: De-identified patient entries with complete functional independence measurement for children (weeFIM) scores and diagnosis category information (n = 2651) were used for analysis. Patients were mostly male (58.5% n = 1552) had low socioeconomic status and had a median age of 3.10 (IQR: 6.52) years at first evaluation and 5.68 (7.26) years at final evaluation. Interventions: Not applicable. Main Outcome Measures: weeFIM score. Level of Evidence: Level II evidence. Results: The population of AT users differed significantly from the population of non-users, AT users had lower weeFIM scores at final evaluation (p ≤ 0.001), were older at both initial and final evaluations (p ≤ 0.001), had more services prescribed (p ≤ 0.001), and lived further from the facility (p ≤ 0.001). Socioeconomic status and diagnosis categories significantly varied with AT use (p ≤ 0.001) and gender and AT use were also significantly correlated (p ≤ 0.05). Increased final weeFIM scores were significantly associated with initial weeFIM scores, services prescribed, and diagnoses other than cerebral palsy and neurologic diagnoses; and decreased weeFIM scores were significantly associated with initial age and AT use (adjusted r² = 0.586 f = 0.313.495 p ≤ 0.001). Conclusions: Our results suggest that tailoring patient care based on diagnosis may improve functional independence. For instance patients with cerebral palsy or those who use AT are associated with lower functional independence and may benefit from more tailored care and services. While the negative association between age and weeFIM scores contradicts previous studies, our results also suggest that the weeFIM may not be sensitive to improvements in functional independence granted by AT.

No. 302 Complications of Leiomyosarcoma: Right Interscapulothoracic Disarticulation.
Adriel Cuevas; Concepcion Cuenca; Rocio Vacas; Idoya Barca.
Location: Hospital Clinico San Carlos in Madrid. Disclosure: None. Setting: Regional and national reference hospital. First level hospital. Patient: 37-year-old male patient with soft tissue tumor. Case Description: Patient with history of repeated resections of subcutaneous leiomyomas in right elbow who was diagnosed in 2004 with axillary leiomyosarcoma; excision and radiation therapy were performed in the area. Lung metastases appearance in 2006 treated by right upper lobectomy and chemotherapy and right sacral metastases treated with radiotherapy. Presenting axillary and humeral head tumor recurrence, resection was performed in 2011 by blocking the proximal end of the humerus and the glenohumeral joint using oncolytic prosthesis. New periprosthetic tumor recurrence culminated with interscapulothoracic disarticulation in 2013 and adjuvant chemotherapy. Results: Patient referred to our rehabilitation service for prosthetization. Fitting and adaptation of aesthetic prosthesis was prescribed to improve the balance in the scapular girdle as well as contralateral thoracolumbar pain and body image improvements. The components of the prosthesis are lace thermoplastic hemicast with inner Seallux coating for skin contact, endoskeletal structure shoulder and elbow joint structure with manual release endoskeletal wrist and prosthesis hand. Discussion: The LH is a very aggressive tumor with poor prognosis despite radical surgery. The use of radiotherapy and chemotherapy are useful to reduce the size of the tumor and treat recurrences. Conclusions: It is important to restore functionality of the patient after radical amputations as well as symmetry and aesthetics to use regular clothing and avoiding pain due to uncompensated overload weight of the non-amputated area.

Adriel Cuevas; Concepcion Cuenca; Idoya Barca; Rocio Vacas.
Setting: San Carlos University Hospital. Patient: 48-year-old female patient with D6 incomplete spinal cord injury and transfemoral amputation of vascular cause. Case Description: Patient with modified rectangular fitting prosthesis with ischial seat locked knee and waist belt extension by shortness of stump length and by spasticity secondary to her spinal cord injury and tendency to abduction of the left stump, requiring long KAFO with Suiz-type knee lock in paretic lower limb. Patient was referred to the San Carlos University Hospital from primary care for adaptation follow up of orthotics-prosthetics and mild right knee pain without history of trauma. Physical Examination: Swelling, deformity and instability of right knee MB: posas 2/5, quadriceps 3/5, triceps surae 2/5, tibialis anterior 1/5, long extensor of big toe 1/5. An urgent knee x-ray was requested showing a right comminuted tibial plateau fracture. The patient was derived to traumatology evaluation and finally underwent a total hinged knee revision arthroplasty. Results: Soon after surgery the patient began physical therapy in order to improve range of motion and muscle strength of the right leg starting with non weight bearing exercises follow by weight bearing ones. Required fit renovation due to patient’s weight gain due to immobility and the increased volume of the stump. The patient received treatment with bisphosphonates and calcium plus vitamin C at discharge the patient got the same activity level than previously. Discussion: The most common complication of osteoporosis in spinal cord injury is spontaneous fracture with minimal trauma which leads to increased morbidity and disability. Conclusion: It is important to facilitate the social and professional reintegration in patients with spinal cord injury if possible.

No. 304 Acquisition of Assistive Technology in Children With Motor Disabilities: Based on a Cohort Study.
Jessica De Santiago; Francisco Anaya; Erick Madrid; Karla Bustamante.
Disclosure: None. Objective: To evaluate the need for acquisition of and accessibility to assistive technology devices by children with
motor impairments in the state of Chihuahua, Mexico. **Design:** Cohort study. **Setting:** Non-profit organization helping children with disabilities. **Participants:** Children with disabilities such as cerebral palsy, hip dysplasia, myelomeningocele, scoliosis and clubfoot who present with motor impairments. **Interventions:** A database was formed from data collected first by chart review and then phone interview using a standardized questionnaire. Data collected included the type of assistive technology devices required. The interview also evaluated the acquisition method of these devices and the numbers of patients that still need devices but lack access to them. The interview was recorded and an informed consent was previously required. **Main Outcome Measures:** The data were analyzed by an epidemiological software. **Level of Evidence:** Level 2. **Results:** As the population of this study contains a heterogeneous group of diseases, it is important to organize the results by disease. The interview results show that out of 42 patients with cerebral palsy, 58.5% need an assistive device. Out of the 52 patients with hip dysplasia, 17.3% need an assistive device. The entire population with myelomeningocele showed a need for assistive devices. Out of 18 patients with scoliosis, 27.8% need external assistance and out of 42 clubfoot patients, 30% need an assistive device. Lastly, 33.5% of the remaining 111 patients who have other diseases need an assistive device. The major acquisition form of these devices by those who had them was 42.4% by direct purchase and 57.6% by donation or loan. **Conclusions:** A substantial need for assistive devices by children with motor disabilities exists. A lack of rehabilitation engineering decreases the availability of such devices thereby increasing their price. The patients and their families often cannot afford what is available to them.

No. 305 Energy Expenditure and Walking Speed in Lower Limb Amputees: An Old Problem Revisited Again.

**Teuta Osmani Vilasollzi; Beti Zaftrova; Ardiana Murtezani; Bukurije Rama.**

**Study Design:** Prospective cross-sectional. **Study Background:** Although there are many aspects of walking on which the clinician might focus, energy expenditure and walking speed often have been recommended for use as a measures of status and outcome. **Objectives:** The objective of this study was to measure the physiological cost index (PCI) and comfort walking speed (CWS) at three levels of lower limb amputation: transfemoral, transtibial, and at Syme level and the relation of these physiological variables with prosthetic ambulation supported with walking aids and stump length. **Methods:** The eighty-nine individuals with lower limb amputation for reason other than peripheral vascular disease (PVD) were recruited among patients at the Department of Prosthetics and Orthotics at the University Clinical Center of Kosovo. The PCI was assessed by five minutes of continuous indoor walking at CWS. **Results:** There were found significant differences in PCI (f =29.87 p<0.001) and CWS (f=19.33 p<0.001) between three amputation groups. Prosthetic ambulation supported with crutches showed an important impact in PCI (f= 35.1 p<0.001) and CWS (f=28.42 p<0.001). Stump length resulted in significantly increased PCI (r=0.53 p=0.02) and reduced CWS (r=0.38 p=0.04) in transfemoral amputees. **Conclusions:** PCI and CWS were significantly determined by level of amputation and prosthetic walking supported by walking aids. **Clinical relevance:** From existing literature it is difficult to extrapolate the comparison of the energy cost of walking at three level amputation of lower limb. To our knowledge this is the first study comparing the energy expenditure in three levels of amputation: transfemoral, transtibial, and Syme due to reasons other than PVD.

No. 307 The Impact of Wheelchair Provision in a Less Resourced Setting.

Maria Luisa Toro; Jonathan Pearlman, PhD.

**Disclosure:** None. **Objective:** To investigate the impact of wheelchairs (WC) provided to individuals with mobility impairments and how the WC provided relates to WC breakdown measures of participation, quality of life, health status, and WC skills. **Design:** Controlled longitudinal study. **Setting:** WC provision centers in Yogyakarta, Indonesia. **Participants:** 323 people with mobility impairments (and their caregiver when applicable) were interviewed. 146 received a WC and 177 were on a waiting list for one. **Interventions:** A WC provided with associated services compliant with World Health Organization 8 Steps WC Service Provision. **Main Outcome Measures:** Baseline and approximately 6-month follow up were taken. Demographics information Craig handicap assessment reporting technique, short form wheelchair assessment checklist, World Health Organization WHOQOL-BREF, functional mobility assessment, and wheelchair skills test questionnaire translated into Bahasa Indonesia. **Level of Evidence:** 2. **Results:** 165 had cerebral palsy, 44 spinal cord injury, 28 post polio, and 86 other conditions. Of those who received a WC, 62 received a pediatric WC, 46 a rough terrain WC, 29 hospital-style WC, and 5 other type of WC. Impact of WC provision varied across WC type and between control and the intervention group and over the different time points. **Conclusions:** The findings from this study will inform efforts to improve the quality of WC and the WC provision process. They will also provide insight on the impact of WC provision on the quality of life of people with mobility impairments in a less resourced setting.

REHABILITATION IN HEMOPHILIA

No. 308 Effectiveness of Training Program in Open Waters Pool and Land Exercise in Adolescents With Hemophilic Arthropathy.

Gibraltar Conde Aideé; Adolfitna Berges Garcia; Sergio Gadea Gómez; Miguel Angel Gutierrez Agama.

**Disclosure:** None. **Objective:** To evaluate the effectiveness of a training program of swimming in open waters in the pool and land exercise. **Setting:** Training program in open waters pool and land exercise for 10 months. **Participants:** Adolescents with hemophilia A or B. **Main Outcome Measures:** Three measurements were made with scale hemophilia joint health score (HJHS 2.1). **Evidence level:** 2. **Results:** Of adolescents included 80% had hemophilia A (moderate and severe) and 20% hemophilia B (severe). The joints with the most damage were the elbows and ankles. There was a reduction in the HJHS 2.1 between the second and third measurements, statistically significant difference (p < 0.05). The items that showed significant differences were edema in elbows and muscle strength in ankles. **Conclusions:** The training program in open waters pool and land exercise are effective to decrease the severity of hemophilic arthropathy in adolescents.

REHABILITATION OF PATIENTS WITH SPINAL CORD INJURY

No. 310 Gait Analysis in Children Affected By Myelomeningocele After Kinesiology Taping Method in Lower Extremities.

Francisco Anaya; Hector Rentería; Karla Bustamante; Sandra Montes.

**Disclosure:** None. **Objective:** To analyze the immediate effects on gait using kinesiology taping in lower limbs in children with
No. 311 Systemic Vasculitis Accompanied by Syringomyelia: A Case Report.

Mehmet Ali Taskaynatan (Gulhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, Ankara, Turkey).

Disclosures: None. Setting: Tertiary care university hospital. Patient: A 26-year-old male with upper extremity weakness. Case Description: A 26-year-old patient was admitted to our department with complaints of upper extremity weakness for two months. There was no history of trauma and family history wasn’t contributory. He stated that intestinal resection was performed and he was diagnosed with empyema. On physical examination the patient was mobile in short distances. Muscle strength were as follows; left C4 myotome was 4/5, bilateral C5 myotomes were 3/5, bilateral C6 and C7 myotomes were 2/5, bilateral C8-T1 myotomes were 1/5. Bilateral wasting of thenar and hypothenar eminences and dorsal interossei were inspected. Assessment/Results: Cervical magnetic resonance imaging showed syrinx cavitation between C5 and C7 levels. Electromyography indicated lower motor neuron affection (C4-T1). Computed tomography findings revealed cavitating lesions in the right lung. Cyclophosphamide and prednisolone were prescribed as medical treatment. Neurehabilitation process is started. A remarkable motor and functional recovery is obtained in a short time. Discussion: Systemic vasculitis is a clinical condition which is generally characterized by the inflammation of small and medium sized vessels. The disease may affect multi organ systems and may be accompanied by various disorders. If central nervous system (CNS) involvement is suspected, proper radiological assessments should be performed for confirmation of the diagnosis. Conclusion: Clinicians should take into account vasculitis associated syringomyelia in differential diagnosis of upper extremity weakness problems in vasculitic patients. Reprinted with permission.

No. 312 Can Spinal Cord Injury Patients Show a Worsening in ASIA Impairment Scale Classification Despite Actually Having Neurological Improvement? The Limitation of ASIA Impairment Scale Classification.

Ibrahim Gundogdu, MD; Ethem Arif Cazir, MD; Koray Aydemir, MD; Fatma Aybul Calcul, MD; (Ministry of Health, Ankara Diskapi Yildirim Beyazit Education and Research Hospital, Ankara, Turkey); (Gulhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, Ankara, Turkey).

Disclosure: None. Objective: To demonstrate the possible problems with ASIA impairment scale (AIS) classification in spinal cord injury (SCI) cases involving presumed motor and sensory changes and to clarify the possible causes of the inverse relationship between the motor/sensory changes and AIS conversion in certain conditions. Borderline AIS grades are most problematic when determining AIS classification. Design: The analysis of SCI case examples for the probable AIS grade changes in the event of recovery. Setting: Tertiary care education and research hospital. Participants: SCI patients. Main Outcome Measures: Neurological examination (motor/sensory) findings and AIS grades. Results: We encountered the same unique problem of deteriorating AIS grades within the critical zones of conversion when presumed neurological improvement took place and vice versa. Conclusions: This is the first report which analyzes the structure and definitions in the AIS standards for possible causes of the inverse relationship between the motor/sensory changes and AIS conversion. When recovery occurs without observing any motor or sensory changes while taking only the AIS into account, it would be possible to make an incorrect conclusion. This is most likely an indication of a limitation of the AIS. To enlighten this paradox the large amount of data in SCI databases should be reanalyzed. Reprinted with permission.

No. 313 Recuperacion Neurologica Y Funcional De Pacientes Con Lesion Medular Por Tumoracion Intrarranqueida.

Aída Barrera Ortiz; Dra. Del Refugio Pacheco Gallegos; Saül Renán León Hernández; Ramiro Pérez Zavala.

Objetivo: Determinar los factores asociados a recuperación neurológica y funcional de pacientes con LMT. Material y métodos: Estudio de cohorte histórica de pacientes de un instituto nacional de salud con diagnóstico de LMT de enero del 2000 a diciembre 2010. Variables: escala de la American Spinal Cord Injury Association (ASIA) y la medida de independencia funcional (FIM). Se aplicó estadística descriptiva univariante los análisis bivariantes incluyeron chi cuadrada o test exacto de fisher rangos de Wilcoxon u de Mann Whitney y análisis de varianza de un factor para comparar tres o mas promedios de una variable con distribución normal. La normalidad de las distribuciones se contrastó con la prueba de Kolmogorov-Smirnov. Para el análisis multivariado se aplicó regresión logistica con el método de wald hacia atrás. Intervenciones: No aplicable. Resultados: 68 expedientes 52% femenino edad promedio de 46±16 años. Inicio de rehabilitacion promedio 8.6 meses. Intradural extramedular (44.1%) meningioma (26.5%) torácico (77.9%). El ASIA posterior al tratamiento presentó un cambio significativo (p= 0.0001) asociado a manejo hospitalario tratamiento quirúrgico en el instituto y presencia de úlceras. El cambio de FIM inicial y final con diferencia significativa (p= 0.0001) estuvo asociado a manejo hospitalario tipo de tumor tratamiento quirúrgico y cirugía en el instituto. La regresión logistica binaria selecciono como factores pronósticos al manejo hospi
talar tiempo de inicio de la rehabilitación y tiempo que el paciente permanece en rehabilitación. Conclusions: Las LMT afectan a poblaciones en edades productivas. Los factores asociados a mejor recuperación son manejo hospitalario tiempo de inicio y de seguimiento en rehabilitación. Nivel De Evidencia: 2.
No. 315 Removal and Reimplantation of Intrathecal Baclofen System Provides Safer Treatment for Infected Catheter in Meningitis. A Case Report.
Tetsuya Enishi; Masanori Inalsugi; Nori Sato; Shinsuke Katoh.

Introduction And Aims: Baclofen is a centrally acting gamma-aminobutyric acid B agonist used to treat severe spasticity such as spinal cord injuries (SCI). Intrathecal baclofen (ITB) therapy has become the treatment of choice for refractory spasticity. However the infection of the system and failure of implanted pump are subject to numerous complications. Here we report the successful treatment for infected ITB system and the usefulness of the system for spastic paraplegia. Material and Methods: A 35-year-old healthy woman presented with spastic paraplegia due to syringomyelia. After successful trial bolus injection of baclofen, ITB system was implanted. Nine months later she felt headache and fever up in hospitalization. Intravenous antibiotic treatment was started with ceftriaxone sodium hydrate in combination with gentacin. Results: Removal of ITB system was performed. The pump was not infected but the catheter was surrounded by infected scar. Four months after removal, ITB system reimplantation was performed to control severe spasticity. Conclusion: Removal and reimplantation of intrathecal baclofen system provides more safe treatment for infected catheter in the case of meningitis.

No. 316 Bone Mineral Loss After Spinal Cord Injury.
Belgin Erhan; Ebru Yilmaz Yalcinkaya; Berkin Gunduz; Hulya Aslan; Fatih Kahraman.

Introduction: Bone mineral loss is a common complication seen after spinal cord injury (SCI) which leads to fractures that increase the mortality and morbidity. The aim of this study was to investigate the incidence of bone mineral loss in our SCI patients and its relationship between clinical and demographic features. Methods: A hundred SCI patients with an injury duration longer than 2 months were enrolled in this study. The patients under osteoporotic treatment or who had heterotopic ossification in the areas evaluated were excluded. Demographic features ASIA impairment scale (AIS), walking index for spinal cord injury (WISCI-II), dual-energy x ray absorptiometry (DXA), laboratory findings were recorded from the patients’ files. Descriptive statistics, Pearson and Spearman correlation, independent t-test were used for analyzing data. Results: There were 57 male and 43 female patients with a mean age of 45±15.4 years and median injury duration of 35 months (2-480). Forty eight patients had motor incomplete injury and 67 were paraplegic. Forty patients had a Z score lower than -2.5 at least in one region evaluated. The lowest Z scores recorded among all sites were the leg and femur total Z scores, respectively. Leg and femur total Z scores were positively correlated with AIS and negatively correlated with injury duration. Male patients had significantly higher Z scores in the lumbar region. Arm Z score was negatively correlated with AIS and positively correlated with injury level (C4-L4). In the bone mineral density values femur total was positively correlated with WISCI-II and ambulation time, femur total and neck values were negatively correlated with age. Conclusion: Our results were similar to the literature; 40% of the patients had bone mineral loss most prominent in the leg and femur. Bone mineral loss was correlated with the severity and duration of the injury, age, ambulation time, and WISCI-II scores. Among these factors increasing ambulation potential should be highlighted.

No. 318 Development of Automatic Clean Intermittent Urine Catheterization Device for Paraplegia Patients With SCI: Prototype.
Sei Joo Kim; Joon Shik Yoon; Seung Nam Yang; Seok Kang.

Background: Because of the weakness in bilateral upper/lower extremities, autonomic nervous system dysfunction, and uncontrolled bladder/bowel system, it is difficult for patients with cervical spinal cord injury to perform activities of daily living (ADLs). Especially about voiding difficulty patients should insert a catheter (a tube to drain the urine) intermittently for emptying their bladder which is called clean intermittent self-catheterization (CIC). However it is almost impossible for the patients with high cervical cord injury to do CIC by themselves. Bladder control as one of the ADLs could be more related with quality of life (QOL) than any other ADLs. If the patients perform CIC independently, it could much improve QOL of the patients as well as the caregivers. The aim of this study was to develop the automatic device for performing CIC in male patients with cervical spinal cord injury. Method: We decided to use motor system for inserting urethral catheter to the bladder which has gel-sterilization system at catheter insertion area. First patient should be ready for catheter by catheter-guided device inserted at the urethra. When patients push the start button for voiding, catheter-guided device would dock with catheter by catheter rail. Then it would pass through sterilization step and be transferred incrementally to the bladder by stepper motor until pre-set length reached. After fully voiding, same process would be repeated in reverse. Finally, voided urine would be collected at a separate storage continuing with main device. Results: We developed developmental prototype of the autonomic intermittent urine catheterization device with self-sterilizing method. It could help patients with spinal cord injury to perform catheterization by themselves and to improve their quality of life. Conclusion: Further studies for clinical implementation are needed in patients with cervical spinal cord injury who needed CIC for evaluating of safety and effectiveness.

No. 320 Effects of Transvertebral Direct Current Stimulation in Healthy Humans: Early Results From an Ongoing Randomized Cross Over Study.
Radha Korupolu, MBBS MS; Elizabeth Salomon, MS; Lakshmi Reddy; Lumy Sawaki.

Objective: Non-invasive transcranial direct current stimulation has been shown to modulate cortical excitability in various studies. Recent preliminary studies suggest transvertebral direct current stimulation (TVDCS) may engender a similar modulation effect on spinal neurons. Promising adjuvant treatment options when paired with locomotor training may therefore be possible for patients with neurological disorders. Our goal is to study the effects of TVDCS in healthy subjects in order to establish a reliable reproducible TVDCS methodology to modulate spinal excitability in subjects with spinal cord injury (SCI). Long-term goals include evaluating effects of TVDCS paired with locomotor training for subjects with motor incomplete SCI. Design: Randomized crossover study. Setting: Acute inpatient rehabilitation hospital. Participants: Healthy subjects with no history of neurologic disorders. Intervention: We randomized subjects to receive 1 of 3 TVDCS conditions (ie anodal, cathodal, or sham) at an intensity of 2.0 mA for 20 minutes to spinal level T10-T11. For sham, TVDCS intensity was ramped up then ramped down over a thirty-second window in order to evoke a similar sensation as active TVDCS. Main Outcome Measures: Bilateral triceps surae motor evoked potentials (MEPs) elicited by transcranial magnetic stimulation immediately before and after TVDCS. MEPs were recorded at 100-130% of resting motor threshold. Level of Evidence: 2.
Results: Preliminary results indicate a 13% to 70% increase in MEP amplitudes after cathodal stimulation. Sham and anodal stimulation led to a net decrease in MEP amplitudes. Conclusions: Initial results indicate that cathodal TVDCS may increase MEP amplitudes. TVDCS appears to have great potential to modulate spinal excitability and optimize motor recovery in SCI patients in the future.
No. 322 Validation of Customized Assessment Method and Our Outcomes With Interferential Medium Frequency Electrical Stimulation Therapy for Micruntion (Dis-) Control in (Mainly) Post Spinal Cord Injury Patients.
Gelu Onose; Cristina Dalia; Tiberiu Spircu; Lillian Onose.

Objective: Two non-urodynamic classifications were used aiming to compare them regarding their ability to evaluate micruntion (dis-) control (MC) and also the assessment of the efficiency of an interferential medium frequency electrical stimulation (IMFES) standardized related therapeutic method for neurogenic bladder (NB) rehabilitation. Design: Comparison of the quantified classification Bors-Comarr (B-CS; in figures converted) and our own customized scale (OCS; submitted for patenting to the Romanian State Office for Inventions and Marko) for intrinsic and extrinsic validation (see specific tests’ results below) based on a related prospective study.

Setting: The Physical (Neural-Muscular) Rehabilitation Medicine Clinic Division of the Teaching Emergency Hospital “Bagdasar-Arseni” in Bucharest. Participants: 332 inpatients with NB fulfilled between September 2006 - April 2011 the above mentioned survey. Interventions: The cases were divided in two lots: IMFES (162 cases, mean 39.63 years, s.dev. 17.06) and control who have not submitted such a physiopathic procedure (170 cases, mean 39.96 years, s.dev 17.58) all stratified by AIS sensory (SS) and motor (MS) scores. Main Outcome Measures: B-CS/OCS intrinsic: sensitivity (0.82/0.68), specificity (0.48/0.73), test efficiency (0.65/0.71) and extrinsic: Somers (0.921 95% confidence interval-CI-0.909-0.933), Spearman (0.970 95% CI 0.962-0.978); a Cronbach (0.909 95% CI 0.962-0.973), Kendall (0.921 95% CI 0.909-0.933); Pearson (0.949 95% CI 0.939-0.959). Level of Evidence: 2.

Results: The number of inpatients that significantly improved their MC was overall higher in the IMFES lot (mean 365.80 s.dev 488.61) compared to controls (mean 824.94 s.dev 63.22); p<0.001 especially for those AIS B at admission with SS between 160-224 (IMFES: mean 283.09; s.dev 403; control: mean 694.14 s.dev 671.89; p<0.001). Conclusions: OCS is valid for the evaluation of MC and IMFES is useful in the rehabilitation of incomplete SCI patients with NB.

No. 323 Late Rehabilitation in Patients With Traumatic Spinal Cord Injury in a Rehabilitation Center.
Styliani Papakosta; Dimos Galliopoulos, MD; Maria Goutou, PhD MD; Triantaris Apostolos, MD.

Objective: Evaluation of a late rehabilitation program in patients with traumatic spinal cord injury (TSCI). Design: 36 patients with TSCI (24 men) admitted to our rehabilitation center 9 months to 2 years after their injury. Patients never before underwent rehabilitation. Barthel score was estimated in admission and 3 months later. Setting: Rehabilitation center. Participants: Median age was 29 years (range 7-42). 28 patients suffered paraplegia (ASIA: 4 patients Th10C, 9 patients Th12A, 4 patients Th11A, 6 patients Th12C, 6 patients Th6A, and 2 patients L1C). 8 patients suffered tetraplegia (ASIA: 3 patients C4A, 1 patient C5A, 1 patient C6C, 1 patient C7C, 1 patient C8A, and 1 patient C1C). At their admission to our rehabilitation program, median Barthel score was 30 (15-40). Interventions: They underwent rehabilitation program with daily sessions of physiotherapy, occupational therapy, hydrotherapy and nutritional, social, and psychological support for 3 months. We managed their spasticity clonus at the lower extremities, bladder and rectum function, osteoporosis, pain, shoulder, ulnar, neuritis, heterotopic ossification. Pressure sores, infections, and deep vein thrombosis were prevented. Patient underwent gait training and use of wheelchair. In 24 patients we provided a walk-about for daily therapeutic gait. Care givers were also trained in specific care techniques. Main Outcome Measures: Barthel score. Level of Evidence: 2. Results: The neurological level of injury was stable in all patients. However mean Barthel score improved to 65 (range, 50-70) with a significant increase (mean, 35; range, 15-55). Conclusions: Three months after rehabilitation program neurological level of injury was stable. All patients had a significant increase in Barthel score. All patients were educated in management of health problems and self-education at wheelchair use.

No. 324 The Impact of Perceived Health on Autonomy and Participation Among a SCI Population.
Jennifer A. Piatt; Mary Sara Wells; Melissa Zali; Marieke Vanpuymbroek.

Disclosure: None. Objective: This pilot study was developed to test hypotheses that perception of health has an impact on autonomy and participation as defined by the International Classification of Functioning and Disability (ICF) within a SCI population. Setting: Online survey. Participants: 42 adults with SCI currently receiving outpatient services from a rehabilitation hospital completed the online questionnaire. Subjects were categorized into 2 groups: group 1: excellent/very good perceived health and group 2: good/poor perceived health. Main Outcome Measures: Impact on autonomy and participation (IPA) (autonomy indoors, family role, autonomy outdoors, social life, work/education) on a scale of 0 to 4 (from 0 very good to 4 very poor). The lower the score; the higher participation level. Perceived health was examined on a scale of 1 to 5 (from 1 excellent to 5 very poor). Data were collapsed into 2 categorical variables (excellent/very good and good/poor). Results: Results from the MANOVA demonstrated a significant multivariate effect for relationship Wilks’ e.= 0.731 (F36)=34.43 p<.01. Univariate results for the relationship demonstrated a significant effect for family roles p<.02, autonomy outdoors p<.01, social life p<.04, and work/education p<.01. Autonomy indoors did not result in significance. Conclusions: The perception of health among an adult SCI population has an effect on autonomy and participation within the areas of family role, outdoors, work/education, and social life. If perceived health was excellent/very good, subjects scored higher in autonomy and participation.

No. 325 Rehabilitation Program in a Case of Brown-Séquard Syndrome Generated by a Gunshot: A Case Report.
L. Pira José; Chaustre Diego., MD. (Hospital Militar Central Bogotá D.C. Colombia).

Disclosure: None. Patient: A 24-year-old man. Case description: 24-year-old male patient who was wounded by gun fire presented with left-sided hemithorax. After the initial presentation of spinal shock in the first 3 weeks, patient gradually presents clinical signs of Brown-Séquard syndrome. Patient had a persistent dermatome pain level of T7 in his left chest that did not improve with the use of analgesics nor thoracic neurolysis performed by the neurosurgery group. Patient showed a partial improvement in pain. Post-procedure comprehensive management care was continued with physical rehabilitation and occupational therapy to achieve improvement in lower limb strength independent walking without a cane. Functional motor patterns at lower limb muscle tone Ashworth 1 + with persistent hypoesthesia in right leg. Assessment/Results: Currently the patient has total independence in all daily living activities according to the cliniometric scale. Discussion: It should be noted the history of spinal trauma to define the rehabilitation program depending on the time history of the disease. For this reason the patient
No. 326 Changes in Wheelchair Propulsion in Spinal Cord Injured Adults Through Muscular Strength Training Program: A Pilot Study.
Ivette Quiñones Uróstegui; Alejandro Acosta Borbón; Ramiro Pérez Zavala; Evaristo Vela Peña.

Objective: To identify changes in biomechanical parameters after muscular strength training program designed to improve wheelchair propulsion, propulsion symmetry, and their functional outcome using tools commonly used in any sports facility. Six spinal cord injured adult patients participated in a 8-week muscular strength circuit training program: 4 male and 2 female; 2 cervical and 4 high thoracic spinal cord injured. Subjects performed one set of 9-12 repetition maximum upper body strength exercises three times a week based on the characteristics of force production during maximal effort according to González-Badillo (2002). Exercises included shoulder flexion extension (modified rowing), abduction, internal and external rotation, elbow flexion extension, and shoulder flexion/extension (bench press and pulleys). All subjects used their own wheelchair and participated in a 30 second wheelchair propulsion test before and after the 8-week program using an ergometer and a 3D kinematics model designed to measure the biomechanical characteristics of the propulsion as speed (m/s), torque in the wheel (nm), propulsion cycle time, and patterns. The functionality was measured using the functional independence measure (FIM) scale and the Constant-Murley score. Results showed male patients improved significantly in torque (p = 0.06); thoracic injured showed significantly higher velocities (p = 0.01) after training. Significant changes were obtained before and after training in FIM (p = 0.02) and Constant-Murley (p = 0.04) scores: also FIM highly correlates with velocity (Rho 0.90 p = 0.03).

The patterns of propulsion showed marked changes in terms of range of motion and semicircular tendency to double loop. In thoracic patients, patterns became broader and changed semicircular to linear patterns and finally greatly improved symmetry. In all subjects it decreased the heterogeneity. In conclusion this pilot study suggest that a muscular strength-training program with traditional gym equipment can improve torque velocity and functionality. A larger controlled study is warranted.

No. 327 Evaluation of Posture and Its Relationship With Shoulder Pain in Active Wheelchair Users.
Ivette Quiñones Uróstegui; Carlos Jorge González Flores; Ramiro López Zavala; Alberto Isaac Pérez San Pablo.

The objective is to determine shoulder injuries incidence and changes of posture in spinal cord injured patients who are active wheelchair users. 24 spinal cord injured patients; 8 female (33.33%) and 16 male (66.66%), with average of 34 years old. 54% (13) use conventional wheelchairs, and 46% (11) semi-sport wheelchairs. 3 patients (13%) with cervical injury (C5 - C8), 7 (27%) high thoracic (T1 - T6), 10 (42%) low thoracic (T7 - T12), and 4 (17%) with lumbar injury (L1 A L3).

Photographic posture analysis was performed using a digital image acquisition and kinesiology analysis posture module (BAK) Milletrix v.1.0.0.26. The patients were seated on a common chair in order to obtain anterior posterior and bilateral pictures. Anatomical markers were located in anatomical references following the BAK protocol. As results the posture was clinically classified as descend in 45.8% (11), flat posture in 25% (6), short lordosis in 25% (6), and long lordosis posture in 4.2% (1). Patients with less evolution time (1-2 years) adopted flat posture while bigger whereas patients with longer evolution time (> 11 years) tended to adopt descended posture. Predominantly descended position in high thoracic injuries and short lordosis posture in lower thoracic spinal cord injury was found; in lumbar spinal injuries predominated the descended posture. A statistically significant relationship was seen between the use of conventional wheelchairs with descendent and flat postures (p = 0.032). Close relationship between shoulder pain increased with time of evolution (p = 0.022). It can be concluded that spinal cord injured patients active wheelchair users tend to develop descended posture and scoliosis below the level of injury after 11 years of evolution. Descended and flat postures are related to conventional wheelchair over semi-sports.

The main factor associated with shoulder pain in active wheelchair users is that time exceeds 10 years evolution.

Piotr Tederko; Marek Krasuski; Izabella Nyka; Rafał Skrzypczyk.

Purpose: To evaluate the methodological quality of Polish original scientific papers on spinal cord injury (SCI). Type: Systematic literature review. Material: 336 scientific papers dated from 1979 to 2012 extracted from Polish medical bibliography, Medline. Embase. Method: Modified Downs & Black criteria (MDB). Results: 312 papers were excluded as not human studies, reviews, case reports or studies with poorly defined inclusion criteria. 224 papers underwent quality analysis. Mean MDB index was 11.04 (grade scale 0-28). Average score percentages in MDB subscales were for reporting 47.4%; for external validity 57.9%; for bias 41%; for confounding 20.4%; for sample size calculation 0. Prospective studies accounted for 28.1% multicenter studies 31%. Mean number of enrolled patients was 3363. The data obtained are not sufficient to define SCI incidence and morbidity in general population but allow for detailed analysis of causability and mortality of traumatic SCI. Coherent data illustrate time span till 1993. Studies on non-traumatic SCI are scant and methodologically poor. Conclusions: Studies on SCI that can base an epidemiological analysis of SCI and its consequences in Poland do not meet contemporary methodological requirements. The results may serve as a referral point for updated studies. There is a need for a systematic prospective study on SCI epidemiology in Poland.

Piotr Tederko; Marek Krasuski; Izabella Nyka; Rafał Skrzypczyk.

Purpose: To analyze available Polish epidemiological data on spinal cord injury (SCI) according to domains of functioning material. 224 Polish original papers on SCI analyzed in Part 1. Method: Analysis of papers according to International Classification of Functioning, Disability
and Health Complex Core Set (ICF-CS) for SCI and a review of diagnostic tools applied in the studies. Results: Body structures and functions were assessed in 182 papers (81.6%), activities were analyzed in 50 papers (22.3%), participation data were noted in 33 publications (147%), while environmental factors were as evaluated in 34 studies (152%). Discussion: Biomedical aspect of SCI is a leading issue of the vast majority of hospital-based studies on patients in the early period after SCI. Data on functioning refer mainly to aspects of mobility whereas SCI results in multisystemic functional loss and interacts with many daily activities. Few studies deal with hand or respiratory function. Systematic analyses of sensory, circulatory, urological or gastrointestinal function are even less popular. Environmental studies coming from hospital databases are characterized with high dropout (22.4%) and do not allow for assessment of morbidity and SCI related disability impact and its correlations with environmental factors since poor representativeness, low power of studies, and low homogeneity of tools applied. Conclusions: A current prospective cohort study on a population of persons living with SCI should apply tools referring to all categories represented in ICF-CS for SCI. Papers based on an experience of municipal rehabilitation centre dated from the period 1979-1993 are a valuable referral point to more contemporary studies of early rehabilitation of patients with SCI during the first year and to study the temporal course of weight changes in this population. Main Outcome Measures: Included pattern of change in weight, mean change, and temporal course of change in various anthropometric measurements like abdominal circumference (AC), waist hip ratio (WHR), and body mass index (BMI) from baseline (within 30 days of SCI) to the end of one year. Design: Observational longitudinal study of twenty two men with acute traumatic spinal cord injury. Results: The mean body weight decreased from baseline (61.67 & 10.94 kg) at 6 months (57.07 & 9.03 kg) and increased thereafter till the end of one year (58.68 & 10.47 kg). The mean BMI declined rapidly by 1.52 kg/m² at first follow up but showed slight gain by 0.69 kg/m² at the end (p g 0.05). There was a shift in the distribution of persons to lower BMI classification at first follow up changing slightly towards the higher level at the end of study. The mean abdominal circumference showed a minimal increase at 6 months which continued at the completion of study (p 0.05). The mean WHR decreased slightly from baseline (0.85 & 0.08) at first follow up (0.84 &0.06) and again increased after one year (0.87 & 0.06 p g 0.05). Conclusions: Abdominal circumference based markers (waist circumference and waist hip ratio) appear to be better predictor of the development of centripetal obesity and should be used in acute SCI cases for the prediction of obesity risk.

No. 334 A Relationship Between Wheelchair Footrest Elevation and Pressures on Ischial Tuberosities in Paraplegic Subjects.

Piotr Tederko; Tomasz Besowski; Marek Ayg; Izabella Nika.

Objective: To describe the effect of wheelchair footrest height elevating on sitting pressures in paraplegics. Methods: 17 manual wheelchair users with paraplegia underwent seat pressure examination while footrests were elevated from the initial position with the thighs parallel to the seat (P0), by 10% (P10), and by 20% of the fibula length (P20). There were averaged pressure (AP), the contact surface of the body with the seat (CS), pressures on the ischial tuberosities - left (LIP) and right (RIP), and averaged pressure on both ischial tuberosities (AP) analyzed. Results: A gradual increase in footrest elevation was accompanied by significant increase of AP (P0: 57.2±14.31; P10: 60.65±14.85; P20: 62.51±5.3 mmHg; Kendall coefficient of concordance w=0.962) AP (P0: 159.35±54.95, P10: 176.35±53.3, P20: 184.26±54.09 mmHg, w=0.896) LIP (P0: 165.2±45.05; P10: 185.13±52.08; P20: 193.13±56.32 mmHg, w=0.751) RIP (P0: 153.71±71.23, P10: 167.35±71.29; P20: 173.5±70.84 mmHg, w=0.524) and significant decrease of CS (P0: 1218.2±100.8; P10: 1131.8±134.6; P20: 1065±142.6 cm², w = 0.985). Relative increase of LIP and RIP between P0 and P10 and between P10 and P20 have shown moderate correlation (Pearson’s correlation coefficient for LIP r = 0.66, p = 0.04 for Rip r = 0.77, p = 0.003) whereas AIP relative changes have shown high correlation (r=0.87; p<0.0001). Conclusions: Wheelchair footrest elevation caused an even growth in average ischial tuberosity pressure; however left to right side pressure differences changed only suggesting level of pressure ulcers may increase disproportionately with footrest elevation.

No. 335 Do Anthropometric Indices Establish Markers of Obesity Among Spinal Cord Injury Patients?.

Shiv Lal Yadav.

Objectives: To identify the importance of anthropometric indices as surrogate markers of obesity in persons with spinal cord injury (SCI) and Health Complex Core Set (ICF-CS) for SCI and a review of diagnostic tools applied in the studies. Results: Body structures and functions were assessed in 182 papers (81.6%), activities were analyzed in 50 papers (22.3%), participation data were noted in 33 publications (147%), while environmental factors were as evaluated in 34 studies (152%). Discussion: Biomedical aspect of SCI is a leading issue of the vast majority of hospital-based studies on patients in the early period after SCI. Data on functioning refer mainly to aspects of mobility whereas SCI results in multisystemic functional loss and interacts with many daily activities. Few studies deal with hand or respiratory function. Systematic analyses of sensory, circulatory, urological or gastrointestinal function are even less popular. Environmental studies coming from hospital databases are characterized with high dropout (22.4%) and do not allow for assessment of morbidity and SCI related disability impact and its correlations with environmental factors since poor representativeness, low power of studies, and low homogeneity of tools applied. Conclusions: A current prospective cohort study on a population of persons living with SCI should apply tools referring to all categories represented in ICF-CS for SCI. Papers based on an experience of municipal rehabilitation centre dated from the period 1979-1993 are a valuable referral point to more contemporary studies of early rehabilitation of patients with SCI during the first year and to study the temporal course of weight changes in this population. Main Outcome Measures: Included pattern of change in weight, mean change, and temporal course of change in various anthropometric measurements like abdominal circumference (AC), waist hip ratio (WHR), and body mass index (BMI) from baseline (within 30 days of SCI) to the end of one year. Design: Observational longitudinal study of twenty two men with acute traumatic spinal cord injury. Results: The mean body weight decreased from baseline (61.67 & 10.94 kg) at 6 months (57.07 & 9.03 kg) and increased thereafter till the end of one year (58.68 & 10.47 kg). The mean BMI declined rapidly by 1.52 kg/m² at first follow up but showed slight gain by 0.69 kg/m² at the end (p g 0.05). There was a shift in the distribution of persons to lower BMI classification at first follow up changing slightly towards the higher level at the end of study. The mean abdominal circumference showed a minimal increase at 6 months which continued at the completion of study (p 0.05). The mean WHR decreased slightly from baseline (0.85 & 0.08) at first follow up (0.84 &0.06) and again increased after one year (0.87 & 0.06 p g 0.05). Conclusions: Abdominal circumference based markers (waist circumference and waist hip ratio) appear to be better predictor of the development of centripetal obesity and should be used in acute SCI cases for the prediction of obesity risk.

No. 336 The Relationship Between Detrusor Wall Thickness and the Function of Lower Urinary Tract In Patients With Spinal Cord Injury.

Hongjun Zhu; Dawei Zhang; Yunqiang Zan; Weixin Yang.

Objectives: To determine detrusor wall thickness (DWT) with ultrasound in patients with neurogenic lower urinary tract dysfunction (NLUTD) due to spinal cord injury (SCI) and to explore the influence of bladder capacity (BC) and the types of NLUTD on the DWT. The clinical implication of DWT for the prediction of risk factors for renal injury in patients with SCI was evaluated simultaneously Design: Randomized controlled study. Setting: Ultrasound instrument urodynamic examination instrument. Participants: Forty-eight adult patients with NLUTD due to SCI were recruited for the case group and another 41 adults without significant pathologic condition were recruited for the control group respectively. Interventions: All the participants underwent urodynamic evaluation and measurement of DWT. Main Outcome Measures: DWT, maximum bladder capacity, detrusor leak point pressure, maximum urethral pressure, bladder compliance. Results: DWT of SCI subjects decreased rapidly during the first 250 ml of bladder filling, DWT in case group was 0.97±0.31mm and 0.59±0.08mm in control group at MBC (p<0.05). DWT in patients with detrusor sphincter dysynergia (Type A) was 1.10±0.34 mm which was obviously increased compared to DWT in patients with external urethral sphincter contraction without detrusor contraction (Type C) (p<0.05). A remarkable relation between DWT and detrusor leak point pressure was demonstrated r = 0.77 p<0.01. A DWT of 0.87mm (sensitivity 89.5%, specificity 58.6%) could be used as a cutoff point to predict risk of renal injury in patients with NLUTD. Conclusions: DWT in patients with spinal cord injury was increased significantly and positively correlated with detrusor leak point pressure. DWT may be used as a risk predictor for renal injury in patients with NLUTD due to SCI. Reprinted with permission.
SPORTS AND MUSCULOSKELETAL REHABILITATION

No. 337 Upper Limb Neuromusculoskeletal Complications in Patients Using Walking Aids.
Marwa Amer; Tarek Shafshak; Mowaffak Saad.

Objective: To assess the prevalence of upper limb (UL) neuromusculoskeletal complications among patients using walking aids (cane, crutches, and walkers). Design: Survey study. Setting: Referral center. Participants: 1) 53 walking aid users (for 1-264 months), and 2) 52 non-walking aid users of matching age, sex, body weight, and occupation (control group). Exclusion criteria included: diabetes mellitus, hyperuricemia, rheumatological diseases, myopathy, polyneuropathy, previous UL trauma, and those with UL complaint prior to walking aid use. Interventions: 1) rheumatological and neurological examination, 2) examination of the type and specification of the used walking aid, 3) x-ray examination for any UL joint(s) involved by pain, tenderness, crepitus and/or stiffness; and 4) nerve conduction studies for patients suspected to have entrapment neuropathy at their UL. Main Outcome Measures: The percent of subjects with neuromusculoskeletal abnormality in each group. The relation between these complications and some variables. The chi squared, Fisher exact, Mann Whitney, and t-tests were used in statistical analysis. Level of Evidence: Level 1. Results: There was higher prevalence (p<0.05) of shoulder pain, elbow pain, hand pain, epicondyliitis osteoarthrosis of the acromioclavicular joint, and carpal tunnel syndrome among walking aid users compared to the control group. Complications were more common among those ladies with increased body weight, those with longer duration of walking aid use, and those having a walking aid of inappropriate length. Also osteoarthrosis of the first carpometacarpal joint was more common among unilateral crutch users than among those using the walking aid by both hands (i.e. in bilateral crutch users and in those using walkers). Conclusions: Many UL neuromusculoskeletal complications could occur among walking aid users. Some of these complications are preventable by prescribing the appropriate walking aid length and reducing the patient body weight. The physiatrist should take care of these complications.

No. 338 Comparison of the Directional After Effect of Static Contractions Through Different Upper Extremity Position and Different Pinch Force Strengths on Improvement of Maximal Active Range of Motion of Wrist.
Arai Mitsuo; Shiraitani Tomoko; Yanagisawa Ken; Ikeda Makoto.

Objective: To test hypotheses that post-activation after effects after a static contraction (SC) considering the different shoulder joint positions, different pinch-force strength, and the direction of wrist movement would show difference in the improvement of maximal active range of motion (MAROM) of affected wrist joint and that these differences may be related to facilitation of the wrist agonist IEMG activities in patients with orthopedic impairments. Design: Repeated measures design ‘t’ crossover study. Setting: SC combined with different shoulder position (diagonal/straight) and different pinch force strength (weak/strong) and different movement direction (extension/flexion) after SC. Participants: Twenty patients with orthopedic impairments without neurological deficit (6 male and 14 female) with restricted wrist joints. Main Outcome Measures: MAROM change ratio measured using an electromyograph (MAROM change ratio of wrist flexion/extension after static contraction was calculated by subtracting the MAROM before the static contraction, wrist agonists and antagonists, IEMG amplitude ratio (the associated IEMG activities after each static contraction during 1-second were normalized expressed as IEMG ratio.) Results: Three factor ANOVA for MAROM change ratio showed no significant main effects for movement direction (f(175)=0.036 p =0.851) and pinch force strengths (f(175)=1.189 p=0.173). There was no interaction between pinch force strength and shoulder position (f(175)=0.811 p=0.371)). Shoulder position showed only significant main effect (f(175)=5.344 p=0.024) for MAROM change ratio. Conclusions: While the hypothesis that facilitation/inhibition of the agonist/antagonist for improving MAROM of the wrist joint by SC was denied, Diagonal position showed significant effect compared with straight position after SC. If direct approaches to improve MAROM are difficult because of pain or weakness of the agonist muscles and/or antagonist muscles, indirect neurorehabilitation therapy such as the use of specific SC to obtain the benefits of aftereffect may be useful for improving restricted joints.

No. 340 Haglund’s Syndrome: A Case Report.
Ayca Uran; Volkan Yilmaz, MD (Guilhane Military Medical Academy Department of Physical Medicine and Rehabilitation AnkaraTurkey); Koray Aydemir; Mehmet Ali Taskaynatan.

Disclosure: None. Setting: Tertiary care university hospital. Patient: A 16-year-old male with Haglund’s syndrome (HS) Case Description: A 16-year-old patient was admitted to our department with pain of the left heel. His complaints had started two years ago after a strenuous exercise. On physical examination, left ankle joint range of motion was minimally limited, the hindfoot was tender, and gait was analagic. Assessments: Acute phase reactants were increased. Rheumatoid factor was negative. X-ray imaging revealed a protrubance on the posterosuperior calcaneal region. Magnetic resonance imaging (MRI) revealed bone marrow edema and signal changes in the posterosuperior calcaneus and adjacent soft tissues, which were compatible with HS. Diclofenac 75 mg/day is started as medical treatment and isometric strengthening and range of motion exercises are prescribed. His symptoms regressed after these treatments. Discussion: HS is a rare clinical condition of heel pain consisting of soft tissue inflammation and expansion of the retrocalcaneal bone. The diagnosis is often confusing as the clinical picture may mimic other hindfoot pain pathologies. Therefore the diagnosis should be confirmed by radiological assessments like radiography ultrasonography or MRI. Conclusion: HS is a clinical condition that should be kept in mind for patients who suffer from heel pain. Reprinted with permission.

No. 341 Medial Tibial Stress Syndrome: A Case Report.
Luís Boaventura; Duarte Rufino.

Patient: A 27-year-old male. No previous medical history or regular medication. Competitive mountain biker on regional championships. Case Description: Visit to the sports medicine specialist with complaints of bilateral pain along medial portions of the tibia most frequently found after several hour training sessions and lasting for weeks. During acute periods pain would be felt even during walking or stair climbing. Assessment: Results: On physical examination patient had good thigh and legs muscle mass, normal leg and knee alignment, and a normal foot arch. On palpation there was bilateral tenderness of the middle tibial regions, particularly on the upper half. X-ray showed tibial cortical thickening but no signs of periosteal changes. MRI confirmed periosseous edema on both medial tibial borders. Pharmacological treatment for pain control, a comprehensive physical therapy program, and bicycle adjustments (including saddle height and angle and clipless pedal position) allowed for clinical improvement. Discussion: Medial tibial stress syndrome (MTSS) or “shin splints” is a frequent injury of the lower extremity and one of the most common causes of exertional leg pain in athletes. It may be disabling and progress to more serious complications if not treated properly. Etiology is multi-factorial and involves training errors and various biomechanical abnormalities. Diagnosis is essentially clinical: imaging is usually not necessary. Conservative treatment yields satisfactory results. Surgical treatment is rarely proposed. Conclusions: There is limited evidence to support different interventions for MTSS. Rest, ice, and analgesics are consensual in the acute phase. Modification of training routine programs, stretching and strengthening the lower extremity, specific footwear or orthotics are recommended. Other interventions like shock wave therapy or acupuncture need further assessment. Prevention is essential.
No. 342 Extremely High Weight Lifting: Injuries and Outcomes in a Middle Age Population.
David T. Burke, MD; Daniel P. Burke; Regina B. Bell; Ariel Alexandroni.

Objective: To determine the risk of injury and the likely benefits from weightlifting using the gravitational wellness method. Design: A retrospective review of consecutive patients seen at a gravitational wellness facility. Setting: A wellness center in a community setting. Participants: Participants were consecutive patients seen over a one-year period in a wellness center. Interventions: The intervention was a weightlifting program involving high weights lifted in four stations during a 30 minute session repeated weekly. Outcomes: The weights lifted at each station were retrieved from the patient chart. Follow-up questionnaires were administered by phone to determine injuries incurred during participation as well as specific and general health benefits as measured on a five-point Likert scale. Level of Evidence: Level I. Results: Participants ranged in age from 18 years to 69 years with a mean age of 48.6 years. The mean final weight lifted was 1114.85 pounds (505.69 kg) for the belt lift, 390.13 pounds (181.04 kg) for the hand lift, 306.029 pounds (138.81 kg) for the chest lift, and 860.83 pounds (390.46 kg) for the leg press. Of the participants, 42 (59%) presented to the gym with the objective of improving overall subjective health. The subjects realized improvement on a five point Likert scale of 4.2/5 in their presenting complaint and improved by 4.275 in their overall subjective health. Discussion: These results indicate that using extremely high weights lifted 30 minutes per week can result in dramatic improvements in weights lifted with improvement in musculoskeletal well-being and overall subjective health. Conclusion: This study adds to the literature demonstrating that weightlifting with gravitational wellness system can allow for high weights to be lifted with no significant risk of injury.

No. 344 Rehabilitation Treatment in a Case of Advanced Tumor Induced Osteomalacia: A Case Report.
Delia P. Ceballos-Saenz; Sophia B. Gutierrez-Casillas; Hugo A. Avila-Ramos; Paola E. Ruiz-Padilla.

Setting: Tertiary care center. Patient: A 41-year-old female with tumor-induced osteomalacia (TIO). Case description: The patient started her illness at age 27 with a right hip fracture, muscular weakness, pain, and anthropometric changes. During the evolution of her disease she presented 3 more bilateral hip fractures and low impact mechanism fractures in all 4 extremities. At 40, endocrinology diagnosed TIO secondary to a phosphataemic mesenchymal tumor (PMT) in the right heel. After surgical excision of the tumor she was referred to rehabilitation with multiple joint contractures, bone deformities, postural changes, incapacity to walk nor stand, pain, severe motion range limitation, and muscle weakness, restricted lung capacity and disability in most activities of daily living (Barthel score 35). Assessment: We started rehabilitation treatment with the aim of optimizing functional mobility, improving aerobic capacity, and strengthening to promote bone mineralization. All based on physical therapy with hydrotherapy, therapeutic ultrasound, mobilizations, aerobic and resistance exercise, pulmonary manual and occupational therapy. Nowadays she is showing significant improvement since the diagnosis achieving independence in activities of daily living (Barthel 75). Discussion: TIO is a paraneoplastic syndrome (337 reported cases) caused by abnormal renal phosphate wasting. It is due to an increased expression of parathyroid hormone-related protein (PTHrP). The paraneoplastic syndrome consists of relative rest, physical therapy, and pain control. Conclusions: TIO is a rare disease and we did not find any reports in the literature with this severity or rehabilitation treatment. In this case our management has been essential because it has achieved independence of the patient and also a great improvement in her life quality.

No. 345 Spontaneous Iliopsoas Tendon Rupture in an Elderly Female: A Case Report.
Joseph David; Manish Mammen; Jack Mensch; Paul Pipia.

Setting: Acute rehabilitation unit at a tertiary care hospital. Patient: A 74-year-old female with past medical history of end-stage renal disease on hemodialysis, coronary artery disease status post coronary artery bypass graft, hypertension, and atrial fibrillation. Case description: The patient was admitted with swelling, redness, and pain in the right knee following recent total knee replacement. She underwent knee debridement had a vacuum dressing placed and was treated with intravenous antibiotics including cefazolin and vancomycin. While on the acute inpatient rehabilitation unit the patient complained of pain and weakness in the proximal left lower extremity and groin. Computed tomography (CT) scan of the left lower extremity did not reveal any fracture hematoma or fluid collection. Magnetic resonance imaging (MRI) of the left lower extremity revealed a full thickness tear of the distal iliosposas tendon. She was managed conservatively and restarted on physical therapy. Results: The patient made progress in acute rehabilitation. She was discharged home ambulating approximately one hundred feet with modified independence using rolling walker. Discussion: Iliopsoas tendon ruptures are rare. They more commonly occur following trauma and in elderly females. Tendon injuries are also frequently seen in patients with metabolic diseases and in patients with renal disease on hemodialysis. Iliopsoas tendon ruptures can present with groin pain and patients may have difficulty with ambulation. Treatment consists of relative rest, physical therapy, and pain control. Conclusions: Iliopsoas tendon ruptures should be included in the differential diagnosis of anterior groin pain in elderly females. MRI is used to make the diagnosis. Treatment is generally conservative with favorable outcomes.

No. 346 Effects of Focal Muscle Vibration on Physical Functioning in Patients With Knee Osteoarthritis.
Alessandro De Sire; Francesca Gimigliano; Alessia Rabini; Diana Barbara Piazzini.

Objective: The aim of the present pilot study was to evaluate the effects of focal muscle vibration on physical functioning in patients with symptomatic knee OA. Setting: Outpatients clinic university hospital. Population: Men and women aged 60 years or older with radiographic diagnosis of mild to moderate monolateral knee OA (Kellgren-Lawrence grade II or III) and chronic knee pain. Patients were randomized in two groups (treatment group and placebo control group). The treatment group received focal muscle vibration treatment according to the “repeated muscle vibration” protocol. The control group received a sham treatment. Main Outcome Measures: The primary outcome measure was the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Secondary outcome measures were the short physical performance battery (SPPB) and the performance-oriented mobility assessment (POMA). Follow up evaluations were done at 3 and 6 months. Results: Fifty patients were recruited and randomly assigned to either the study or control group. There was a statistical significant difference between the two groups both for primary and secondary outcomes. Conclusions: In this pilot study focal muscle vibration therapy has proven to be effective and safe in improving functioning of patients affected by mild to moderate chronic knee OA.

No. 346 Shockwave Therapy in Delayed Union in the Treatment of Forefoot Fractures: A Case Report.
Carmen Teresa Esquivia Pajarero; Catalina Urrego Chinome.

Disclosure: None. Setting: Central military hospital. Patient: A 24-year-old man with a forefoot fracture. Case description: Patient with a forefoot fracture after stepping on an anti-personnel mine. Left foot radiographs show nondisplaced second metatarsal fracture, comminuted first metatarsal and proximal phalanx of the hallux fracture, transverse fourth and third metatarsal fracture being managed with debridement and
internal fixation. 4 months later metatarsophalangeal arthrodesis is performed for management of hallux flexion deformity. Also no binding was found in 3rd metatarsal fracture and reduced plate was fixed. It was decided not to apply internal fixation of fractures of the second and fourth metatarsals as they are aligned in the anterior-posterior and lateral plane. Five months later is assessed by orthopedics where the patient indicates pain. Radiographs confirm delayed union of the fracture of the second metatarsal and hallux is referred to physiatry for service management. A total of 6 sessions of shock wave therapy on hallux and second metatarsal each session apply 3000 LPM to 14 Hz and a 2 bar intensity with 1-month intervals initially and then every week are made. Assessment/Results: At 4 months post-shock wave therapy the patient is assessed by orthopedics again; four months later new x-ray evidence of healing of hallux and the second metatarsal and clinically without pain at the foot. Discussion: This is the first reported case to our knowledge of shock wave therapy in the treatment of delayed union in foot. Conclusion: The shock wave therapy seems to be an option for the management of non-unions however more studies should be conducted to assess the effectiveness and risks of these treatments.

No. 349 Effectiveness of Individualized Physiotherapy Program of Exercise on Functional Capacity in Community-Dwelling Elders.
Abigail Flores Díaz; M. María Cristina Enríquez-Reyna; Rosa María Cruz Castruitla; Hugo Aguilre Zuazua.
Objective: To evaluate the effectiveness of individualized physiotherapy program of exercise with therapeutic microwave diathermy (MD) and functional electrical stimulation therapy (FES) on functional capacity in elderly people of the community. Design: Prospective intervention study with a before and after design. Setting: Community elders from a senior center in a community at Torreon Coahuila Mexico. Participants: A total of 26 elder people of the community with functional pain were included in this study. Participants were separated into 2 groups (n=13). Interventions: Individualized physiotherapy program included thermotherapy, MD and/or FES by 25 minutes and after that 30 minutes of assisted and functional therapeutic exercise. Experimental group took part of an individualized physiotherapy program with therapeutic MD or FES and functional exercise. An hour session was lead by physiotherapists two times weekly for five weeks. Control group received standard care by the senior center. The program ongoing with functional passive and assisted active movements-taking account individual joint restrictions-towards progressively increase of the range of motion and flexibility; and finally relaxation exercises for 5 minutes. Therapeutic MD was with a stimulation frequency of 1 MHz (80 watts/10 minutes) and FES was used when it was determined that the patient needed assistance. Main Outcome Measures: Movement range with goniometry, manual muscle test, and Tinetti performance oriented mobility assessment. Level of Evidence: Level 2 research results. Assessment/Results: There was statistically significant improvements in shoulder range of movement (from 116° to 146° t = -3.083 p = .004), level of pain, and functional capacity when compared with their initial status (p < 0.05). There were no statistically differences in control group. Conclusions: The exercise program with therapeutic MD and FES may be preferable for a better functional capacity than exercise alone.

No. 350 Sindrome de Pellegrini Stieda: Reporte De Un Caso.
Gil Chang Victor; Valerio Gil Lillem; Gil Chinchilla; Laura.
Disclosure: None. Patient: A 55-year-old woman. Case Description: After a distorting trauma on the right knee eight weeks ago when she was walking on a irregular sidewalk. She was initially managed by the orthopedic surgeon. The x-rays of the right was normal. He treated her with a cast with knee extension by 3 weeks, however the patient did not improve. Then a CT scan revealed a calcification on the soft tissue adjacent to the medial femoral condyle. She was referred to the rehabilitation department because of medial pain and limitation of range of motion of her knee. Assessment/Results: After six weeks she continues having right knee pain especially at the medial side of the right knee and motion between 0-80. Then she was injected with trimcinolone acetate 25 mg and lidocaine 1% adjacent to the medial femoral condyle. She initiated a physiotherapy program consisting of ultrasound, electrical nerve stimulation, improvement of range of motion and strengthening of quadriceps and hamstring muscles. Discussion: Pellegrini stieda syndrome (PS) is the presence of calcification of soft tissue adjacent to the medial condyle secondary to trauma associated with knee and decreased range of motion of this joint. Pellegrini stieda syndrome although rare should be considered. The response to physiatric treatment was excellent controlling pain and improving the range of motion. Conclusion: The physiatric management was excellent in the recovery of this rare syndrome.

No. 351 Influence of Sarcopenic Obesity on Osteoporosis and Vertebral Fragility Fractures in Post-Menopausal Women.
Francesca Gimigliano; Alessandro De Sire; Antimo Moretti; Giovanni Iolascon.
Objective: The aim of our retrospective case-control study is to evaluate the influence of sarcopenic obesity on osteoporosis and vertebral fragility fractures in post-menopausal women. Setting: Our patients clinic university hospital. Participants: Participants were recruited among post-menopausal women aged 50 years or older with a BMI > 30 kg/m² from January 2011 through December 2013. According to Newman et al, definition based on appendicular lean mass adjusted for height and body fat mass (residuals) these patients were classified in two groups: sarcopenic obese and non sarcopenic obese. Main Outcome Measures: We evaluated bone mineral density at lumbar spine, femoral neck, and total body DXA scans. Vertebral fragility fractures were identified using the technique of lateral vertebral assessment (LVA) of DXA scan. Results: We evaluated 133 women mean aged 63.71 years ± 8.59 (min. 50 years, max. 84 years) with a mean BMI of 34.31 ± 3.96 kg/m² (min. 30.04; max. 33.97). Forty-seven patients (35.33%) of our population had sarcopenic obesity 19 of these patients (40.43%) were osteoporotic and 15 (31.91%) had a vertebral fracture: 8 (17.02%) with a single vertebral fracture and 7 (14.89%) with multiple vertebral fractures. Sarcopenic obesity was associated with a higher risk of osteoporosis (odds ratio or 1.20; 95% confidence interval CI 0.25-0.58) and a higher risk of vertebral fractures (OR 1.21; 95% CI 0.56-2.62). Conclusions: In our cohort of post-menopausal women, sarcopenic obesity was associated with a higher risk of osteoporosis and vertebral fragility fractures.

No. 353 Effectiveness of Rehabilitation for Elderly Patients With Bilateral Femoral Neck Fractures.
Masashi Haga; Hideki Yumikake; Shiro Hanakawa; Naoya Kobayashi.
Objective: With increasing average life expectancy the incidence of femoral neck fractures (FNFs) is tending to increase among elderly people in Japan. We may encounter cases of contralateral FNF occurring after unilateral FNF. However there are few reports to date on bilateral FNFS. Here we reviewed cases of bilateral FNFS and report their findings and characteristics. Setting: A rehabilitation center of the 119-bed general hospital in Japan between 2011 and 2013. Participants: Five patients with bilateral FNFS during the study period. Interventions: According to our clinical path early amublation and gut training with an applied load were initiated from the day following surgery. Patients also received the tailored multifaceted interventions including trainings for joint range of motion, muscle strength maintenance and systemic adjustment. Main Outcome Measures: We reviewed medical records to identify age at fracture onset, hospitalization period, changes in walking level (independent or assisted walking/ nonambulatory), and residence after discharge.
No. 355 Effects of Two Cold Modalities on the Excitability of the H Reflex and Skin Temperature.

Esperanza Herrera Villabona; Maria Cristina Sandoval Ortiz.

Objective: To compare the effects of two cold modalities on the H-reflex excitability and skin temperature in healthy young subjects.

Design: Experimental study. The participants were randomly assigned to either one of two groups: cold water immersion (CWI) or ice pack (IP).


Methods: CWI and IP were applied on the dominant leg for 20 min. The H reflex was evoked by stimulating of the posterior tibial nerve at the popliteal fossa level and recording on thesoleus muscle. Measurements were obtained before and after cooling. Independent variables: cold modality and measurement time. Dependent variables: skin temperature, latency, duration and amplitude of the M and H waves. The data were analyzed by paired t-test (comparison of measurements in each group) and unpaired t-test (comparison of effects of each cold modality).

The level of significance was set at p ≤ 0.05. Results: The groups were homogeneous on their demographic characteristics. The skin temperature decreased significantly being greater cooling caused by the IP (∆25–5°C). The latency amplitude and duration of the M and H waves significantly increased in both groups (p ≤ 0.01). Compared to CWI, IP produced greater changes in the latency and duration of the M and H waves (p < 0.05). These results indicate that although the H reflex conduction is slower after cooling, the response is longer and the pattern of motoneurons recruitment is higher. The physiological effects of cooling on reflex excitability determined in this study have clinical relevance for the cryotherapy intervention on spasticity and sports injuries. Level of Evidence: Level 1.

No. 356 Effects of the Three Cold Modalities on Nerve Conduction.

Esperanza Herrera Villabona; Maria Cristina Sandoval Ortiz.

Purpose: To study the effects of ice pack (IP), cold water immersion (CWI), and ice massage (IM) on the conduction parameters of the sural and tibial motor nerves. Design: Experimental study. The subjects were randomly assigned to one of three groups: IP, CWI and IM. Setting: Electrodiagnosis laboratory of a public university. Participants: Thirty-six healthy individuals (18 women and 18 men) voluntarily participated in this study. Mean age and BMI were 20.5 (1.9) years. Independent variables: cold modality and pre and post-cooling measurement time. Dependent variables were skin temperature and nerve conduction parameters. Subjects: Thirty-six healthy subjects mean age 20.5 (1.9) years. Interventions: IP, CWI and IM were applied to the right calf region for 15 min. Measurements: skin temperature and nerve conduction parameters were recorded before and immediately after cooling.

Results: All three modalities reduced skin temperature (mean 18.2°C, p ≤ 0.001). Also amplitude decreased and latency and duration of the compound action potential increased (p ≤ 0.05). Ice massage, ice pack and cold water immersion reduced the sensory nerve conduction velocity (NCV) by 20.4, 16.7 and 22.6 m/s, respectively. Conclusions: Three modalities were effective in reducing skin temperature and changing sensory conduction at a physiological level. It might be sufficient to induce a hypalgesic effect. Sensory nerve fibers are more affected by the cold modalities than motor fibers. Level of Evidence: Level I.

No. 357 Shuttlecock Kicking Protects Post-Menopause Women From Osteoporosis And Fall.

Li-Ping Huang; Chen-Ming Huang; Long-Jun Cao; Qiang Tian.

Objective: To test the hypothesis that in post-menopause women long-term shuttlecock kicking (SCK) exercise has a positive and better-effect on protecting them from osteoporosis and fall than long-term walking (WAL) exercise. Design: Cross-sectional study. Methods: 60 participants met the enrollment criteria collected according to the questionnaire screening: 30 post-menopause women with long-term SCK exercise, 30 long-term walking women with long-term walking exercise. Bone mineral density (BMD) with dual energy x-ray scan and balances with 30 second close-eye single leg stance and 30 second close-eye walking on site in leg lifts were measured. 13.0 edition SPSS statistical software was used for analyses the data. P = 0.05 was set as a statistically significant level. Results: The BMD of the hip, lumbar vertebrae and whole body of the women in SCK group were higher than those in WAL group (0.705 ± 0.089 vs. 0.639 ± 0.119, 0.97 ± 0.115 vs. 0.91 ± 0.104, 1.05 ± 0.081 vs 1.00 ± 0.084 g/cm², respectively). No difference was found in the static balance tests between two groups. The participants in SCK group have better dynamic balance than those in WAL group (19.47 ± 11.806 vs 13.79 ± 5.904 sec.). Conclusion: SCK protects post-menopause women from osteoporosis and fall even better than walking exercise.

No. 358 Circulatory Physiological Change in Scuba Diving - Preliminary Report: Analysis of an Aged Hemiplegic Diver.

Takashi Isaji; Chiho Sasaki; Masayoshi Yamamoto; Yuji Honda.

Disclosure: None. Objective: To obtain the basic data about changes of the circulatory physiological index of a disabled person on scuba diving (SD). Design: Preliminary cross-sectional study. Setting: Real recrea-tional SD and daily living around SD participant: a 68-year-old hemiplegic female diver suffered from cerebral infarction eight years previously who has had hypertension, diabetes mellitus and dyslipidemia. Interventions: After the portable Holter recorder was put on the body electrocardiogram (ECG), blood pressure (BP) and oxygen saturation (SPO_{2}) were recorded for approximately 24 hours containing normal daily activities including nap (70). Two beats of ventricular paroxysmal contractions were seen only in sleeping; eighteen beats of supra-ventricular paroxysmal contractions were seen equally throughout measurement time. Maximum systolic BP (225 mmHg) was recorded during 1st SD and minimal (126) while sleeping. Average systolic BP during SD (204) was significantly higher than those recorded in daytime (164) and sleeping (141). Average SPO_{2} during SD (98%) was significantly higher than daytime (96) and sleeping (95). Conclusions: There were no specific changes for the aged disabled with hemiplegia during SD but both HR, BP and SPO_{2} increased as the usual physiological variance. Reprinted with permission.

Ummais Khani; Gautam Malhotra, MD (Dept of PM&R Rutgers NJMS, Newark, NJ).

Disclosure: None. Setting: Outpatient PM&R. Case Description: An 87-year-old man with history of chronic lymphocytic leukemia (CLL) presented with severe right wrist pain which began after reportedly “lifting a heavy book”. He came in with a thumb spica splint for presumed de Quervain’s Tenosynovitis. Examination revealed moderate swelling of the palm without any erythema or induration. Tenderness was noted at the radial aspect of the wrist, first carpometacarpal joint as well as the first second and third digiti flexor tendons. Wrist extension and grip strength were significantly pain limited. He was asked to return to clinic after obtaining wrist/hand x-rays. Two days later pain and swelling were noted to be worse. X-ray revealed multifocal moderate degenerative changes but no fracture dislocation or other pathology. Given the concern for palmar infection the patient was sent to the emergency room for immediate workup. MRI without contrast showed diffuse non-specific cellulitis, myositis, and perifascitis. Laboratory data revealed elevated uric acid, normal erythrocyte sedimentation rate, normal creatine phosphokinase, and elevated WBC (consistent with his baseline in the context of CLL). He received dexamethasone for likely gouty arthritis with plan to finish short course of steroids and then start allopurinol for prevention. Chart review revealed he was started on hydroxyurea for CLL ten years ago with relatively stable normal uric acid levels over that time. Results: On follow up phone call two days later the patient reported to his primary care physician that pain and swelling had subsided significantly. Discussion: Initial presentation of gout may vary greatly and can include such unusual cases as wrist pain. Allopurinol is recommended to treat secondary gout in this setting as opposed to uricosuric agents. Conclusion: Physicians should be aware of secondary gout caused by medications such as hydroxyurea especially in the setting of atypical initial presentation.

No. 361 Characterization of Tendon Derived Stem Cells According to Diverse Tendon Status.

Sang Jun Kim, Phil Talman, PhD; Deok Ho Kim; Sun Jeong Kim.

Disclosure: None. Objective: To investigate the characterization of tendon derived stem cells (TDSC) according to aged and tendinopathy status. Design: Experimental in-vitro study. Setting: Stem cell laboratory at biomedical research institute. Participants: The tendon related cells were primarily cultured from the normal tendon tissues of 5-week-old Sprague-Dawley (SD) rats (n=2), 15-week-old SD rats (n=2), and a 38-week-old SD rat (n=1) and from the tendon tissues of chemically (n=2) and surgically (n=2) induced tendinopathy. TDSCS were isolated through the single cell culture method and identified by the stem cell markers (Oct-4 SSEA and nucleostemin) and multipotencies (tenogenic, adipogenic, osteogenic, and chondrogenic). They were cultured on the nano-topographic matrices until reaching confluence of 80%. If TDSCS did not reach the confluence beta-galactosidase staining was done to check the senescence. Main Outcome Measures: Doubling time was calculated for the proliferative capacity in each condition. Major components of tendon (collagen type I, collagen type III, and decorin) were expressed for the reparative capacity by the immunofluorescent staining and quantified by QRT-PCRD and Western blots. Level of Evidence: Level 1. Results: TDSCS from 15-week-old normal rats and a 38-week-old normal rat were not proliferated and under the senescent process. TDSCS in 3-week-old normal rats showed better proliferative and reparative capacities than TDSCS in 5-week-old rats with chemically induced tendinopathy. On the contrary TDSCS in 15-week-old rats with surgically induced tendinopathy showed better proliferative and reparative capacities than TDSCS in 15-week-old normal rats. Conclusions: Tendon derived stem cells lost their proliferative and reparative capacities with the aging process and by the chemical toxicity. However these capacities were restored by the surgical stimulation which might be the reactive process after the injury.

No. 362 Ruptured Popliteal Cyst Diagnosed by Ultrasound Before Evaluating DVT.

Joon-Sung Kim, MD, PhD; Seong Hoon Lim, MD, PhD; Bo Young Hong, MD, PhD. Department of Rehabilitation Medicine St. Vincent’s Hospital; College of Medicine the Catholic University of Korea Republic of Korea.

Disclosure: None. Setting: University hospital. Patient: A 58-year-old male patient with painful swelling of the leg. Case Description: A 58-year-old male patient had developed a chicken egg sized painful lump in the left popliteal fossa 2 months ago. He had no obvious trauma history and had been diagnosed with osteoarthritis in his knee joints about 5 years before. He had intermittent knee pain but after trekking a mountain the pain and swelling extended to his lower leg. His VAS was 5 and tenderness present at popliteal fossa and calf. Wound was aggravated when he was dorsi-flexed. His left leg is 1 cm larger in circumference than his right. There were no palpable mass or skin lesions. Flexion of left knee is restricted at 90 degrees. Assessment/Results: “Weight bearing” PA plain radiography showed KL grade 1 alterations bilaterally. Ultrasonography revealed a large hypo-echoic space behind the calf muscles. Some joint effusion and synovial hypertrophy were seen. Ultrasound guided aspiration was performed and 10ml of blood tinged mucinous fluid was aspirated. We performed the intra-lesional injection of corticosteroid (triamcinolone acetone 20 mg). A few weeks later he still complained of calf pain and a follow up ultrasound revealed fluid collection in his proximal calf. After re-aspiration of fluid under ultrasound guidance the pain was relieved. Conclusion: When the popliteal cysts are ruptured it can cause severe pain and leg swelling and this symptom mimics deep vein thrombosis. If we use ultrasound, we can diagnosis it easily and treat effectively.

No. 364 Prognostic Factors Predicting the Early Functional Recovery of Prefracture Functional Mobility.

Dae Gu Lee; Sang Jun Kim.

Objective: To investigate the prognostic factors to predict the recovery of prefractional functional mobility in short-term follow up. Design: Retrospective chart review study. Setting: Tertiary University Hospital in South Korea. Participants: Five hundred ninety patients with hip fracture operation from January 2006 to June 2013 at a tertiary university hospital were selected in this retrospective study. Clinical characteristics and predicted factors affecting functional recovery such as preexisting diseases, the presence of cognitive dysfunction and depression, operation method, prefracture mobility, the delay in surgical repair (day), and the delay in rehabilitation (day) were reviewed. Interventions: Not applicable. Main Outcome Measures: The use of ambulatory assistive device was used to assess functional mobility level. Functional status of gait was classified into bedridden state (BR), wheel chair bound state (WC), walker gait (WG), single cane gait (CG), and self-gait without any ambulatory assistance device (SG). When this functional grade in a patient was recovery after the surgery compared to that before the surgery this was considered “functional recovery”. Level of Evidence: Level 1. Results: Two hundred ten patients (35.6%) showed recovery of preoperative mobility in one month after operation. Multiple logistic regression analysis identified the following four factors to be significantly associated with recovery of the preoperative functional mobility: age 80 or above 80 (odds ratio (OR) 0.34 (95% CI 0.36-0.80)), delay in rehabilitation after operation (>3 days)
No. 365 Further Evidence of the Hemorheological Safety of Pulsed Electromagnetic Fields in Post-Menopausal Women With Osteoporosis by Randomized Placebo Controlled Clinical Trial.
Huilang Liu; Hongchen He; Lin Yang; Ying Liu.

Objective: There are diverse options for treating postmenopausal osteoporosis (PMO). Pulsed electromagnetic fields (PEMFs), one of the non-drug treatments, are more and more popular nowadays especially among patients who are intolerant to medications. So research focusing on its safety is in great need. This randomized placebo controlled clinical trial investigated the hemorheological safety of PEMFs in treating PMO. Methods: A total of ninety-five postmenopausal women with osteoporosis were included and randomly assigned to two groups. Fifty of them received PEMFs and the remaining forty-five received sham treatment. At baseline and after treatment venous blood samples were collected to measure 14 hemorheological determinants. We applied independent samples t-test, paired samples t-test, and chi-squared tests respectively to perform the statistical analysis. Moreover, relationships between variables were determined by Pearson correlation analysis and multiple linear stepwise regression analysis was used to explore predictors of selected determinants. Results: We found no significant difference between the placebo and PEMFs groups for any of the 14 hemorheological determinants (p > 0.05) or the percentage of patients whose hemorheological determinant were within reference range (p > 0.05). On the other hand, hematocrit was detected to be significantly correlated with body mass index (p = 0.003) and the most significant predictor of blood reduced viscosity at low shear rate was blood viscosity at low shear rate. Blood reduced viscosity at high shear rate was the most important predictor of plasma viscosity. Conclusions: Regarding hemorheological safety PEMFs may not induce adverse effects in patients with PMO.

No. 368 Effectiveness of Using a Single Dose of High Molecular Weight Hyaluronic Acid for the Relief of Pain and Improvement of Gait Performance in Patients With Knee Osteoarthritis.
Meza C. Delky1; Finis G. Paola1; Dr. Arnulfio Arias Madrid2 (1Physical Medicine and Rehabilitation Resident, Complejo Hospitalario); (2Caja De Seguro Social. Republic of Panama).

Objective: To evaluate if the single dose of high molecular weight hyaluronic acid (HMW-HA) is effective for the relief of pain and improvement of gait performance (GP) in patients with knee osteoarthritis (OA). Study Design: Experimental prospective longitudinal. Setting: Physical medicine and rehabilitation and orthopedic outpatient departments. Participants: 43 patients with knee OA (knees infiltrated= 55) with complete evaluation forms who did not required any assistive device or used only because of knee OA. Interventions: A single intraarticular knee infiltration of 6ml (3 syringes of 2ml each) of HMW-HA was performed with strict aseptic technique. The patients were reevaluated at the first and fourth week after intervention. Main Outcome Measures: Pain: numeric verbal scale of pain WOMAC subscale A for rest, walking, climbing stairs and night pain. GP: subjective scores for walking difficulties, need of pain medication need of assistive device (from 1 for “never” and 3 for “always”). Level of Evidence: Level 3. Results: According to the numeric verbal scale of pain it decreased from 6.02 to 3.76 (p=0.0001) points at the first week and to 3.44 (p=0.0001) the fourth week. WOMAC subscale A showed significant decrease of all the pain measurements after the intervention (p<0.05). The difficulty walking changed significantly from 1.53 to 0.95 (p=0.0001) and 0.78 (p=0.0001). The need of assistive device did not show a significant decrease. Conclusion: The single application of HMW-HA is effective to relief knee pain and to improve gait performance related to walking difficulty and need of pain medication while it is not in the need of assistive device.

No. 369 Extracorporeal Shock Wave Therapy in Lateral Epicondylitis.
José Antonio Mirallas Martínez; María Teresa Sabate Querol; María Consuelo Tudela Salom; María Teresa Ricarte Benedillo.

Objective: To study the effectiveness tolerance and satisfaction of extracorporeal shock wave therapy (ECSWT) in lateral epicondylitis. Design: Prospective descriptive study. Setting: Implementation of treatment with ECSWT in lateral epicondylitis. Participants: 93 consecutive adult subjects with calcific tendinosis of shoulder. Interventions: All were treated by ECSWT 1 session per week for 4 weeks. All were assessed before each treatment and one month after completion of therapy. The frequency analysis was conducted. The level of evidence is 3. Main Outcome Measures: Pain tolerance and satisfaction through visual analog scale 0-10 (VAS), energy used, number of shots limitations (in daily living activity, sporting activity or working activity) and articulation range measurement of the elbow. Results: The mean flux density applied was 023±0.009 mJ/mm² and the mean number of pulses applied 11699±3146. Within two months of the implementation of the first ECSWT session the evaluation resulted in significant improvement in pain (77.8% less in activity) and in articulation range measurement (81%±51%) more in flexion-extension of the elbow. The limitations in daily living activity sporting or working activity that initially existed in 93 (100%) persisted at two months in 2(22%) and 2(22%), respectively. The tolerance was good without important pain in 72(77%) and without secondary effects of interest. Mean flux density applied, number of pulses applied, and improvement in pain compared with other studies are respectively: 0.23 mJ/mm² / 0.27 mJ/mm²; 11699±3146 and 72% / 48%-92%. Conclusions: ECSWT in lateral epicondylitis is well tolerated and shows a significant effectiveness for pain and relief functional restoration with a mean satisfaction of 82±22 (VAS 0-10).

No. 370 Extracorporeal Shock Wave Therapy in Plantar Fasciitis.
José Antonio Mirallas Martínez; Laura Peña Pachés; Jorge Andrés Vásquez Castro; Maysa Hayani Al-Nisr.

Objective: To study the effectiveness tolerance and satisfaction of extracorporeal shock wave therapy (ECSWT) in plantar fasciitis. Design: Prospective descriptive study. Setting: Implementation of treatment with ECSWT in plantar fasciitis. Participants: 174 consecutive adult subjects with plantar fascitis. Interventions: All were treated by ECSWT 1 session per week for 4 weeks. All were assessed before each treatment and one month after completion of therapy. The frequency analysis was conducted. The level of evidence is 3. Main Outcome Measures: Pain and satisfaction through visual analog scale 0-10 (VAS), tolerance energy used, number of shots, limitations (in daily living activity, sporting activity or working activity) and articulation range measurement of the ankle. Results: The mean flux density applied was 035±0.011 mJ/mm² and the mean number of pulses applied 14682±5067. Within two months of the implementation of the first ECSWT session the evaluation resulted in significant improvement in pain (77.8% less in walking) and in articulation range measurement in the flexion-extension of the ankle (54%±75% more). The limitations in daily living activity, sporting or working...
activity that initially existed in 174(100%) persisted at two months in 116(61%) and 140(8%), respectively. The fascitis that existed in 31(17.8%) and calcification in 7(4%) disappeared. The spur that existed in 76(47.3%) persisted. The tolerance was good without important pain in 134(77%) and without secondary effects of interest. Mean flux density applied, number of pulses applied and improvement in pain compared with other studies are respectively: 0.03 mJ/mm² 0.045 mJ/mm² 1.468/2000 and 78.5%/2 1%-84%.

Conclusions: ECSWT in plantar fascitis are well tolerated and shows a significant effectiveness for pain relief and functional restoration with a mean satisfaction of 81±2(VAS 0-10).

No. 371 Extracorporeal Shock Wave Therapy in Calcific Tendinosis of Shoulder. 
José Antonio Mirallas Martínez; María Teresa Ricarte Benedito; Adelia Beltrán Vives; María Teresa Sabater Querol.

Objective: To study the effectiveness, tolerance and satisfaction of extracorporeal shock wave therapy (ECSWT) in calcific tendinosis of shoulder. Design: Prospective descriptive study. Setting: Tertiary care rehabilitation hospital. Participants: 178 consecutive adults subjects with calcific tendinosis of shoulder. Interventions: All were treated by ECSWT 1 session per week for 4 weeks. All were assessed before each treatment and one month after completion of therapy. The frequency analysis was conducted. The level of evidence is 3. Main Outcome Measures: Pain tolerance and satisfaction through visual analog scale 0-10 (VAS), energy used, number of shots, limitations (in daily living activity, sporting activity or working activity), calcifications, lithotrips and articular range measurement of the shoulder. Results: The mean flux density applied was 0.99±0.19 mJ/mm² and the mean number of pulses applied 2210±78. Within two months of the implementation of the first ECSWT session the evaluation resulted in significant improvement in pain (65.1% less in activity) and in articular range measurement (292±16.2% more in active abduction of the shoulder). The limitations in daily living activity, sporting or working activity that initially existed in 178(100%) persisted at two months in 20(11.2%) and 28(15.7%), respectively. The calcifications that existed in 178(100%) persisted in 82(46%). The tolerance was good without important pain in 129(72.5%) and without secondary effects of interest. Mean flux density applied, number of pulses applied and improvement in pain compared with other studies are respectively: 0.09 mJ/mm² 0.060 mJ/mm² 2.210/2000 and 651%/21%-84%. Conclusions: ECSWT in calcific tendinosis of shoulder is well tolerated and shows a significant effectiveness for pain relief functional restoration and calcifications lithotrips with a mean satisfaction of 82±18 (VAS 0-10).

Laura Paulina Muñoz Velasco, MD; Lya Contreras del Toro, MD; Salvador Israel Macías Hernández; David Chávez Arias.

Objective: To assess the efficacy of platelet-rich plasma (PRP) intratendinous application for conservative treatment of supraspinatus partial tears. Design: Randomized controlled trial; Level of Evidence: 1. Setting: Tertiary care rehabilitation hospital. Participants: 34 patients with partial supraspinatus tear diagnosed clinically and by ultrasound were randomly assigned to receive a physical therapy program without (n=16) or with (n=18) intratendinous PRP application. Interventions: Ultrasound-guided intratendinous PRP application in supraspinatus. Both groups received a standardized rehabilitation protocol and were followed for 3 months. Main Outcome Measures: UCLA Constant-Murley scores, pain visual analog scale, and tear size using ultrasound measured initially and after 3 months in both Groups. Results: Of the original 34 patients 29 were seen at 3 months. Both groups showed statistically significant improvement in all scores at 3 months follow up compared to the pre-treatment scores (p< 0.001). There were no significant differences between both groups except in the Constant-Murley’s mobility item which was slightly higher for the control group. No adverse events related to PRP application were noted during the procedure. Conclusions: Conservative treatment with or without PRP is effective in reducing pain and improving mobility, function and strength in patients with supraspinatus partial tears. PRP didn’t add an extra benefit to conventional treatment.

No. 373 Aerobic Exercise Cognitive Behavioural Therapy and Combination of Treatment in Fibromyalgia Syndrome Patients: A Randomized Control Trial (Effect on Mood Related Disorder-A Preliminary Result). 
Boya Nugraha, PhD¹; Christoph Korallus, MD¹; Denise Dörffer¹; Sarah Zastrutzki Dipl Psych²; Stefanie Jasper, PhD²; Bürkard Jäger, PhD²; Christoph GutenBrunner c, MD Prof¹ (¹Dept. Rehabilitation Medicine); (²Institute of Psychosomatic and Psychotherapy, Hannover Medical School, Hannover Germany).

Disclosure: None. Objective: Fibromyalgia syndrome is a debilitating disease. This syndrome has many comorbidities in addition to pain including fatigue, mood related disorders, sleep disorder and others. The treatment for this syndrome consists of pharmacological treatment and non-pharmacological treatment. Although some studies have been done further research needs to be done to observe the benefit of non-pharmacological treatment on other symptoms related to mood related disorders such as anxiety and depression. Therefore this study was aimed to compare the effectiveness of different non-pharmacological treatments: aerobic exercise (AE), cognitive behavioural therapy (CBT), and combination of exercise and cognitive behavioural therapy (combination) and control in fibromyalgia syndrome patients. Design: Randomized controlled study. Setting: Non-pharmacological treatment in patients with fibromyalgia syndrome. Participants: 122 female fibromyalgia syndrome patients were randomly assigned to AE (n=30), CBT (n=29), combination (n=31) and control (n=32) group. They were treated twice per week for AE once a week for CBT and combination of twice per week of exercise and once a week of CBT for 12 weeks. Main Outcome Measures: Hospital anxiety and depression scale (HADS)-anxiety (HADS-A) and depression (HADS-D). Results: Analysis per protocol demonstrated that improvement showed in AE, CBT and combination groups for both anxiety and depression. Conclusions: All the non-pharmacological treatments in this study showed benefit to the patients regarding their mood related symptoms such as depression and anxiety. Reprinted with permission.

No. 374 Brachial Artery Blood Flow After Oxford and Delorme Exercises in Healthy Young Individuals: A Doppler Ultrasonographic Study. 
Sevgi Baspinar; Busra Uruk; Deniz Nur Soruklu; Ozgur Akgul; Salih Ozgocmen.

Objective: To compare the brachial artery blood flow volume (BAFV) and diameter in healthy young individuals after Oxford and Delorme exercises. Disclosure: None. Design: Serial measures observational study design. Setting: Gymnasium and musculoskeletal research unit of a tertiary care center. Participants: Twenty healthy non-smoking adults (10 male 10 female) of mean (standard deviation) age 28.35±3.25 years.
Methods: After baseline Doppler assessment of the arterial flow and diameter participants randomized into the DeLorme (DEL; n=10; 5M/5F) or Oxford (Ox; n=10; 5M/5F) resistance training (RT) protocols approved for the dominant arm. After completing the RT protocols participants underwent Doppler examination. Study was done in two different days in a cross-over design, ten individuals trained DEL protocol and the other 10 trained with Ox; second day RT protocol was cross changed to prevent bias. Main outcome measurements: baseline and post-exercise 1st, 3rd, 5th and 10th minute serial arterial diameter and BAFV were measured from the dominant and non-dominant brachial artery by using Doppler ultrasonography. Baseline and post-exercise arterial blood pressure heart rate and body temperature were measured in all participants. Sonographer and clinical assessor were blind to the exercise type. Level of Evidence: Level 1 Results: Baseline measurements were similar. There was a sudden increase and gradual decrease in the BAFV of dominant arm after DEL; however a relatively steady increase and gradual decrease after the OxF protocol. Area under the curve analysis revealed that post exercise BAFV was similar for both RT protocols on the dominant (p=0.07) and non-dominant arm (p=0.756). Post-exercise brachial artery diameter changes were similar between protocols. Conclusion: Although the time-flow pattern differs, both exercise protocols show similar changes in BAFV and diameter at the dominant and non-dominant arm in young healthy individuals.

No. 375 Effects of Prolotherapy on Patients With Primary Knee Osteoarthritis: A Prospective Uncontrolled Clinical Trial.
Presno-Rubín Diana Helena; González-Sánchez Mariana; Aceves-Dávalos Ana Eolina; Gómez-Toledo Carmina (Hospital Civil De Guadalajara Faa Guad. Jal. Mex).

Disclosure: None. Objective: To evaluate the short-term effects of prolotherapy with dextrose on knee pain, joint stiffness, and function in adults with symptomatic knee osteoarthritis (KOA). Design: Prospective uncontrolled clinical trial. Setting: Tertiary care general hospital (outpatient setting). Participants: Adults (45-70 years) with at least 6 months of symptomatic KOA recruited from clinical and community settings. Interventions: Participants received extra-articular injections of 15% dextrose and intra-articular prolotherapy injections of 25% dextrose at baseline, 4 and 8 weeks. Main Outcome Measures: The primary outcome measure was the validated Western Ontario McMaster University Osteoarthritis Index (WOMAC) designed to evaluate quality of life according to pain, joint stiffness and function. The second outcome measure was the validated analog visual scale (AVS) on which patients grade from 1-10 their knee pain level. Third the measure of knee flexion by goniometry. We performed all these measures at base-line, 4 and 8 weeks. Evidence Level: level 2. Results: We studied fifteen patients (aged 58±7.89; 9 females and 6 males). On WOMAC we found lower scores on all subscales at both 4 and 8 week follow-ups (compared to base-line). (pain: base-line=11.2±5.57, 4 weeks=8.67±4.67 and 8 weeks=6.8±4.93. Joint stiffness: base-line=4.67±2.41, 4 weeks=3.33±2.19 and 8 weeks=2.5±1.72. Function: base-line=38.13±17.9, 4 weeks=27.47±16.99 and 8 weeks=22.67±15.57). In all cases the differences were statistically significant (p<0.01). The AVS also showed a decrease score on each assessment (base-line=8±1.8, 4 weeks=6.3±2.58 and 8 weeks=5.5±3.38) both with p<0.01 compared with base-line. Knee flexion range showed an increase on both follow-up measures with statistical significance (p<0.01) compared with base-line (base-line=108.67±11.56°, 4 weeks=114.2±8.42 and 8 weeks=118.6±8.4°). Conclusions: In this population prolotherapy resulted in clinically meaningful short-term improvement on all measured variables pain, joint stiffness, function and knee flexion range on patients with knee osteoarthritis studies with larger populations and control groups are required for establishing definitive effectiveness.

Rodriguez Elidia; Ramirez Carolina; Serrano Yannely (School of Physical Therapy Industrial University of Santander-bucaramanga Santander Colombia).

Disclosure: None. Objective: To evaluate the intrarater reliability and agreement of visual analogue scale (VAS) (at rest palpation and after functional activities), goniometry of knee flexion and extension, the hand-held dynamometry (HHD) of quadriceps and hamstrings and the six-minute walk test (6-MWT) in persons with knee osteoarthritis (OA). Design: Evaluation of diagnostic technologies with cross-section sampling. The analysis included intraclass correlation coefficient (ICC 2K) and the bland and Altman’s limits of agreement. Setting: School of Physical Therapy Bucaramanga Colombia. Participants: 11 subjects were included 1 male and 10 females (64±7 years old) with medical diagnosis of knee OA.

Interventions: The measurements were standardized and then performed twice by examiner with an interval of 2 days between assessments. Before the first examination test each participant had a brief period of familiarization with the procedures. Main Outcome Measures: VAS (at rest palpation and after functional activities) for pain intensity, goniometric assessment of knee flexion and extension for the range of motion, HHD of quadriceps and hamstrings for muscle strength and 6-MWT for the functionality. Level of Evidence: Level 1. Results: The reliability of the goniometric measurements was good (ICC 0.96). The VAS at rest, palpation and after functional activities showed good reliability (ICC 0.93; 0.82; and 0.93, respectively). The reliability for the HHD assessment was good for quadriceps and hamstrings (ICC 0.97 and 0.93, respectively); and the 6-MWT showed good reliability (ICC 0.97). The agreement level was good for goniometry HHD and for VAS at rest and palpation and moderate after functional activities. Conclusions: The results indicate that the evaluated tests have good reliability and agreement level. Our findings support the use in controlled clinical trials. The measurement standardization and the familiarization are necessary to ensure confident results.

No. 378 The Effect of High Intensity Jumping Exercises on Bone Mineral Density in Sedentary Young Males Aged Between 18 and 25 Years.
Dilsad Sindel; Osman Coban; Aysegul Ketenci; Aydan Oral (Istanbul University, Istanbul, Turkey).

Disclosure: None. Objective: To investigate the effects of plyometric jump training of 9 months duration on bone mineral density (BMD) in sedentary young males aged between 18 and 25 years. Design: Prospective controlled interventional trial. Setting: School of physical therapy and rehabilitation. Participants: 44 sedentary young males meeting our inclusion criteria participated in the study. The participants were allocated into the exercise (n=24) and the control groups (n=20).

Interventions: Those in the exercise group performed high-intensity jumping training (jumping vertically, jumping vertically after squat position, forward backward and lateral jumping) for 30-45 minutes per session (including stretching and warming up) 3 times per week for a duration of 9 months. Main Outcome Measures: BMDs of the L1-L4 lumbar spine femoral neck and total hip were assessed using dual-energy x-ray absorptiometry (DXA) at baseline and 9 months later in both groups. We used paired samples t-tests to compare baseline and 9th month BMD in the groups. Level of Evidence: Level 1. Results: There were not any statistically significant differences between baseline and the 9th month BMDs in any region of interest in the exercise group. We observed a trend towards an increase in total hip and L1-L4 lumbar spine BMD. In the control group we found a statistically significant decrease in femoral neck BMD at
the end of 9 months. On the other hand there was not a statistically significant change between baseline and 9th month BMD values of total hip and L1-L4 spine. **Conclusions:** This study with a small sample size provides implications on the beneficial effects of plyometric exercise training on BMD at L1-L4 spine and the total hip. However it is not possible to make firm conclusions on the efficacy of high intensity jumping exercises on BMD in young sedentary males with a follow-up of 9 months.

**No. 379 Evaluation of Isokinetic Parameters of Trunk Flexors and Extensors of Healthy Adult Subjects in the State of Mexico.**
Adrian Tenorio Terrones, MD; Celia Itxelt Infante Castro, MD (Regional General Hospital no. 200, Tecamac State of Mexico).

**Disclosure:** None  **Objective:** To obtain parameters isokinetic peak torque and total work averaged of trunk flexors and extensors of healthy subjects in state of Mexico  **Design:** Observational prospective longitudinal study. **Participants:** A total of 49 healthy subjects after clinical assessment: 22 men (45%) and 47 women (55%) with a mean age of 33.8±10.7 years mean BMI of 23.9. Each participant was assessed with isokinetic equipment module version mxka tp500 2 times during 7 days a speed of 60 and 90°/s. **Interventions:** Not applicable  **Main Outcome Measures:** Flexors concentric average peak torque (FCAPT), extensors concentric average peak torque (EEAPT), extensors eccentric average peak torque (EEAPT), flexors concentric average total work (FCATW), extensors concentric average total work (ECATW) and extensors eccentric average total work (EATW) at 60°/s and 90°/s. **Level of Evidence:** III. **Results:** The light work activity in 88% 51% commented sedentary physical activity 29% practiced aerobic exercise anaerobic 8% and combined 12%. EEAPT 60°/s for male 177±56 nm and female 108±35 nm. FCAPT 60°/s for male 186±39 nm and female 112±36 nm. EEAPT 90°/s for male 132±91 nm and female 77±46 nm. FCAPT 90°/s for male 169±215 nm and female 104±153 nm. EEAPT 60°/s for male 399±177 nm and female 263±124 nm. EEAPT 90°/s for male 484±257 nm and female 270±147 nm. ECATW 60°/s for male 409±235 J and female at 296±144 J. FCATW 60°/s for male 317±281 J and female 227±174 J. ECATW 90°/s for male 607±210 J and female ±131 J. FCATW 90°/s for male 388±204 J and female 273±130 J. ECATW 60°/s for male 322±275 J and female 246±193 J. **Conclusions:** The average of FCAP and EEAPT at 60° and 90°/s lower by 43%. FCAPT and ECATW was higher by 14% than the national and international literature. It is suggested extend the sample to obtain more conclusive data and perform multicenter studies to validate index applicable to Mexican healthy subjects.

**No. 380 Application of Botulinum Toxin Type A in a Patient With Wartenberg’s Syndrome: A Case Report.**
Trujillo Millán Alejandro; Olivas Ortiz Javier; Gutiérrez Sandoval Jeanette.

**Location:** Toluca Edo, Mexico.  **Case Report:** 29-year-old female patient right handed without history of trauma, fracture, nor use any kind of splint at the right wrist. Presents Wartenberg's syndrome of 6 months of evolution corroborated by clinical evidence (Tinel Dellon’s test and paresthesias in right dorso-radial region) without improvement even though physiotherapy was given. Botulinum toxin type A (TBA) was applied to the patient at motor point of extensor carpi radialis longus (ECRL), extensor carpi radialis brevis (ECRB) and brachioradialis. Likewise evaluation was performed with DASH questionnaire and the Michigan questionnaire (MHQ) before and 6 weeks after the application of TBA. Treatment was supplemented by a program of physical therapy. **Results:** The patient had marked improvement of her symptoms especially decrease of paresthesias and Tinel disappearance as well as DASH score reduction from 45 to 33 and MHQ improvement from 47% to 68%. **Discussion:** This is the first case report with the use of TBA as treatment of Wartenberg's syndrome where good clinical and DASH/MHQ response were obtained. Application of TBA in the ECRB, ECRL and brachioradialis could decrease the compression of the sensory branch of the radial nerve which has been described between the muscle bellies of the ECRB, ECRL and brachioradialis by causing muscle atrophy and partial decrease in strength by the known mechanism of the TBA. **Conclusions:** The application of TBA could represent an alternative of easy application treatment low cost and reproducible in the conservative management of Wartenberg's syndrome when the compression is suspected between the ECRB, ECRL muscles and brachioradialis and there is no history of distal radius fracture, Quervain's disease or any other cause of external compression.

**No. 381 Eficacia de la Toxina Botulínica Tipo A Aplicada en Vasto Lateral y Cintilla Iliotibial en el Manejo Del Síndrome Doloroso Patelofemoral.**
A. Trujillo Millán; A. Izquierdo Heredia; E. Díaz Jaimes; Gutiérrez Sandoval J.

**Objetivo:** Evaluar la eficacia del tratamiento con toxina botulínica tipo A (TBA) en pacientes con síndrome doloroso patelofemoral (SDPF) aplicado en vasto lateral y cintilla iliotibial. **Diseño:** Se realizó un estudio prospectivo longitudinal experimental aleatorizado. **Ubicación:** Toluca. **Participantes:** 11 pacientes de entre 24 a 48 años de edad 18 rodillas en total con diagnóstico de sdpf sin antecedente de traumatismo enfermedad articular degenerativa o lesión derivada de prácticas deportivas. **Intervenciones:** Los pacientes fueron asignados en forma aleatoria para la aplicación de tba en cintilla iliotibial y vasto lateral y en los pacientes con SDPF bilateral en una de las rodillas se aplico placebo. Ambos grupos pasaron a un programa de rehabilitación física de 12 sesiones. Para la evaluación de los pacientes se aplicó la escala: anterior knee pain score (AKPS) antes y dos meses después de la aplicación de TBA. **Nivel de evidencia:** I. **Resultados:** De acuerdo al AKPS los valores obtenidos antes de la aplicación de tba fueron: promedio 48.81 puntos del grupo experimental y 55.77 puntos promedio del grupo control y a los 2 meses después de la aplicación de TBA promedio 64.18 puntos para el grupo experimental (diferencia de 15.37) y de 64.55 puntos promedio para el grupo control (diferencia de 8.78). La mejoría observada fue en el grupo experimental que en el grupo placebo principalmente en: uso de escaleras permanecer sentado con las rodillas flexionadas dolor intenso y movimientos anormales y dolorosos de la rótula. **Conclusiones:** La aplicación de TBA junto con un programa de ejercicios y osteotécnicas puede tener un rol importante estableciendo el balance muscular en pacientes con SDPF disminuyendo así la sintomatología. Este estudio proporciona una alternativa novedosa en el tratamiento de los pacientes con SDPF en los cuales otras alternativas no han sido suficientes.

**No. 383 Multidisciplinary Care of Muscle Strain Grade 2 in Left Gastrocnemius of a Football Center: A Case Report.**
Luis Gerardo Vázquez Villarreal; Jaime García Rodríguez, MD.

**Patient:** A 28-year-old male football center under sport medical supervision with muscle strain grade 2 on the left gastrocnemius. **Case Description:** Post-ultrasound diagnosis and clinical symptoms the athlete received multidisciplinary attention from sports medicine, physiotherapy and nutrition. In a period of 4 weeks; every 2 days he received cryomassage sessions, laser to 11000 Hz 18.0 joules for 6 minutes, kinesiology taping applications with 5-10% tensions. On the 2nd week closed kinetic chain exercises involving eccentric heel drop exercises were added. On the 3rd week functional exercises to the race and to maintain cardiovascular fitness were added. As an additional measure a reduction of daily caloric intake associated with the rest period was made. Oral supplementation was added with 1 gram daily of vitamin “C” for a month and 200 mg every 8 hours of...
hidromine for 10 days as a phlebotonic. The increase of his caloric intake linked to high intensity physical activity was made once the athlete returned to training. **Assessment/Results:** In addition to keeping weight and cardiovascular fitness during the rest period after 4 weeks of combined treatment the athlete returns to his workout training at the 6th week to game competition. **Discussion:** The multidisciplinary approach allows to extend the amount of therapeutic resources for the health and condition of our patient significantly decreasing injury rest periods. **Conclusions:** The multidisciplinary care with good communication is critical for timely recovery and reinstatement to the competitive environment of the athlete.

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**Alain Yelnik; Thomas Bardin, MD; Philippe Orcel; Johann Beaudreuil.**

**Objective:** The aim was the study of the value of active global (AG) and passive gleno-humeral (PGH) range of motion (ROM) for diagnosing adhesive capsulitis of the shoulder. **Setting:** Tertiary care hospital. **Participants:** 38 candidates to arthrodistension for adhesive capsulitis of the shoulder were included. Inclusion criteria were: limitation of AG (abduction or flexion $< 180^\circ$) and PGH (abduction or flexion $< 90^\circ$ or 25% reduction at less of lateral rotation as compared with the opposite shoulder) ROM and normal articular space on x-ray. **Main Outcome Measures:** Range of motion for adhesive capsulitis was a gleno-humeral capsular volume $< 12$ ml as assessed during the procedure of arthrodistension. **Main Outcome Measures:** AG and PGH ROM. **Results:** 31 of the 38 included patients satisfied to the reference criterion of adhesive capsulitis. Positive predictive value (PPV) of AG and PGH ROM was therefore 78%. PGH abduction only was correlated with the volume of the gleno-humeral capsule $r = 0.33$ p = 0.043. Using a threshold of $80^\circ$ for PGH abduction the PPV was 84%; for a threshold of $60^\circ$ 89% and for a threshold of $40^\circ$ 100%. **Conclusions:** Limitation of AG and PGH ROM has a high PPV (78-100%) for the diagnosis of adhesive capsulitis.

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### No. 385 Avascular Necrosis of the Femoral Head Due to Buerger’s Disease: A Case Report.

**Volkan Yilmaz; Ayca Uran, MD.; Koray Aydemir; Taner Dandingol (Gulhane Military Medical Academy Department of Physical Medicine and Rehabilitation Ankara, Turkey).**

**Disclosure:** None **Setting:** Tertiary care university hospital. **Patient:** A 41-year-old male with avascular necrosis (AVN) of the femoral head. **Case Description:** A 41-year-old right above-knee amputee was admitted to our department with pain of the left hip. He was diagnosed with Buerger’s disease (BD) 11 years ago. He had a two-year history of left hip pain. On physical examination, range of motion of the left hip was limited and Fabere test was positive on the left side. **Assessment/Results:** C-reactive protein level was elevated. X-ray of the left hip joint revealed narrowing of joint space. Magnetic resonance imaging revealed bone marrow edema, cortical depression and contour irregularity of left femoral head consistent with AVN. Doppler ultrasound showed lack of superficial femoral artery blood flow. Consultations from hyperbaric oxygen therapy and orthopaedics clinics were requested. Further developments will be discussed. **Discussion:** Although BD usually affects small and medium sized blood vessels, superficial femoral artery which is a large-sized vessel involvement was detected in our case. This circulatory disorder caused the AVN of the femoral head which is a serious problem. Appropriate radiological assessments are recommended for differential diagnosis of hip pain. **Conclusion:** Clinicians should be aware of this clinical entity in patients who complain from hip pain especially if risk factors exist. Reprinted with permission.

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### No. 386 Successful Surgery and Early Rehabilitation for Femoral Fractures in 6 Centenarians.

**Hideki Yumikake, Yoichiro Kikuchi, Shiro Hanakawa; Naoya Kobayashi.**

**Objective:** We report favorable outcomes of 6 centenarians (≥100 years) who underwent proximal femoral nail antitrotation (PFNA) fixation for fall-related injuries. **Setting:** A rehabilitation center of the 119-bed general hospital in Japan from April 2011 to September 2013. **Participants:** Six centenarians (mean age at injury 101.3 years; mean hospitalization period 31.2 days) underwent PFNA fixation during the study period. **Interventions:** Intraoperative interventions were provided to identify the surgical wound surgical technique and surgical fixation. Joint range of motion exercise, muscle strength maintenance training, and load-bearing control were initiated the day after surgery. Early ambulation, standing and walking trainings were conducted. **Main Outcome Measures:** Patients were assessed and examined before admission and after discharge using the Japanese Orthopedic Association hip score (JOA score), walking mobility and functional independence measure (FIM). **Results:** JOA score: affected side 42.7±29 points; healthy side 62.8±44 points; mobility: 3.5±3 (before fracture) to 3.3±3 points (4 weeks after therapy), FIM: 58±16 points (before fracture) to 76±46 points (4 weeks after therapy). **Conclusions:** Our results suggest that even for centenarians, early rehabilitation enables early ambulation and maintenance of mobility and activities of daily living.

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### VOCATIONAL REHABILITATION

**No. 387 Labor Market Participation of People With Spinal Cord Injuries in Switzerland: First Results From The Swiss Spinal Cord Injury Cohort Study (SWISCI).**

**Jan D. Reinhartd; Marcel W.M. Post; Bruno Trezzini; Martin Brinkhof.**

**Objective:** To describe labor market participation (LMP) of persons with SCI in Switzerland; to examine associations of LMP with demographic and injury related factors; and to compare LMP between SCI and general population. **Design:** Observational cross-sectional study. **Setting:** Community survey conducted in Switzerland. **Participants:** 1216 persons with SCI of working age. **Main Outcome Measures:** Current employment status. **Level of Evidence:** 1. **Results:** 53.8% of the participants were employed at the time of the study. Of those not employed, 48% had the desire to work and 54% felt able to work for at least up to 12 hours/week. Adjusted odds of being employed were increased for males (OR=2.0 95% CI: 1.5-2.7), participants with paraplegia (OR=1.9 95% CI: 1.4-2.5), traumatic SCI (OR=1.5 95% CI: 1.0-2.2), and those who had been employed at the time of SCI (OR=1.5 95% CI: 1.1-2.1). Complete injuries decreased the probability of being employed (OR=0.75 95% CI: 0.6-1.0). The likelihood of being employed showed a concave relationship with current age with a maximum at age 40. The odds of being employed increased asymptotically with formal education and linearly with time since injury. **Conclusions:** While the LMP of persons with SCI is comparatively high in Switzerland, the full LMP potential of people with SCI is still not realized. Females with complete tetraplegia and low education seem particularly at risk for not being employed.