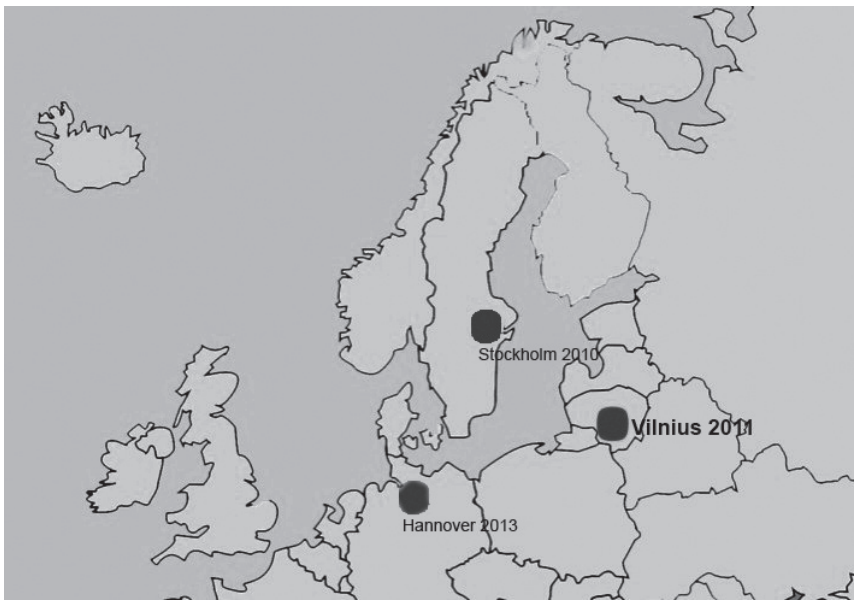
J Rehabil Med 2011; 43: 817–868

# 2nd Baltic and North Sea Conference on Physical and Rehabilitation Medicine "From Biomechanisms to Outcomes!"

*Vilnius, Lithuania*
*September 28–30, 2011*

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 ISSN 1650-1977
doi: 10.2340/16501977-0869

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**Main Sponsors**

Medtronic
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European Academy of Rehabilitation Medicine (EARM)
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## 2ND BALTIC AND NORTH SEA CONFERENCE ON PHYSICAL AND REHABILITATION MEDICINE "FROM BIOMECHANISMS TO OUTCOMES!"

IL = Invited lecture
OP = Oral presentation free communication
no number = abstract not available

### Track 1: Pain Chronification (IL01–07)

*Wednesday 28 Sept: 14.00–17.30*

**IL01** Pain chronification: From acute to chronic pain – A major clinical problem, *Troels S Jensen*

**IL02** Pain chronification: Functional and structural changes in the brain, *Carl Molander*

**IL03** From local to widespread pain and risk for chronification, *Hans-Georg Schaible*

**IL04** Pain chronification: diagnostics, assessment, and screening, *Eva Kosek*

**IL05** Pain chronification: Interventions and management, *Gunilla Brodda Jansen*

- Imaging of pain states: Can new MRI techniques visualize chronic pain? *Per Julin*

**IL07** Distress and pain chronification – findings in victims of torture, *Bengt Sjölund*

### Free Communications: Physical activity and exercise (OP 52–57)

*Wednesday 28 Sept: 16.00–17.40*

**OP52** What is the long-term benefit of progressive resistance training after stroke? A 4-year follow-up, *Ulla-Britt Flansbjer, Jan Lexell, Christina Brogårdh*

**OP53** Effects of resistance training in combination with IVIG treatment in patients with post-polio, *Katarina Skough, Kristian Borg, Marketta Henriksson*

**OP54** Effect of aerobic training on exercise capacity in patients with heart failure on early rehabilitation following acute myocardial infarction, *Nelli Bičkauskaitė, Dalia Mečkauskienė, Alfredas Rudys; Veronika Bartosevičienė, Saulė Meškauskienė, Romualda Leišienė*

**OP55** Isokinetic knee extension and flexion strength in individuals with hemiparesis after stroke, *Ulla-Britt Flansbjer, Jan Lexell, Christina Brogårdh*

**OP56** Brain natriuretic prptide in heart failure patients following acute myocardial infarction :Relationship with exercise tolerence and cardiac work in early rehabilitation, *Nelli Bičkauskaitė, Dalia Mečkauskienė, Alfredas Rudys*

**OP57** Interval hypoxic training as an efficient means in the complex of therapeutic measures in juvenile uterine dysfunctional bleedings, *Tetiana Dyba, Mariya Radziyevska, Pavlo Radziyevskyy*

### Track 2: Physical Activity and Aerobic Exercise (IL08–16)

*Thursday 29 Sept: 16.00–17.50 & Friday 30 Sept: 09.00–10.30*

- Basic and molecular mechanism of exercise – An update, *Bengt Saltin*

**IL09** Effect of exercise in motor unit disorders, *Kristian Borg*

**IL10** Critical illness myopathy in intensive care unit patients: Underlying mechanisms and rehabilitation strategies, *Lars Larsson*

**IL11** Effect of aerobic exercise in neurological conditions, *Frans Nollet*

**IL12** Exercise and mental health, *Andreas Ströhle*

**IL13** Potential of exercise in rehabilitation, *Gunnar Grimby*

**IL14** Preventing post-rehab health decline (PHD): Building networks from rehabilitation to community fitness, *James H. Rimmer*

- Physical activity on prescription for persons with functional limitations, *Carl Johan Sundberg*

**IL16** Sports for people with disabilities, *Jan Lexell*

### Special Issue Session 1. Acute and Early Post Acute Rehabilitation Programmes (IL 17–20)

*Thursday 29 Sept: 09.00–10.30*

- General aspects, *Henk Stam*

**IL18** Acute and early post acute rehabilitation in spinal cord injury, *Alvydas Juocevicius*

**IL19** Building up a research strategy within a rehabilitation hospital. An example from Sunnaas Rehabilitation Hospital in Norway, *Johan K. Stanghelle*

**IL20** Acute and early post acute rehabilitation in multiple trauma, *Jean-Jacques Glaesener*

**Free Communications: Pain Rehabilitation (OP43–49, 51)**
*Thursday 29 Sept: 09.00–10.30*

**OP43** With and without concomitant depression: differences in pain, functioning and quality of life between women on long-term sick-leave with musculoskeletal pain, *Gunilla Brodda Jansen, Jürgen Linder, Kristina Schüldt Ekholm, Jan Ekholm*

**OP44** NKT Cell, Th Cell and IL-6 in Patients with Fibromyalgia Syndrome, *Boya Nugraha, Christoph Korallus, Sarah Zastrutzki, Uta Hoppmann, Theodor Framke, Marcus May, Armin Koch, Stefan Engeli, Heike Nave, Ralph Lichtinghagen, Christoph Gutenbrunner*

**OP45** Variation of outcome among inpatient rehabilitation centres for persons with chronic back pain in Germany, *Thorsten Meyer*

**OP46** Dissonance between visual and proprioceptive information as a moderator in experimental pain, *Oliver Christ, Christoph Weber, Dorothea Borchert, Hardo Sorgatz*

**OP47** Chronic whiplash-associated disorders in Lithuanian patients following motor vehicle collision: an update, *Evelina Preisegolaviciute, Gintaute Samusyte, Jolita Janusauskaite, Kestutis Petrikonis, Indre Bileviciute-Ljungar*

**OP48** Magnets in pain therapy – Analysis of evidence, *Piotr Tederko, Marek Krasuski*

**OP49** Effect of physical rehabilitation program on indices of biogeometrical profile of the posture in patients with osteochondrosis after microdiscectomy in the lumbar spine, *Olena Lazarieva, Franswaz Fawaz, Vladimir Kormiltsev*

**OP51** Neuropathic pain: Drugs and physical analgesia, *Ivet Koleva, Radoslav Yoshinov*

**Free communications: Physical activity and exercise (OP58)**
*Thursday 29 Sept: 09.00–10.30*

**OP58** Effectiveness of supervised physical activity program in patients with type II diabetes mellitus, *Vilma Dudoniene, Indre Kavaliuniene*

**Free communications: Team work in rehabilitation (OP69–75)**
*Thursday 29 Sept 29: 09.00–10.30*

**OP69** Overview of Occupational Therapy in Baltic Countries, *Alma Cirtautas, Lolita Cibule, Signe Tomsone, Karin Lilienberg*

**OP70** Supervision in helping professions: The situation in Lithuanian social work, *Nijolė Večkienė, Indrė Dirgėlienė*

**OP71** Predictors of communication preferences of patients with chronic ischemic heart disease, *Lukas Gramm, Erika Schmidt, Desiree Kosiol, Erik Farin-Glattacker*

**OP72** Cooperation-oriented curricula for physicians and social workers, *Raimonda Brunevičiūtė; Nijolė Večkienė*

**OP73** Towards a development of evidence-based teamwork in rehabilitation medicine – A literature overview, *Marie-Louise Schult*

**OP74** A multiprofessional client-centred model for the use of compensatory strategies in brain injury rehabilitation, *Aniko Bartfai, Inga-Lill Boman*

**OP75** A Multiprofessional Habilitation Team – a child's resource of salutogenesis, *Vesma Priedit, Lolita Cibule, Dace Medne, Evita Trapsa, Zane Udre, Olga Toropkina*

**Free communications: SCI rehabilitation (OP78–79)**
*Thursday 29 Sept 29: 09.00–10.30*

**OP78** Pilot study of International Spinal cord injury Data Sets and SCIM-III for assessment and documentation, *Guna Berzina, Anda Nulle, Anita Vetra*

**OP79** Development of recreation program for persons with spinal cord injury, *Ramona Mieze, Anda Nulle*

**Special Issue Session 2: Participation Issues and Quality of Life (IL 21–23)**
*Thursday 29 Sept: 11.00–12.30*

**IL21** The ICF as a conceptual platform to specify and discuss quality of life and health-related notions, *Alarcos Cieza, Jerome Bickenbach, Somnath Chatterji*

**IL22** Quality of life – A meaningful and useful goal in rehabilitation? *Thorsten Meyer*

**IL23** Life satisfaction and disability, *Kerstin Fugl-Meyer*

**Special Issue Session 3: Rehabilitation Medicine Across Services: Coordinated Rehab Strategies (rehab planning, case management, coordination) (IL 24, 25, 28, 29)**
*Thursday 29 Sept: 14.00–15.30*

- Developing cross-sectional rehabilitation services – The international perspective, *Gerold Stucki, Christoph Gutenbrunner*

**IL25** Issues of rehabilitation systems in Baltic states, *Alvydas Juocevicius, Eva Soba, Aivars Vetra*

**IL28** Comprehensive management of spinal cord injury in Switzerland, *Hans-Georg Koch*

**IL29** Rehabilitation across sectors in Sweden, *Kristian Borg*

**Symposium 1: Research Strategies in Physical and Rehabilitation Medicine (IL 30–32)**
*Thursday 29 Sept: 11.00–12.30*

- Why RCT's are not always the best study design? *Henk Stam*
- Alternative designs in clinical research in PRM, *Hans Bussmann*

**IL32** Qualitative methods in rehabilitation research, *Ann Öhman*

**Symposium 2: Evidence-based Treatment in Long-term Pain – A Systematic Review of Current State of Science (IL33–36)**
*Thursday 29 Sept: 14.00–15.30*
*Sponsored by Journal of Rehabilitation Medicine*

**IL33** Evidence based treatment in long-term pain – A systematic review of current state of science – An introduction, *Jan Ekholm*

**IL34-36** Physical activity, manipulation, TENS and acupuncture as treatments in long-term pain – Where do we stand today? *Anne Söderlund*

**IL34-36** Behavioural medicine treatment in a physiotherapy frame work – A systematic review of evidence, *Pernilla Åsenlöf*

**IL34-36** The evidence for multimodal rehabilitation of patients with long-term pain, *Britt-Marie Stålnacke*

**Special Lectures (IL 26, 27, 37–41)**
*Wednesday 28 Sept: 16.00–17.40*

- European Curriculum for Sports Medicine, *Guy Vanderstraeten, Luc Vanden Bossche*
- Acute and early post acute rehabilitation in stroke, *Anthony Ward* (belongs to Special Issue Session 1)

*Friday 30 Sept: 11.00–13.00*

**IL38** Modern assistive technology in rehabilitation, *Crt Marincek, Mojca Jenko*

**IL39** Telerehabilitation: state of the art, *Daniel Wever, S. Kosterink, R. Huis in 't Veld, M. Vollenbroek, H. Hermens*

**IL40** What reductions in dependency costs result from treatment in an inpatient neurological rehabilitation unit for people with stroke? *M. Anne Chamberlain, R.J. O'Connor, R. Beden, A. Pilling*

**IL26** Development of social rehabilitation services in Estonia and the role of UEMS PRM section. Clinical affaires committee and European Social Fund in this process, *Varje-Riin Tuulik, Dagmar Narusson*

**IL27** Rehabilitation in Poland – History, current issues and perspectives, *Marek Krasuski, Piotr Tederko, Jolanta Kujawa*

**Free communications: The use of ICF in rehabilitation, (OP59–64)**
*Friday 30 Sept: 09.00–10.30*

**OP59** Feasibility of using an ICF-based Activity of daily life outcome measure, *Friedbert Kohler, Carol Connolly, Kim Stendara, Aroha Sakaria*

**OP60** Usefulness of International Classification of Functioning, disability and health (ICF) for patients after stroke, *Lina Butėnaitė, Dina Gerviatovič*

**OP61** Using the ICF Brief Core Set for stroke as an outcome measure in the rehabilitation day hospital setting, *Friedbert Kohler, Saba Asif*

**OP62** Application of ICF for patients after stroke, *Lina Butėnaitė, Dina Gerviatovič*

**OP63** Feasibility of using a checklist based on the International Classification of Functioning, Disability and Health as an outcome measure in individuals following lower limb amputation, *Friedbert Kohler, Jim Xu, Jeyanthi Arockiam, Cecelia Silva-Withmory*

**OP64** Patient classification as a new research strategy in medical rehabilitation. Results of the development of Rehabilitee-Management-Categories (RMK) – A demand- and performance-related patient classification in medical rehabilitation in Germany, *Karla Spyra, Nina Ammelburg, Stefanie Köhn*

**Free communications: Quality of Life. Causes for Injury (OP76–77, 81)**
*Friday, 30 Sept: 09.00–10.30*

**OP76** Response shift in quality of life assessment in patients with chronic back pain and chronic ischemic heart disease, *Michaela Nagl, Erik Farin-Glattacker*

**OP77** Analysis of Health-Related Quality of Life of Children with Special Needs in Riga City in 2009–2011, *Inese Svekle, Lolita Cibule, Aivars Vetra, Gundega Klauza, Guna Eglite*

**OP81** Reasons for fall injuries which caused hip fracture, *Atzmon Tsu, Arkady Galin, Zvi Segal, Dana Iluse*

**Symposium 3: Team Work in Rehabilitation Medicine**
*Friday 30 Sept: 09.00–10.30*

Introduction of Symposium/Panel discussion on team work in rehabilitation medicine, *Carl Molander*

**The Symposium/Panel Discussion is Based on the Discussions in the Pre-conference Multi National Workshops**

*Wednesday 28 Sept: 09.00–12.00:*

**Part 1:** The contribution of physical and rehabilitation medicine to rehabilitation team work
*Chair: Vera Neumann (Leeds, UK)*

**Part 2:** The contribution of physiotherapy to rehabilitation team work.
*Chairs: Monika Löfgren (Stockholm, Sweden) and Ieva Egle Jamontaite (Vilnius, Lithuania)*

**Part 3:** The contribution of occupational therapy to rehabilitation team work
*Chairs: Marie-Louise Schult (Stockholm, Sweden) and Alma Cirtautas (Vilnius, Lithuania)*

**Part 4:** The contribution of speech and language therapy to rehabilitation team work
*Chair: Edita Sirvydaite (Vilnius, Lithuania)*

**Part 5:** The contribution of psychotherapy to rehabilitation team work
*Chairs: Monika Dorn (Bad Eilsen, Germany) and Gunilla Östlund (Stockholm, Sweden)*

**Part 6:** The contribution of social work to rehabilitation team work.
*Chair: Nijole Veckiene ( Kaunas, Lithuania)*

**Free Communications: Return to work. (OP65–68)**

*Friday 30 Sept: 11:00–13.00*

**OP65** Barriers to and possibilities of returning to work after a multidisciplinary rehabilitation programme. A qualitative study, *Marie Alricsson, Rita Sjöström, Ragnar Asplund*

**OP66** Between unemployment and employment: experience of unemployed long-term pain sufferers, *Maria Glavare, Monika Löfgren, Marie-Louise Schult*

**OP67** Work Ability Index as a screening to identify the need for rehabilitation: longitudinal findings from the German Sociomedical Panel for Employees II, *Matthias Bethge, Friedrich Michael Radoschewski*

**OP68** Evaluation of a multidisciplinary rehabilitation programme with emphasis on musculoskeletal disorders. A 5-year follow-up, *Rita Sjöström, Ragnar Asplund, Marie Alricsson*

**Free Communications: Rehabilitation economy (OP 80)**

*Friday 30 Sept: 11:00–13.00*

**OP80** Comparison of expenditures on services or rehabilitative care in European countries, *Ulla Tangermann, Iris Brandes, Thorsten Meyer*

## LIST OF POSTERS

The sequence of the posters is based on the ICF-structure from Environmental factors to Body functions.

### *ICF METHODOLOGY, ENVIRONMENTAL FACTORS AND TEAM WORK*

**PP 01:** The interrater reliability of an ICF based ADL assessment tool. *Friedbert Kohler; Carol Connolly; Aroha Sakaria; Kim Stendara*

**PP 02:** Describing functioning and disability by using an adapted comprehensive ICF-core-set based profile with qualifiers, developed for patients with chronic pain conditions. *Philipe Njoo; Jan Ekholm; Monika Löfgren; Marie-Louise Schult*

**PP 03:** Adaptation of catholic churches' physical environment to needs of people with physical disability in Vilnius city. *Inga Raudonytė; Dainė Janonienė*

**PP 04:** Evaluation of patients' opinion about received procedures and rehabilitation team input in teaching the patients at a rehabilitation, physical and sport medicine centre. *Vilma Raškelienė; Irena Koncevičienė; Daiva Bielinytėa*

### *WORK, EMPLOYMENT, LEISURE*

**PP 05:** Adverse effects of effort-reward imbalance on work ability: longitudinal findings from the German Sociomedical Panel of Employees II. *Matthias Bethge; Friedrich Michael Radoschewski*

**PP 06:** Employment features of persons after spinal cord injury. *Aušra Adomavičienė; Juozas Bernatavičius*

**PP 07:** The opinion on volunteering among occupational therapy students at Vilnius University. *Alma Cirtautas; Neringa Marčiulynaitė*

**PP 08:** The need of additional leisure activities for patients with spinal cord injury in an acute rehabilitation unit. *Neringa Marčiulynaitė; Raimonda Kavaliauskaitė*

### *MOBILITY: WALKING, MOVING AROUND, HAND AND ARM USE. SELF-CARE.*

**PP 09:** Intra-rater test-retest reliability of the six minute walk test in subjects with post-polio syndrome. *Katarina Skough; Lisbet Broman; Kristian Borg*

**PP 10:** Measures used in stroke rehabilitation as predictors of walking capacity. *Inga Lokshinska; Anita Vetra*

**PP 11:** Measurement and Analysis of Foot Pressure Distribution in Preschool Children. *Līna Butāne; Zane Pavāre*

**PP 12:** Influence of gender, body mass index and age on patient's functional status during rehabilitation after knee replacement surgery. *Ligita Aučynienė; Ieva Eglė Jamontaitė; Jūratė Ramanauskaitė; Neringa Jankauskienė; Tadas Margelis; Jelena Lukjanova*

**PP 13:** Effects of Botulinum Toxin A on Upper Extremity Motor Function in Stroke Patients. *Min Cheol Joo*

**PP 14:** The impact of different physical therapy programs on stroke patients balance and functional independence. *Ieva Eglė Jamontaitė; Ieva Tvarijonienė; Jūratė Ramanauskaitė*

**PP 53:** Goal setting pertaining to upper and lower limb function in post-stroke spasticity (PSS) patients: the BOTOX® Economic Spasticity Trial (BEST) in Sweden, *P. Ertzgaard; K. Seigel; J. Biörklund; P. Säterö; A. Häggström; M. Edblom; K. Kullander; K. Lindgren; P. Åkerlund; J. Borg; N. Wright; the BEST study investigators*

**PP 54:** Active and passive goal attainment pertaining to upper and lower limb function in Swedish post-stroke spasticity (PSS) patients: the BOTOX® Economic Spasticity Trial (BEST), *P. Ertzgaard; K. Seigel; J. Biörklund; P. Säterö; A. Häggström; M. Edblom; K. Kullander; K. Lindgren; P. Åkerlund; J. Borg; N. Wright, the BEST study investigators*

### *MENTAL FUNCTIONS: INTELLECTUAL, ATTENTION, EMOTIONAL*

**PP 15:** Cognitive neurorehabilitation of attention in children with brain trauma and epilepsy using the computer-administered FORAMENRehab program. *Kirsi Masso; Triinu Müür; Evelin Visk; Mari-Liis Kaldoja; Anneli Kolk*

**PP 16:** Assessment of functional cognition for persons with dementia. *Karolina Laudobele; Zane Liepina*

**PP 17:** Relation between functional and emotional status for persons with SCI during rehabilitation. *Sigita Kilkutė; Neringa Marčiulynaitė; Jurgita Verbaitienė; Jūratė Kesienė*

### *MOVEMENT RELATED FUNCTIONS. EXERCISE.*

**PP 18:** Calf muscles dysfunction in stroke patients at the chronic stage revealed by velocity-encoded phase-contrast MRI. *Jiang Li; Dou Zu-lin; Chao Hong-yang; Kang Zhuang; Gu Ming*

**PP 19:** Contractile function of thigh muscles' effects on balance function in stroke patients. *Jiang Li; Dou Zu-lin; Wen Hong-mei; Qiu Wei-hong; Wei Xiao-mei*

**PP 20:** Features of surface electromyographic signals of thigh muscle in stroke patients. *Jiang Li; Dou Zu-lin; Wen Hong-mei; He Cui; Li Kui*

**PP 21:** Effects of rehabilitation training on lower extremity muscle function in chronic stroke patients revealed by velocity-encoded phase-contrast MRI. *Jiang Li; Dou Zu-lin, MD; Xie Dong-feng; Wen Hong-mei; Li Kui*

**PP 22:** Effects of strength training on thigh muscles in chronic stroke patients revealed by surface electromyography. *Jiang Li; Dou Zu-lin; Li Kui; Wei Xiao-mei; Wen Hong-mei*

**PP 23:** Normal calf muscle contractile function in vivo using VE-PC MRI during ankle flexion and extension movements. *Jiang Li; Dou Zu-lin; Wen Hong-mei; Chao Hong-yang; Kang Zhuang*

**PP 24:** Electromyographic analysis of the sternocleidomastoideus muscle during dynamic head movements. *Fausto Bérzin; Daniela Silva; Fabiana Forti; Maria Aranha*

**PP 25:** Electromyographic activity of the tibialis anterior muscle in different proprioceptive exercises. *Frederico Lizardo; Fausto Berzin; Delaine Bigaton; Daniela Oliveira; Gilmar Sousa*

**PP 26:** Characterization of muscular fatigue and bite force through electromyographic analysis in individuals with pain due to temporomandibular dysfunction. *Wanderley Jordão; Fausto Berzin; Antonio Guimarães; Mirian Nagae*

**PP 27:** Assessment of acute pain and biomechanics through and after pre and post electromyographic occlusal adjustment – A pilot study. *Liege Ferreira; Rosario De La Torre; Maria Bérzin; Mirian Nagae; Fausto Bérzin*

**PP 28:** Pain and muscle activity evaluation in an orthodontic surgical patient treated with occlusal adjustment – A clinical report. *Liege Ferreira; Rosario De La Torre Vera; Valério Almeida; Mirian Nagae; Fausto Bérzin*

**PP 29:** Electromyographic evaluation of upper limb muscles in men undergoing creatine supplementation. *Daniela Silva; Fausto Bérzin; Zenon Silva; Gilmar Sousa; Fabio Mitri*

**PP 30:** Evaluation of isokinetic trainings' influence on thigh muscle characteristics. *Jurga Jagelavičiūtė; Alvydas Juocevičius; Marius Panavas; Teresė Palšytėl*

**PP 31:** Physical activity and physical fitness evaluation of physiotherapy students of Vilnius University Medical Faculty. *Jurga Jagelavičiūtė; Teresė Palšytė; Alvydas Juocevičius; Aučynienė Ligita*

**PP 33:** Heterotopic ossification of the quadratus lumborum and erector spinae in a spinal cord injured patient. *Min Cheol Joo*

**PP 34:** Physical fitness among 25 to 35 years old visitors of dance aerobics and of gym. *Karīna Sosnovska; Dace Driba*

**PP 35:** Anthropometric parameters of 16–25 years old sprint kayakers. *Lasma Liepa; Dace Driba*

**PP 36:** Cardiorespiratory parameters of exercise capacity of healthy adults aged 40 to 60 years. *Andrius Ramonas; Jelena Čelutkienė; Asta Grigaliūnienė; Alfredas Rudys*

### *CARDIOVASCULAR AND RESPIRATORY FUNCTIONS. EXERCISE TOLERANCE.*

**PP 37:** Cardiovascular risk factor modification of patients who have experienced first-time myocardial infarction. *Lilita Catlakša; Daiga Pulmane*

**PP 38:** Multidimensional Health Locus of Control and cardiovascular capacity after heart attack rehabilitation as predictors of mood disorders. *Paulius Petraitis; Sigita Kilkutė; Alfredas Rudys; Asta Grigaliūnienė*

**PP 39:** Physical fitness of individuals with chronic spinal cord injury. *Alvydas Juocevičius; Teresė Palšytė; Jūratė Kesienė; Tomas Sinevičius*

**PP 40:** Ischemic heart disease patients' compliance with treatment recommendations and Quality of Life. *Vilma Raškelienė*

### *VOICE. SWALLOWING. URINATION. SKIN REPAIR FUNCTIONS.*

**PP 41:** The use of an electrical stimulation device in rehabilitation of patients with voice dysfunction. *Rasa Almanienė; Iveta Paulauskienė*

**PP 42:** Electrostimulation and its effect on elimination of swallow disorders in rehabilitation. *Vilmantė Kraujelienė; Edita Sirvydaitė*

**PP 43:** Functional recovery for patients with post-stroke urinary incontinence 6 months after stroke. *Illa Mihejeva; Anita Vetra*

**PP 44:** Frequency of patients with bedsores at an in-patient rehabilitation. *Irena Koncevičienė; Vilma Raskeliene*

### *SENSATION OF PAIN. TREATMENTS.*

**PP 45:** Influence of Different Education Programs to Activities and Participation in Patients with Low Back Pain. *Alvydas Juocevičius; Monika Jadzevičiūtė; Teresė Palšytė*

**PP 46:** Analysis of risk factors for the diabetic foot syndrome among type 2 diabetes patients. *Aija Fridvalde; Daiga Pulmane*

**PP 47:** Posture disorders among physiotherapy student. *Neringa Zakarienė; Dainė Janonienė; Teresė Palšytė; Jurga Jagelavičiūtė*

**PP 48:** Comparison of effects between an aquatic group and an non-aquatic individual physiotherapy group in lumbar disc herniation treatment. *Juozas Raistenskis; Judita Doveikienė; Eimantas Žeimys; Romualdas Sinkevičius; Lina Varnienė*

**PP 49:** Effect of a series of $H_2S$ mineral water bathing on pain in patients with fibromyalgia – A pilot study. *Boya Nugraha; Neues Lahusen; Fadime Candir; Christoph Gutenbrunner*

**PP 50:** Influence of a peat bath series on quality of life and mood state in patients with a herniated vertebral disc during an inpatient orthopaedic rehabilitation. *Hubert Janik; Cathleen Mau; Karin Kraft*

**PP 51:** Patient's expectations for treatment of moderate to unbearable pain. *Indre Vaitekonyte; Vaida Babachinaite; Alfredas Vaitkus; Jurate Sipylaite*

**PP 52:** Occupational therapy for persons with cervicobrachialgia using computer at work. *Rasa Barčytė; Alma Cirtautas*

## INVITED LECTURES

### *PAIN CHRONIFICATION (IL 01–07)*

**IL 01**

#### PAIN CHRONIFICATION: FROM ACUTE TO CHRONIC PAIN – A MAJOR CLINICAL PROBLEM

***Troels S. Jensen, MD, PhD***
*Department of Neurology and Danish Pain Research Center, Aarhus University Hospital, Aarhus, Denmark*

Our understanding of nociceptive processing and of plastic changes after persistent noxious input has increased considerably within the last two decades. It is now clear that long-lasting noxious stimulation, inflammation or damage to tissues may give rise to a neuronal hyperexcitability and to the development of persistent pain.

While relative short-lasting and moderate noxious input leads to reversible plastic changes, more intense and long-lasting noxious stimulation implies a risk for persistent and more profound changes in transmitters, receptors, ion channels and in neuronal connectivity. The possible transition from acute to chronic pain can be examined in different settings, but prospective studies are obvious important designs to direct follow the time course of a specific disease or intervention. In this presentation we will use examples from inflammatory, neuropathic and idiopathic pain conditions to illustrate the transition from acute to chronic with gradual development and subsequent maintenance of persistent pain. These two examples includes: postsurgical pain and neck injury following car accidents.

Surgery represent a unique tool for studying transition from acute to chronic, because patients can be studied carefully and standardised both before, during and after surgery. Examples of such post surgical pain with identification of risk factors will be described. Pain following sprain injuries to the neck after car accidents is another condition where the transition from acute to chronic can be studied. Again here risk factors for development of persistent neck pain can be identified.

The identification of individuals who are at risk for development of pain is of major importance because our ability to treat persistent pain is less satisfactory than to treat pain in the acute phase. When and if risk factors are identified there is a possibility to make early intervention to either prevent or minimize the risk for more profound and long-lasting plastic changes in the nervous system. These preventive measures include a wide range of treatments.

**IL 02**

#### PAIN CHRONIFICATION: FUNCTIONAL AND STRUCTURAL CHANGES IN THE BRAIN

***Carl Molander, MD, PhD***
*Karolinska Institutet, Stockholm, Sweden*

Chronic pain may be associated with severe loss of functioning and quality of life even when no obvious organic cause such as injury or inflammation can be demonstrated. This shows that chronic pain can exist with little or without ongoing nociceptive input. We then tend to approach the problem using psychologal concepts such as somatization and fear-avoidance. These concepts are bound to be reflected in alterations in brain function. Indeed, alterations that can be associated with different pain syndromes have been observed, using functional imaging, MR-morphometry, histology and electrophysiology. In the end, they reflect alterations in synaptic transmission and postsynaptic response patterns. When such altered response pattern become long-term, without simply reflecting neuronal pathological functional decay, we may talk about adjusted brain function or plasticity. Plasticity may be adaptive or non-adaptive to the individual.

This lecture will review some of the classical and recent findings regarding morphological and functional changes after injury and in different chronical pain states. As may be expected, some active regions are similar to most pain states, such as cingulate cortex, orbitofrontal cortex, insula and dorsal pons, wheras others can be linked to specific types of pain. A common finding is decrease gray matter in the regions (not related to reduced activity or medication), but it is difficult to say to what extent this reflects neuronal loss or reduced volume of neurons, glia or intercelllular substance. Furthermore, it is not known whether they preceed or succeed pain chronification in the investigated subjects, and whether they can be used to explain why some people develop chronic pain despite injury healing, when most people do not.

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3. Wood PB. Variations in gray matter associated with chronic pain. Curr Rheumatol Rep 2010; 12: 462–469.

**IL 03**

#### FROM LOCAL TO WIDESPREAD PAIN AND RISK FOR CHRONIFICATION

***Hans-Georg Schaible, MD, PhD***
*Institute of Physiology, University Hospital Jena, Germany*

Muscles, joints, bone are major sites of chronic pain. Even if the pain starts locally, e.g. during osteoarthritis in a particular joint, it becomes often widespread extending far beyond the afflicted region, at last in advanced states. Very often pain is initiated by a pathological process in deep tissue. In some cases, however, pain is arising from a lesion or a disease of the peripheral nerve, and in this case pain is rather neuropathic than nociceptive.

Most disease processes sensitize peripheral nociceptors for mechanical (and thermal) stimuli. Then the fibres respond much more vigorously to stimuli, and importantly, they induce "central sensitization". This means that nociceptive neurons in the spinal cord (and possibly also at other supraspinal sites of the pain matrix) are becoming more excitable towards their afferent inputs. As a result the receptive fields of these neurons become enlarged. Humans display larger areas of mechanical hyperalgesia upon local stimulation beyond the original site of injury or inflammation.

Under normal conditions descending pathways from the brainstem have the potential to keep the spinal cord under control but during chronic pain descending inhibitory systems may be out of order, and descending facilitatory pathways aggravate the spinal cord processing. It is usually assumed that these processes of central sensitization are not only responsible for the spreading of pain but also for chronification of pain. Part of the changes can be reversible if the primary disease process is successfully treated.

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**IL 04**

## PAIN CHRONIFICATION: DIAGNOSTICS, ASSESSMENT, AND SCREENING

***Eva Kosek, MD, PhD***
*Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden*

Increased awareness of the importance of central nervous system (CNS) pain modulatory mechanisms for the chronification of pain has lead to a major scientific breakthrough. Although peripheral pathology such as radiological changes in osteoarthritis or muscle ischemia in muscular pain can be documented the relation between the degree of peripheral pathology and pain is generally weak. However, it is considered to initiate and maintain the CNS dysfunction. Using quantitative sensory testing, a general increase in pain sensitivity has been documented in many chronic pain conditions such as osteoarthritis (OA), rheumatoid arthritis, chronic low back pain (CLBP) and fibromyalgia (FM) and recently these abnormalities were supported by functional magnetic resonance imaging (fMRI) studies showing increased cerebral pain-related activation following nociceptive stimulation in FM and CLBP patients (1, 2). Furthermore, a dysfunction of endogenous pain inhibitory mechanisms has been reported in patients with OA and FM and could be verified in FM patients using fMRI (1). Epidemiological studies show that localized pain is the main risk factor for development of chronic widespread pain. Clinically, spread of spontaneous pain continuously and as referred pain is characteristic and is often accompanied by spread of tenderness. Although referred pain can be induced in healthy individuals, facilitation of referred pain has been reported in chronic pain patients most likely due to central sensitization (3). Clinical assessment of pain chronification should always include a pain drawing and assessment of widespread tenderness by palpation. Quantitative sensory testing can be used not only to assess generalized allodynia/hyperalgesia, but also to characterize temporal summation (central sensitization) and investigate the function of pain inhibitory mechanisms in individual patients. Although, these methods are currently mostly used for research purposes there is a need to develop simple, clinically useful methods to diagnose dysfunction of CNS pain regulatory mechanisms. The latter becomes even more important since many pain medications, such as serotonin-noradrenalin re-uptake inhibitors, actually target CNS mechanism and many rehabilitation methods such as physical exercise makes use of activation of endogenous pain regulatory systems (4).

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4 Lannersten L, Kosek E. Dysfunction of endogenous pain inhibition during exercise with painful muscles in patients with shoulder myalgia and fibromyalgia. Pain 2010; 151: 77–86.

**IL 05**

## PAIN CRONIFICATION: INTERVENTION AND MANAGEMENT

***Gunilla Brodda Jansen, MD, PhD***
*Department of Pain Management, Capio St Göran's Hospital, Stockholm, Department of Clinical Sciences, Division of Rehabilitation Medicine, Karolinska Institutet, Danderyds Hospital, Stockholm, Sweden*

Longstanding generalised pain is one of the major causes for disability and sick leave in western countries and many efforts have been made to find out the causes behind longstanding pain and chronification. Before persisting pain occurs, there is often a prodrome of acute pain, transforming to a generalised pain state over a period of time.

One of the major enigmas in treatment regimes, is to address the pain in a bio-psycho-social way and to clarify what aspects are important in pain amplification, decrease in activity and function, and pain maintaining factors such as catastrophic thoughts, anxiety and depression. To be able to treat each individual patient with persistent pain it it important to carry out a thorough assessment in the beginning of the treatment period. The assessment must be structured and cover both somatic as well as psychiatric and social aspects to be able to find an individual treatment strategy for the patient. All treatment efforts should be in a multidisciplinary fashion in order to improve function and working capacity.

The aim of the presentation is to discuss how assessment and treatment can be carried out for the patient group in order to cover all aspects of pain. To measure and diagnose not only the somatic and psychiatric diagnose according to ICD-10, the International Classification of Functioning Disability and health, ICF, will be discussed as well as outcome measures and and guidelines for rehabilitation.

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**IL 06**

## IMAGING OF PAIN STATES: CAN NEW MRI TECHNIQUES VISUALIZE CHRONIC PAIN?

***Per Julin, MD, PhD***

Abstract is missing.

**IL 07**

## DISTRESS AND PAIN CHRONIFICATION – FINDINGS IN VICTIMS OF TORTURE

***Bengt H. Sjölund, MD, PhD***
*Department of Rehabilitation, University of Southern Denmark, Odense, Denmark*

Chronic pain is the most common physical complaint in torture victims (> 80% of cases), even 5–10 years after the torture incident. Traditionally, this has been seen as secondary to the mental sequeleae of torture, i e psychogenic pain, and has been treated accordingly. However, several studies from the Rehabilitation and research centre for torture victims in Copenhagen (RCT), have demonstrated that both nociceptive and neuropathic pain conditions are present in patients referred for treatment many years later (Thomsen et al 2000; Olsen et al 2006; Prip & Persson 2008). Patients with these pain conditions are characterized by major disability (Prip et al 2010), its severity depending on the location of their pains.

It is reasonable to assume that the most common form of physical torture, hard blows to the body, may create permanent tissue injury, either to skin, muscle, bone, inner organs or to the peripheral and/or central nervous system. Therefore, there are rich possibilities that peripheral pain generators are formed, of both nociceptive and neuropathic subtypes. In addition, the intense, long lasting and uncontrollable stress during torture episodes, often recurring for extended time periods, may permanently alter central nervous system function and structure (Bremner et al 2008). In addition, direct head trauma may negatively affect higher brain functions. By comparing sensory thresholds and tolerance in individuals with posttraumatic stress disorder (PTSD) to those with anxiety disorder and to controls, Defrin et al (2008) found signs of altered sensory processing in PTSD patients, resembling hyperpathia. However, in a cohort of torture victims referred for rehabilitation to RCT, we recently found severe anxiety and depression in all subjects but with little or no correlation to pain symptoms or to sensory thresholds (Prip et al, in preparation).

In summary, existing data underline the importance of an interdisciplinary approach to rehabilitation of torture victims (Sjölund et al., 2009) recognizing mental and also somatic problems. The recent findings that most torture victims seeking treatment in rehabilitation centers of Eastern Europe are local citizens, rather than third world refugees (Doro, 2010), further illustrates the need to increase the awareness of these findings.

## *PHYSICAL ACTIVITY AND AEROBIC EXERCISE (IL 08–16)*

### IL 08

### BASIC AND MOLECULAR MECHANISM OF EXERCISE – AN UPDATE

***Bengt Saltin, MD, PhD***

Abstract is missing.

### IL09

### EFFECT OF EXERCISE IN MOTOR UNIT DISORDERS

***Kristian Borg, MD, PhD***
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Motor units loss is compensated by different phenomena in order to maintain muscle strength. The most powerful compensation is reinnervation by means of collateral sprouting from surviving motor units. The contractile tissue is increased by means of muscle fibre hypertrophy and the contractile properties are changed both in the motor neurone with altered firing properties and in the muscle fibre with altered isomyosin content.

Poliomyelitis affects anterior horn cells leading to a loss of motor units and when there is a critical degree of muscle weakness there is a compensation with increased use of remaining motor units. This leads to an increase of the motor unit area and altered firing properties of the motor neurone and an increased proportion of slow-twitch muscle fibres as well as muscle fibre hypertrophy.

The compensatory effects have implications for the strategy of rehabilitation interventions in patients with disorders of the motor unit.

### IL 10

### CRITICAL ILLNESS MYOPATHY IN INTENSIVE CARE UNIT PATIENTS: UNDERLYING MECHANISMS AND REHABILITATION STRATEGIES

***Lars Larsson, MD, PhD***
*Department of Neuroscience, Clinical Neurophysiology, Uppsala University, Uppsala, Sweden*

Severe muscle wasting and impaired muscle function accompany critical illness in intensive care unit (ICU) patients with negative consequences for recovery from primary disease and weaning from the respirator. While ICU outcome has traditionally focused simply on survival, modern critical care also addresses post-ICU complications and quality of life. Several recent studies show unambiguously that neuromuscular dysfunction, resulting in muscle wasting and weakness is the most persistent and debilitating of problems for survivors from the ICU for as long as two years after hospital discharge. Critical illness myopathy (CIM) is considered a consequence of modern treatment in anesthesiology and intensive care. Patients with CIM are characterized by weakness/paralysis and preferential myosin losses in spinal nerve innervated muscles with craniofacial muscles being spared or less affected and intact cognitive and sensory function. The understanding of basic mechanisms underlying CIM in the clinical setting is poor, in part due to the fact that the generalized muscle weakness is complicated by different underlying disease, polypharmacy, age, gender, and collection of muscle samples several weeks after admission to the ICU. There is, accordingly, compelling need for experimental animal models mimicking the ICU conditions. In an attempt to mimic the ICU condition, we have used novel large (porcine) and small (rodent) experimental ICU models in time resolved studies in parallel with clinical studies in ICU patients. Specific interest is focused on regulation of myofibrillar protein synthesis and degradation at the gene level, protein expression at the muscle fiber level, and regulation of muscle contraction at the single muscle fiber level. We propose that, for those critically ill patients who develop CIM, complete mechanical silencing, due to pharmacological paralysis or sedation, is a critical factor underlying the preferential loss of the molecular motor protein myosin that leads to impaired muscle function or persisting paralysis. This is supported by the muscle mass/sparing effect of passive mechanical loading in an experimental ICU model as well as in clinical studies in ICU patients suggesting a paradigm shift in the view of physical therapy in ICU patients from late therapy aiming at reducing joint contractures to very early passive physical loading to reduce loss of muscle function and mass.

### IL 11

### EFFECT OF AEROBIC EXERCISE IN NEUROLOGICAL CONDITIONS

***Frans Nollet, MD, PhD***
*Department Rehabilitation, Academic Medical Center, University of Amsterdam, The Netherlands*

Although the impairments in many major neurological disorders such as stroke, multiple sclerosis, or Parkinson's disease, are different, they have in common that patients are usually reduced in their physical activity. Multidisciplinary rehabilitation focuses on the restoration or the preservation of abilities, by relearning or by learning of compensatory strategies, on the psychosocial consequences, and on improving participation. Less attention is given to the preservation of body functions, especially cardiorespiratory fitness, although due to diminished physical activity cardiorespiratory condition will be reduced and likely even worsens over time. The negative consequence of reduced cardiorespiratory fitness is that patients become less capable to meet the physical demands in daily life and, that it may negatively affect perceived health and may cause or increase fatigue.

Aerobic exercise aims to improve cardiorespiratory fitness and at present gains interest in many conditions, such as in diabetes and oncology rehabilitation, to reduce fatigue and improve quality of life. Aerobic exercise puts high motivational demands on the patient as protocol adherence with respect to frequency, duration, and intensity is essential for its effectiveness. Also a training period of at least 3 to 4 months is required to reach effects and even then, patients should continue their exercise in order to sustain the beneficial effects. At present, the implementation of aerobic exercise in the home environment can be facilitated by technological developments, using interne technology to monitor adherence and create virtual training groups.

The evidence for the effectiveness of aerobic exercise for the major neurological diseases varies. More studies are needed. Important issues that have been addressed in the literature to be delt with in future studies are that attention needs to be given to determining the optimum training intervention with respect to quantity and intensity and that agreement on common outcome measures is needed.

## IL 12

## EXERCISE AND MENTAL HEALTH

***Andreas Ströhle, PhD***
*Department of Psychiatry and Psychotherapy, Charité, Universitätsmedizin Berlin, Berlin, Germany*

Physical activity and exercise have been associated with a reduced prevalence and incidence of mental disorders, although the question of causality is still a matter of debate. In addition, exercise training has been used as (an additional) treatment for different mental disorders. However, adequately powered randomized controlled clinical trials are sparse and most evidence is available for anxiolytic and antidepressive effects of aerobic exercise training (1). Potential mechanisms for the therapeutic efficacy of exercise include metabolic, physiological as well as psychological mechanisms.

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## IL 13

## POTENTIAL OF EXERCISE IN REHABILITATION

***Gunnar Grimby, MD, PhD, FRCP***
*Section of Clinical Neuroscience and Rehabilitation, Sahlgrenska Academy at University of Gothenburg, Sweden*

The use of exercise training in rehabilitation has a long history, even if its clinical applications have increased markedly in recent years. Of importance for the theoretical as well as practical development was the increased knowledge in exercise physiology starting more than 60–70 years ago in Scandinavia but also in USA. Clinical tests for physical and aerobic work capacity were developed and reference material from normal population become available as also a successively increasing understanding of the mechanisms for the physiological adaptation with aerobic training. Aerobic type of training was started in patients after cardiac infarction, patients with respiratory diseases and with back and joint diseases and also in psychiatric and neurological conditions. A few examples from early studies in those groups will be presented. The possibility to use training also in rather physical limited groups have been explored by using e g ”peripheral ” type of training (combining training of different muscle groups), and modifying training length and intensity. Also training after the initial rehabilitation period using group training and nowadays also invidualised prescription of training has become more available. Evidence for prescribing exercise as therapy in chronic conditions has been published recently, e g by Pedersen & Saltin (2006), and 2010 in an English version of Swedish guidelines ”Physical activity in the prevention and treatment of disease” presented in this session.

The aim of physical training as part of rehabilitation can be summarized:

- To avoid unnecessary inactivity and to reach and maintain a sufficient level of physical fitness for activities in daily life
- To get specific treatment effects in different health conditions
- To get psychological effects and effects on general wellbeing
- To get secondary preventive effects

Some pertinent areas for future research and clinical implications are:

- Importance of daily activities for maintaining function and as preventive measure
- Specificity of various training models, as transfer effects and effects on different physiological and metabolic functions and on training specificity for different patho-physiological conditions
- Interaction of physical and mental activity on brain plasticity

## IL 14

## PREVENTING POST-REHAB HEALTH DECLINE: BUILDING NETWORKS FROM REHABILITATION TO COMMUNITY FITNESS

***James H. Rimmer, PhD***
*University of Illinois at Chicago, Department of Disability and Human Development, and Northwestern University, Department of Physical Medicine and Rehabilitation, Chicago, IL, USA*

Much of the decline in health after acquiring a disability and returning home from the hospital is associated with physical inactivity, referred to as Post-Rehabilitation Health Decline (PHD). As patients transition out of rehabilitation, PHD is caused by high rates of physical inactivity leading to severe deconditioning, obesity and further disability and health decline. There is a small window of opportunity for physical medicine and rehabilitation professionals to recommend to their patients effective strategies for continuing the recovery process in the community using existing fitness facilities. Unfortunately, most community-based fitness facilities are not accessible for people with disabilities, which limits opportunities for their recovery after they return home. For this reason, the U.S. has established a new certification sponsored by the American College of Sports Medicine and National Center on Physical Activity and Disability (www.ncpad.org) called the Certified Inclusive Fitness Trainer (CIFT). The CIFT acquires the skills and knowledge to provide disability-friendly fitness settings and safe and effective fitness programs for a range of disabilities. This presentation will provide the audience with a conceptual framework for transitioning patients from rehabilitation to community-based fitness, and will share resources and tools that can be used to track and monitor progress in health and fitness in patients with disabilities. The national inclusive fitness effort that has recently started in the U.S., which is focusing on removing physical, social, and attitudinal barriers that discourage people with disabilities from using exercise facilities, is a good model for other countries to consider adopting in an effort to prevent PHD. Physical medicine and rehabilitation professionals have a unique opportunity to bridge the existing gap between rehabilitation and community fitness in helping their patients with disabilities reduce their risk of secondary health conditions associated with deconditioning and physical inactivity, while offering them in return a higher quality of life and reduced health care utilization.

Objectives of this lecture:

1. Describe a model that transitions patients from rehabilitation to community exercise.
2. Develop strategies for facilitating post-rehabilitation community exercise in patients with disabilities.
3. Increase awareness of assessment tools used to promote fitness and physical activity in people with disabilities.
4. Identify resources to assist in promoting community exercise in patients with disabilities.

## IL 15

## PHYSICAL ACTIVITY ON PRESCRIPTION FOR PERSONS WITH FUNCTIONAL LIMITATIONS

***Carl Johan Sundberg, MD, PhD***

Abstract is missing.

**IL 16**

## SPORTS FOR PEOPLE WITH DISABILITIES

***Jan Lexell, MD, PhD***
*Department of Rehabilitation Medicine, Skåne University Hospital, Department of Health Sciences, Lund University, Lund, Sweden, and The Swedish Sports Organization for the Disabled and The Swedish Paralympic Committee*

Participation in society is an overall goal of all rehabilitation. Returning to meaningful leisure activities, in particular physical activity and sports, is a central component of societal participation. Sport is an effective means of augmenting rehabilitation outcomes for people with disabilities. People with disabilities should therefore have the right to participate in sports and have the same opportunities as able-bodied people. Sports for people with disabilities and the Paralympic Movement is an evolving area. Since the start some 60 years ago, the Paralympic Movement and its governing body the International Paralympic Committee (IPC) has experienced exponential growth in the number of sports as well as the number of athletes competing in the Paralympics, the second largest sporting event in the world. Research involving the Paralympic athlete is also an evolving area encompassing basic science, applied science, social science, nutrition, and performance enhancement in both hot and cold environments. This lecture will present an overview of the clinical and scientific area of sports for people with disabilities and the Paralympic Movement.

# *ACUTE AND EARLY POST ACUTE REHABILITATION PROGRAMMES (IL 17–20)*

**IL 17**

## GENERAL ASPECTS

***Henk Stam, MD, PhD***

Abstract is missing.

**IL 18**

## ACUTE AND EARLY POST ACUTE REHABILITATION IN SPINAL CORD INJURY

***Alvydas Juocevicius, MD, PhD***
*Rehabilitation, Physical and Sport Medicine Department, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

*Introduction:* Spinal cord injury (SCI) leads to severe functional loss and disability. Comprehensive rehabilitation in the acute and early post-acute phase gives opportunity for SCI patients to achieve a more independent level of social life. *Aim:* To analyse outcomes of a Physical and Rehabilitation Medicine program of care for patients with SCI, which has been accredited by the Committee for Clinical Affairs of UEMS PRM Section. *Methods:* Evaluation of the improvement of the quality of rehabilitation care delivered by the Center of Rehabilitation, Physical and Sports Medicine of Vilnius University Hospital Santariskiu Klinikos was done. Outcomes of a comprehensive rehabilitation program for patients with SCI were assessed. The action plan in 2008 for the program was made according to its weak points; ICF instruments for assessment of outcomes were implemented, vocational rehabilitation means, and home rehabilitation were extended. *Results:* The previous accreditation process and promotion of the program was a good opportunity to get the team together, to assess the team work systematically, to pay attention to some weak aspects of the program. The process was an additional motivation to look at the team cooperation in every-day practice. Our analysis of the comprehensive rehabilitation program outcomes in 2010 shows that the altered accredited rehabilitation program promoted changes in the direction of international evidence-based standards. After completion of the acute and early acute comprehensive rehabilitation of patients after SCI, the differences became statistically reliable between functional status of patients at admission and discharge. The length of stay in the rehabilitation program of those patients was shorter. *Conclusions:* Participation in an accreditation process is a good opportunity to improve quality of a rehabilitation program based on the bio-psycho-social model, to motivate work of the multidisciplinary team and to achieve evidence-based international standards.

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**IL 19**

## BUILDING UP A RESEARCH STRATEGY WITHIN A REHABILITATION HOSPITAL. AN EXAMPLE FROM SUNNAAS REHABILITATION HOSPITAL, NORWAY

***Johan K. Stanghelle, PhD, MD***
*Sunnaas Rehabilitation Hospital, University of Oslo, Norway*

The main aim of this presentation is to give an example on how to build a research strategy also within a rehabilitation hospital with limited academic traditions. Sunnaas Rehabilitation Hospital (Sunnaas) is a specialised rehabilitation hospital, partly with national services for 4.9 million people and partly with multiregional or regional services, especially for the South-Eastern Norway region with 2.7 million inhabitants. Sunnaas is affiliated to the University of Oslo, but had limited academic activities until the start of a strategic plan for research from 2003.

This strategic plan was built upon an international evaluation through The Research Council of Norway in 2003, concluding that Sunnaas had good possibilities for doing research because of the unique and representative patient population. However, it would be advisory and necessary to give a higher priority for research from the administrative side, to build up a department of research and to develop the connections to universities for all professions within rehabilitation. Based upon these advices, the administration at Sunnaas determined to make a strategic plan for research, including building up a department of research, increasing the internal budget for research from 0.7% to 7% of the total budget, and enhancing university positions. The strategic plan for research is thereafter followed closely by the board of the hospital.

So far, this strategy has led to an increase in university positions from 2 (MDs) till totally 10 (4 MDs, 1 psychologist, 2 nurses, 1 PT, 1 OT, 1 ST), including 3 guest professors. The number of PhDs among the staff has increased from 6 till 20, there are still 18 PhD students of all professions, and international publications have increased significantly. The budget for research has so far reached almost 4%. Most important activities for the internal attitude for research have probably been the obligatory courses in evidence-based medicine and the combined positions clinics/research on postdoc level.

The presentation will hopefully give encouraging advices on how to improve research activities, and especially on how to cooperate with the administration about a most fruitful development within research in our field.

**IL 20**

## ACUTE AND EARLY POST-ACUTE REHABILITATION IN MULTIPLE TRAUMA

***Jean-Jacques Glaesener, MD***
*Centre of Rehabilitation Medicine, Hamburg, Germany*

Early rehabilitation as part of the stroke unit concept has been shown to be responsible for better results after stroke. For multiple trauma too, rehabilitation has to start as early as possible, i.e. at the Intensive Care Unit and continue at the Intermediate Care Unit for Early Rehabilitation to obtain an optimal result, although there

is still a lack of published evidence for this. The comparison of 2 groups of patients with multiple trauma with different time-slots between the accident and the start of rehabilitation were compared concerning the functional results and complications.

The Center of Rehabilitation Medicine Hamburg, in charge of 186 rehabilitation beds, is part of the Workmen's Compensation Hospital, a highly specialized Trauma Center.

In 16 beds we are prepared to take over still ventilator-dependent patients for subsequent acute rehabilitation. From 2008–2010 we have treated 120 patients with multiple trauma in different rehabilitation settings. Forty patients had an acute rehabilitation, starting in the first days after trauma and 80 had an early post-acute rehabilitation as they were transferred to our service from other hospitals, days or weeks after multiple trauma.

We will show the differences in length of stay, outcome etc. between the 2 groups and point to the objectives of acute and post-acute rehabilitation besides the different duties like management of the airways/prophylaxis of pneumonia, prophylaxis of contractures and decubital ulcers etc.

Acute and early rehabilitation requires a high level of interdisciplinarity of the medical subspecialities due to concomitant medical problems, internal complications and age of the patients and multidisciplinarity of the therapeutic team as well as extraordinary motivation and commitment.

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## *PARTICIPATION ISSUES AND QUALITY OF LIFE (IL 21–23)*

### IL 21

### THE ICF AS A CONCEPTUAL PLATFORM TO SPECIFY AND DISCUSS QUALITY OF LIFE AND HEALTH-RELATED NOTIONS

***Alarcos Cieza, PhD[1]; Jerome Bickenbach[2]; Somnath Chatterji, PhD***

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*Objective:* The aim of this paper is to use the ICF as a conceptual platform to specify and discuss quality of life and health-related notions. *Methods:* Health and health-related domains and functioning as described in the ICF represent entities based on which well-being, health and health-related states, health status, and functioning status, Quality of Life (QoL) and Health-Related Quality of Life (HRQoL) can be described and discussed. Health domains refer to domains intrinsic to the person as a physiological and psychological entity. Health-related domains are not part of a person's health but are so closely related that a description of a person's lived experience of health would be incomplete without them. Functioning refers to all health and health-related domains within the ICF. *Results:* Well-being is made up of health, health-related, and non health-related domains, such as autonomy and integrity. Functioning refers to health, health-related domains. QoL is the individual's perceptions of how the life is going in health, health-related, and non-health domains. HRQoL is the individual's perceptions of how the life is going in health and health-related domains. *Discussion:* "HRQoL is to QoL what functioning is to well-being". The ICF represents a standardized and international basis for the operationalization of health based on its health domains. The ICF is also the basis for the operationalization of functioning based on all health and health-related domains contained therein. Nevertheless, the ICF provides more than a basis for the operationalization of health and functioning. The ICF also contains contextual factors. The conceptual definition of health remains open and flexible, even vague and ambiguous. Health is not only a rarely achievable and never sustainable goal and component of well-being, it may well be an enigmatic goal as well.

### IL 22

### QUALITY OF LIFE – A MEANINGFUL AND USEFUL GOAL IN REHABILITATION?

***Thorsten Meyer, PhD***

*Hannover Medical School, Institute for Epidemiology, Social Medicine and Health Services Research, Germany*

*Introduction and aim:* The term quality of life (QoL) has become popular in the field of rehabilitation. Discussions surrounding the further development of a conceptual description of rehabilitation (1) were characterized by disputes on the role of QoL as a meaningful and useful concept for outcome in rehabilitation. The present paper aims to highlight different conceptual backgrounds of the term QoL and discuss their relevance as possible goals of rehabilitation. *Methods:* Based on a narrative review of QoL concepts in rheumatic disorders (2) possible meanings and uses in rehabilitation are inferred and discussed. Their relationships with the concept of functioning according to the ICF are explicated. *Results:* In medicine, QoL has once been a term to express the need to move beyond mortality or symptom reduction as main outcomes in medical treatment. In rheumatic disorders there are early indications of the development of expert rated functional scales to appraise interventions. In psychiatry, role functioning has long been an important treatment outcome. Here, the QoL term is also used to describe the – often deprived – objective living situation of the affected person, as well as subjective evaluations of different life domains. In somatic medicine, the self-report of patients is often associated with the term QoL, usually in relation to functional assessments. Depending on the different concepts used, QoL can be part of a functional assessment (subjective report or appraisal of functioning), or functioning can be part of a much wider concept of QoL, encompassing health and functional domains as well as environmental and personal factors and life domains that go beyond the ICF model of functioning and disability. *Conclusion:* Contrary to the concept of functioning we do not have a unified understanding of QoL. Therefore, QoL should not be regarded as a scientific construct but as a field of interest that has to be distinguished into substantially different fields. Functioning itself can be regarded as one of the fields of QoL. There still has to evolve a common language for the different facets of QoL in order to be meaningful and useful in rehabilitation.

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### IL 23

### LIFE SATISFACTION AND DISABILITY

***Kerstin Fugl-Meyer, PhD***

*Department of Social Work, Karolinska University Hospital and Department of Neurobiology, Care Sciences and Society, Karolinska Institutet, Stockholm, Sweden*

The key assumption of this presentation is that at least from a Scandinavian perspective rehabilitation ultimately seeks to support patients towards a satisfying, meaningfully participating active life. My main messages are: *i*) At present quality of life (QoL) is not validly defined; *ii*) Different aspects of perceived goal achievement in life cannot meaningfully be aggregated into one simple score; *iii*) Life satisfaction appears reliably and validly measurable.

The term QoL lacks ontological basis. Moreover, health-related QoL-measurements and particularly health-related indices are

biased and often misinterpreted. One example is the SF-36 instrument; designed to measure subjective health status – not, as too often assumed, QoL.

I here intend to address the reliability and clinical validity of a generic checklist described by us (1). This instrument is by us regarded as an indicator of the degree to which an individual trusts that she or he can reach their vital (overall and domain-specific) goals. Low levels of satisfaction indicate aspirations/goal achievement gaps (2). In clinical practise we believe that such gaps should lead the rehabilitation staff to address the incongruence. Examples of the checklists' reliability and clinical validity in different rehabilitation clienteles will be given. Life-adaptation of disabled people is to a great extent dependent on their coping capacity and the support given by rehabilitation staffs. Whereas a rehabilitation process may lead to considerable increase in life satisfaction, it too often does not reach levels at par with physically unimpaired subjects'.

International comparisons of life satisfaction must recognise socio-demographic differences in populations' appreciation of their life-situation. Thus, even in the surroundings of the Baltic Sea distinct differences have been found (3): From a high in Denmark at 8.3 (10-graded scale) to 5.5–5.9 in the three Baltic states. This evidently should lead clinicians and researchers to use generic instruments encompassing control populations.

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## *REHABILITATION MEDICINE ACROSS SERVICES: COORDINATED REHAB STRATEGIES (IL 24, 25, 28, 29)*

### IL 24

### DEVELOPING CROSS-SECTIONAL REHABILITATION SERVICES – THE INTERNATIONAL PERSPECTIVE

***Gerold Stucki, MD, PhD; Christoph Gutenbrunner, MD, PhD***
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Abstract is missing.

### IL 25

### ISSUES OF REHABILITATION SYSTEMS IN BALTIC STATES

***Alvydas Juocevicius, MD, PhD[1]; Eva Soba, MD[2]; Aivars Vetra, MD, PhD***
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*Introduction:* Independent time from 1990 allowed a change in social and economical life of Baltic States and a model of multidisciplinary rehabilitation is already implemented. But still lack of outpatient PRM services can be recognized. *Aim:* To evaluate the process of implementation of multidisciplinary rehabilitation in Baltic States. *Methods:* A comparison and analysis was done of changes in the PRM services, structures, numbers of professionals, organization and management of multidisciplinary rehabilitation during a period of 20 years. *Results:* One of the key concerns of the Baltic State's societies is reintegration of disabled persons. Even from the beginning of developing modern rehabilitation, elements of the bio-psycho-social model were founded. Laws on reintegration of disabled persons were issued. Retraining of staff with support of colleagues from Western Europe, new training programmes for a new generation of specialists of multidisciplinary teams were started during the first decade of independent time. Development of inpatient and outpatient PRM services, as complex systems, was started step by step. Now PRM is part of mandatory health insurance and severe cases of persons with disabilities must have access and full reimbursement. Besides inpatient rehabilitation facilities there is a network of outpatient departments, but it is still insufficient. The inpatient and outpatient PRM services are run by PRM physicians with other specialists on call. The 31 PRM physicians from Baltic States have successfully graduated with the European certification, 4 PRM programs of care and 2 training centers are accredited by UEMS PRM Section & Board. PRM development trends in Baltic States are: to improve outpatient network and accessibility, to develop home rehabilitation services, to achieve better coordination between health and social sectors in providing comprehensive rehabilitation programmes. *Conclusions:* Even if a multidisciplinary rehabilitation model is implemented in Baltic States, further improvement is needed in accessibility of outpatient PRM services and in cooperation with social rehabilitation institutions.

### IL 26

See page 834.

### IL 27

See page 834.

### IL 28

### COMPREHENSIVE MANAGEMENT OF SPINAL CORD INJURY IN SWITZERLAND

***Hans Georg Koch, MD, PhD***
*Swiss Paraplegics Centre, CH-6022 Nottwil, Switzerland*

Switzerland has a unique system of lifelong support of Spinal Cord Injury (SCI) patients. Four major organisations share the different tasks of treatment and support and are, together with additional companies, united in the Swiss Paraplegic Group.

The first and most important task is fundraising. The Benefactors Association consists of more than 1.2 Mio members, mainly Swiss residents who each donate SFr 45 per year. It was founded in 1978 and promotes the activities of the Swiss Paraplegic Foundation. An incentive for members is a once-off payment of 200,000 SFr in the event of a member suffering paraplegia resulting from an accident.

The Swiss Paraplegic Foundation, established in 1975, is a solidarity network for people with spinal paralysis. Its work is based on the vision of medical care and holistic rehabilitation for people with paraplegia and tetraplegia, enabling them to live their lives as independently as possible. The Foundation undertakes and supports all measures which are deemed appropriate to achieve this target in accordance with the current state of science and technology. Every year more than 400 patients in Switzerland will find their way back to an active lifestyle in our society and reintegration to the workplace.

The Swiss Paraplegics Centre provides highly specialised medical treatment and care for spinal cord patients. The hospital was inaugurated in 1990 and is part of our network supporting spinal cord injured patients. The facility provides all needed services from initial spinal surgery, intensive care, comprehensive rehabilitation to vocational reorientation. The inpatient clinic consists of 140 beds and has provided 46,630 patient days to 883 persons in 2010.

At least once a year every Swiss patient is invited for a check-up to the outpatient department. This leads to continued contact with the patients over the years.

In regards to holistic rehabilitation and lifelong support, the Swiss Paraplegics Association plays an important role. It consists of various departments such as "Social and Legal Advice", "Life

Coaching", "Building without Obstacles", "Wheelchair Sports Switzerland" as well as "Culture and Leisure Activities". The Association is the umbrella group of 26 Wheelchair Sports Clubs spread throughout Switzerland and therefore keeps in contact with almost all wheelchair users in Switzerland.

The Swiss Paraplegic Research is the youngest member in the support chain of SCI patients. The interdisciplinary research in close collaboration with the other organisations is focused on the quality of life of SCI people in Switzerland. Research is performed in different areas such as social integration, health, self-determination and improvement of functionality. The aim is to comprehensively study the health and well-being of SCI persons by focusing on the everyday experiences of persons with limiting health conditions and their particular interaction with society.

The presentation will give an overview of the current state of lifelong management of Spinal Cord Injuries in Switzerland and also show today's planning for continuation and improvement of the system.

**IL 29**

### REHABILITATION ACROSS SECTORS IN SWEDEN

***Kristian Borg, MD, PhD***

*Division of Rehabilitation Medicine, Department of Clinical Sciences, Karolinska Institutet, Danderyds Hospital, Stockholm, Sweden*

Rehabilitation of patients with spinal cord injury includes acute, post acute and social and vocational rehabilitation. In Stockholm, Sweden, the different parts of the rehabilitation has been performed in separate units with their own financing. During the last decade a change with a financing of each patient for the whole rehabilitation period has been introduced. It has led to a more effective rehabilitation with shorter waiting between the units and a more individualized and adequate rehabilitation. Furthermore, this model is more cost-effective than the old one.

## *RESEARCH STRATEGIES IN PHYSICAL AND REHABILITATION MEDICINE (IL 30–32)*

**IL 30**

### WHY RCT'S ARE NOT ALWAYS THE BEST STUDY DESIGN?

***Henk Stam, MD, PhD***

Abstract is missing.

**IL 31**

### ALTERNATIVE DESIGNS IN CLINICAL RESEARCH IN PRM

***Hans Bussmann, PhD***

Abstract is missing.

**IL 32**

### QUALITATIVE METHODS IN REHABILITATION RESEARCH

***Ann Öhman, PT, PhD***

*Public Health and Clinical Medicine, Epidemiology and Global Health, Umeå University, Umeå, Sweden*

Qualitative methodology is quite rare in rehabilitation research, although there is a growing interest about the topic within the field. There is a need to assess rehabilitation implementations and their outcomes in ways that go beyond the traditional quantitative measurements. If qualitative methodology is integrated into the rehabilitation research toolkit, knowledge will increase on attitudes, perceptions and experiences of health care and rehabilitation. This will in turn help improve rehabilitation. In my presentation I will make an overview of the underlying scientific roots for qualitative methodology. Further, I will present the most commonly used qualitative methods within the field of rehabilitation and health research. Finally I will present examples of studies that have adopted qualitative approaches and discuss advantages and disadvantages with the methodology.

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## *EVIDENCE-BASED TREATMENT IN LONG-TERM PAIN (IL 33–36)*

**IL 33**

### EVIDENCE-BASED TREATMENT IN LONG-TERM PAIN – A SYSTEMATIC REVIEW OF CURRENT STATE OF SCIENCE – AN INTRODUCTION

***Jan Ekholm, MD, PhD, FRCP***

*Division of Rehabilitation Medicine, Karolinska Institutet, Department of Clinical Sciences, Danderyd University Hospital, Stockholm, Sweden*

In Sweden benefits and costs of various methods used in the health and medical service system are regularly analysed by a governmental authority: SBU (*Statens Beredning för Medicinsk Utvärdering* (in Swedish), (in English: The Swedish Council on Technology Assessment in Health Care). Scientifically based conclusions are compared with current practice in the country. The aim of its activities is to create a basis for decisions about which kinds of different health and medical care activities should be used or not used. The evaluations are published as books (in Swedish) and are followed by a summary and conclusions established by the board and council of this authority. A systematic literature review on methods for treatment of long-lasting pain was published by SBU in 2006 (1) and a follow-up with an up-date of new literature has recently been performed. The publication contains several sections, e.g. outcome measures in pain research, multimodal rehabilitation, psychological methods, pharmacological treatments, spinal cord stimulation, transcutaneous electric nerve stimulation, physical activity/exercise, relaxation, bio-feed-back, massage, acupuncture. The aim of the present symposium – supported by the Swedish non-profit Foundation for Rehabilitation Information/ Journal of Rehabilitation Medicine – is to report from the above work with the literature review.

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**IL 34–36**

### EVIDENCE-BASED TREATMENT IN LONG-TERM PAIN – A SYSTEMATIC REVIEW OF CURRENT STATE OF SCIENCE

***Pernilla Åsenlöf, RPT, PhD[1]; Britt-Marie Stålnacke, MD, PhD[2]; Anne Söderlund, RPT, PhD[3]***

*[1]Uppsala University, Uppsala, [2]Umeå University, Umeå, and [3]Mälardalen University, Västerås, Sweden*

*Background:* Pain is a common reason for seeking care. In Europe it is estimated that approximately 20% of the population have severe chronic pain. Chronic pain is also a significant cause of disability, for example in the form of various negative psychosocial consequences

and reduced participation in activities. In 2006, a report by Swedish Council on Health Technology Assessment (SBU) "Methods for the treatment of chronic pain" was published. Since that, further research have accumulated and SBU was engaged to conduct an update of the literature on rehabilitation of chronic pain. *Method:* The literature for the update had to meet the following main criteria: adults with pain lasting three months or longer, pain could be generalized or localized in neck/shoulder and low back. The main outcome measures were sick leave/return to work, pain intensity and disability. Follow-up would be at least three months after the treatment or that treatment had continued a long time (6–12 months). The literature search was made for years 2004–2009. *Results and conclusion:* The critical analyses of the included studies showed that there were some conclusions in the original report that were still valid after the update. These conclusions as well as the updated conclusions for multimodal rehabilitation and behavioural medicine treatment in the physiotherapy framework will be presented.

## *SPECIAL LECTURES (IL 37–41)*

### IL 37

### EUROPEAN CURRICULUM FOR SPORTS MEDICINE

***Guy Vanderstraeten, MD, PhD; Luc Vanden Bossche***

Abstract is missing.

### IL 41

### ACUTE AND EARLY POST ACUTE REHABILITATION IN STROKE

***Anthony Ward, MD, PhD***

Abstract is missing.

### IL 38

### MODERN ASSISTIVE TECHNOLOGY IN REHABILITATION

***Crt Marincek, MD, PhD; Mojca Jenko, PhD***
*University Rehabilitation Institute, Ljubljana, Slovenia*

Assistive Technology (AT) is defined as "any item, piece of equipment, or product system whether acquired commercially off the shelf, modified or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. It is a broad range of devices, services, strategies, and practices that are conceived and applied to ameliorate the problems faced by individuals who have disabilities. They range from low-tech aids, such as built-up handles on eating utensils, to high tech devices such as computerised communication systems, alternative access systems or powered wheelchairs. This definition emphasises the functional capabilities of individuals with disabilities as a result of the successful use of AT and takes a strong perspective on the outcomes in terms of quality of life. AT, classified by ICF as a contextual factor, can contribute to reduce disablement.

However, it will take time for the general public to become familiar with the ICF concept that "disablement" is a situation a person may encounter due to the gap between personal limitations and contextual factors, rather than an intrinsic characteristic of the person involved. Brain-computer interaction (BCI) is an emerging field that could contribute significantly to enhancing the accessibility of information communication technology (ICT) systems for the elderly and disabled. The field is driven by advances in non-invasive sensor and actuator concepts, smart bio-sensors as well as electronics miniaturization, wireless communication, advanced control and signal processing.

A BCI monitors the user's brain activity and translates their intentions into commands without activating any muscle or peripheral nerve. BCI as a proof-of-concept has already been demonstrated in several contexts; driving a robot or wheelchair operating prosthetic devices selecting letters from a virtual keyboard internet browsing navigating in virtual realities, and playing games.

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### IL 39

### TELEREHABILITATION: STATE OF THE ART

***Daniel Wever, MD; S. Kosterink; R. Huis in 't Veld; M. Vollenbroek; H. Hermens***
*The Netherlands*

Because of ageing and increase of chronic diseases health care will be unaffordable. Scenarios of the future in The Netherlands show an increase of chronic diseases with 25% in the period from 2010 to 2025 and 25% of the people will be older than 65 years. In the Netherlands 25% of the people have to work in health care. Many countries will follow this scenario.

Solutions can be find in information communication technology (ICT) supported home care. Possibilities are colleague consultation, patient consultation, monitoring health status and supervised training. Examples of these methods will be presented related to paediatric rehabilitation (TELEFYSIEK), patient consultation of patients with Amyotrophic Lateral Sclerosis (ALS), rehabilitation of neck complaints (MYOTEL) and especially supervised training of Low Back Pain (LBP) and pulmonary rehabilitation (CLEAR).

CLEAR (Clinical Leading Environment for the Assessment of Rehabilitation protocols in home care) is an implementation and research project subsidised by a fund of the European Union in Italy, Spain, Poland and The Netherlands. Preliminary results will be presented concerning supervised training of LBP patients and COPD patients in pulmonary rehabilitation.

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**IL 40**

## WHAT REDUCTIONS IN DEPENDENCY COSTS RESULT FROM TREATMENT IN AN INPATIENT NEUROLOGICAL REHABILITATION UNIT FOR PEOPLE WITH STROKE?

***Rory J. O'Connor, MD[1,2]; Rushdy Beden, MRCP[2]; Andrew Pilling, PhD[3]; M. Anne Chamberlain, FRCP[1]***

*[1]Rehabilitation Medicine, University of Leeds, [2]Leeds Teaching Hospitals Trust, [3]NHS Information Centre, Leeds, UK*

*Introduction:* In allocating healthcare resources in times of scarcity it is important to recognise the financial value of decreasing dependency. *Aims:* To determine: 1) the potential care costs in the community at the beginning and end of rehabilitation, 2) the overall savings per year which would thus accrue, 3) the total lifetime savings and 4) the length of time to offset the cost of rehabilitation. *Method:* Data from the casenotes of patients aged 16–65 years admitted with stroke (confirmed by MRI or CT) for multidisciplinary inpatient rehabilitation were abstracted onto a proforma. Only those patients with complete data who had completed at least 2 weeks in the unit were included. The Modified Barthel Index (BI), Northwick Park Dependency Scale and the Northwick Park Care Needs Assessment (NPDS) completed at admission, at midpoint and at discharge were used for calculations. The costs of inpatient treatment were taken from the hospital's reference costs. The sign test was used to compare ordinal variables (BI and NPDS) and the Wilcoxon signed ranks test to compare costs. *Results:* Of 51 patients admitted over one year 35 had full datasets. They had a median stay of 59 days; 29 were discharged home, 6 to a nursing home. Median BI increased from 50 on admission to 64 at discharge ($p < 0.001$). Median calculated potential cost of care in the community was reduced from £1,900 at entry to rehabilitation to £1,100 a week at discharge, a saving of £868 per week. For these 35 patients, this translates to total annualised costs reducing from £3,358,056 to £1,807,208. The payback time for rehabiliation costs was 21 weeks. *Conclusion:* Using available statistics the savings per year for a population of 100,000 would be some £200,000. Given that survival of these persons is now approximately 13 years this gives a lifetime saving of over £20 million for 35 patients (a lifetime saving of around €500,000 per patient). The study has limitations, such as sample size and the lack a control group, but the benefits of rehabilitation were found at all levels of disability.

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**IL 41**

See page 833.

**IL 26**

## DEVELOPMENT OF SOCIAL REHABILITATION SERVICES IN ESTONIA AND THE ROLE OF UEMS PRM SECTION CLINICAL AFFAIRS COMMITTEE AND EUROPEAN SOCIAL FUND IN THIS PROCESS

***Varje-Riin Tuulik, MD[1]; Dagmar Narusson, SW[2]***

*[1]AdeliSE Eesti, Tallinn, and [2]Pärnu College, University of Tartu, Estonia*

*Introduction.* In Estonia there are two different systems of rehabilitation management. The funding of the medical rehabilitation (PRM) comes from Estonian Health Insurance Fund and the funding for the social rehabilitation comes from Social Insurance Board. A lot of rehabilitation departments, even the hospitals, offer both medical and social rehabilitation. *Aim:* To evaluate current social rehabilitation system wich was started in 2000 when the Social Benefits for Disabled Persons Act was adopted. *Methods:* New social rehabilitation development projects were started with European Social Fund (ESF) funding in 2005. The first project was focused on improving the rehabilitation services and service quality, the second project focused more on the development of rehabilitation programs and the network between social service providers (local government social service units, Estonian Unemployment Insurance Fund, Social Insurance Board and social rehabilitation service providers etc.). *Results:* Following these projects Estonian rehabilitation developers started to emphasize the importance of implementing rehabilitation programs. A pilot project of rehabilitation programs was started in 2009. The aim of the pilot project was (1) to develop the standards for the rehabilitation programs in Estonia, (2) to map the target groups of rehabilitation services and (3) to implement a funding system for the programs. There were 16 different rehabilitation teams that develop and provide different rehabilitation programs in 2010–2011: an out-patient program for c/v patients; an out-patient Lokomat program for the neurological patients; an inpatient program for CP children and the psycho-social programs for mentally disabled children, psychiatric patients, disabled persons on an island, the young criminals; and a program for the adults with mental illness (SCH). A second ESF project period started in 2011 and 7 programs got funded, including programs for the blind and deaf people and special programs for the following conditions: SCI, eating problems, chronic pain, and autism. The rehabilitation program project is also an important alley for implementing assessment tools from WHO International Classification of Functioning, Disability and Health (ICF). Part of the rehabilitation program pilot project is testing the assessment instrument Disability Assessment Schedule WHO DAS. Estonia developed a new graduate level training program in Social Rehabilitation in 2009. The training curriculum consists of 8 modules and part of the training is to learn who to use the ICF methodology in the rehabilitation process. 422 rehabilitation specialists have finished the program and are competent in using the ICF. *Conclusions:* Estonian rehabilitation teams have made great progress using the ICF and the best European standards for rehabilitation programs.

**IL 27**

## REHABILITATION IN POLAND – HISTORY, CURRENT ISSUES AND PERSPECTIVES

***Marek Krasuski, MD, PhD[1,2]; Piotr Tederko, MD, PhD[1]; Jolanta Kujawa, MD, PhD[3]***

*[1]Rehabilitation Department, Medical University of Warsaw, [2]National Consultant in Medical Rehabilitation, and [3]Rehabilitation Department, Medical University of Lodz, Poland*

*Introduction:* Rehabilitation is a basic medical specialty. It is available since 1959 for physicians. Since 1983 the specialty is also available for physiotherapists. Recent status of our specialty results from the long-term application of a Polish Model of Rehabilitation accepted by WHO in 1970 as a model applicable for universal employment. The model corresponds to PRM programme as defined in the White Book of PRM, although it has been developed independently from European guidelines. *Aim:* The purpose of the paper is to present guidelines proposed in December 2010 by the National Consultant in Medical Rehabilitation on request of our Ministry of Health and insurance bodies. The guidelines define tasks, field of competence of medical rehabilitation specialists and other professionals at each stage of rehabilitation provided at hospitals, day-hospitals, outpatient services, and environmental settings. The guidelines describe principles of team work, planning of rehabilitation programmes, requirements concerning equipment and employment for centres providing rehabilitation service. Claims of other health professionals to broaden their field of competences, as well as a recent project of the Polish Ministry of Health to implement a system of licensed skills, in addition to already existing specializations, rise the question about practical application of the guidelines. *Conclusion:* Further development of the rehabilitation system in Poland may be affected by financial requests from insurers and changes in the education system. Constructive progress and functional improvement of the system require concordance between the health professionals, as well as experts' opinions to be accepted by decision-makers.

## ORAL FREE PRESENTATIONS

### *PAIN REHABILITATION (OP 43–49, 51)*

**OP 43**

### WITH AND WITHOUT CONCOMITANT DEPRESSION: DIFFERENCES IN PAIN, FUNCTIONING AND QUALITY OF LIFE BETWEEN WOMEN ON LONG-TERM SICK-LEAVE WITH MUSCULOSKELETAL PAIN

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*Introduction:* There are different views about how much, and in what way, comorbid depression influences functioning in patients with various somatic pain conditions. *Aim:* The aim was to describe the differences in pain, functioning and quality of life between women on long-term sick-leave due to protracted musculoskeletal pain with and without concomitant depression. *Methods:* A descriptive design was used and comparisons with/without comorbid depression. After having filled out questionnaires (e.g. SF-36, pain drawing, VAS scales, CPRS-SA, DSRS, SCID-II) 332 female patients were all examined by three specialist physicians in psychiatry (first investigation), orthopaedic surgery (2nd investigation) and rehabilitation medicine (final investigation). The patients were after investigations and consensus conference assigned to four groups according to the ICD-10 diagnoses found: low back/joint disorders (LBJ) ($n = 150$), myalgia (M) ($n = 43$), fibromyalgia (FM) ($n = 87$) or depression without somatic pain diagnose (DE) ($n = 52$). Non-parametric statistics (chi-square and Wilcoxon's rank sum test) were used for comparisons between and within groups. To control for false-positive results due to mass significans the Tukey-Kramer HSD correction was used. *Results:* Patients with somatic pain conditions LBJ, M or FM showed more activity-related difficulties if concomitant depression was present regarding the activities ICF-categories 'focusing attention', 'making decisions' and 'undertaking a single task'; and in the domains 'energy level', 'memory functions', 'emotional functions', 'optimism/pessimism', and 'confidence'. No differences in physically-related activities were noted between the somatic pain conditions with and without coexisting depression. Patients with concomitant depression perceived modestly higher pain intensity or at the same level. Patients with depression and LBJ or M reported slightly more spread pain than patients without depression. FM-patients with coexisting depression reported fewer painful sites on their pain drawings compared with FM-patients without depression. Patients with LBJ, M or FM and concomitant depression had lower quality of life in the dimension social function, but not in the dimension physical function. *Conclusion:* Women on long-term sick-leave with concomitant depression to long-lasting somatic pain conditions have more disabilities of a mental character as well as reduced quality of life in the dimension social function than patients without comorbid depression.

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**OP 44**

### NKT CELL, TH CELL AND IL-6 IN PATIENTS WITH FIBROMYALGIA SYNDROME

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*Background and aims:* Fibromyalgia syndrome (FMS) is a chronic widespread pain syndrome. The lack of information in pathomechanism of this syndrome makes physician difficult to give best treatments for these group of patients. Therefore it is important to further investigate it in order to develop successful management of FMS. Some studies regarding the role of cytokines in FMS still show discrepancies. In addition, immune cells which play role in many type of diseases may play role in symptom of FMS, too. Therefore further study to determine of cytokines and immune cells in FMS are of importance. Additionally, it is necessary to find correlation between these biomarkers and FMS symptoms. In this study, we observed and compare serum interlukin (IL)-6 and some immune cells from healthy subject (HS) and FMS patients and correlated them with FMS-symptoms. *Methods:* All procedures were carried out with written consent of the subjects as approved by local ethics committee (Nr. 5498). In this pilot study, 64 FMS patients who matched definition of ACR and 29 HS filled-out 10 cm-visual analog scales of pain and fatigue. In addition, they were asked filled out the Hospital Anxiety and Depression Scale (HADS) and Fibromyalgia impact questionnaire (FIQ). Serum IL-6 was measured by the ELISA method. Some immune cells from peripheral blood were evaluated by fluorescence-activated cell sorting (FACS) method. Statistics evaluation was done with SPSS 18. *Results:* Significant results show between group in pain ($p < 0.001$); fatigue ($p < 0.001$); anxiety ($p < 0.000$); depression ($p < 0.000$); serum IL-6 ($p < 0.005$) and Th cell (CD4+) ($p < 0.05$). Correlation was found between serum IL-6 and FIQ total ($p < 0.05$). Although there was no significant difference of NKT cell between groups, however our data showed correlation between NKT cell and anxiety and depression within FMS group. *Conclusion:* IL-6, Th cell (CD4+) and NKT cell seem to play a role in FMS-related symptom. These results can be suggested as one of possible pathomechanisms related to FMS symptoms.

**OP 45**

### VARIATION OF OUTCOME AMONG INPATIENT REHABILITATION CENTRES FOR PERSONS WITH CHRONIC BACK PAIN IN GERMANY

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*Introduction and aim:* In rehabilitation research little is known about service variation on outcome level and how differences between rehabilitation centres can best be explained. The present study is set up to describe the outcome variation among inpatient rehabilitation centres for persons with chronic back pain and try to explain differences by means of patient characteristics and interventions during rehabilitation. *Methods:* The study is based on an analysis

of quality assurance data of the German pension fund. It includes data on persons' characteristics, a patient questionnaire on success of rehabilitation in different domains sent to a random sample of all rehabilitation patients under the auspice of the German pension fund about six weeks after inpatient rehabilitation, and data on type and amount of interventions applied during rehabilitation based on a classification scheme mandatory for a subgroup of rehabilitation centres for documentation purposes. An outcome index was developed based on the ICF-domains to aggregate outcomes in different dimensions into a single index. Linear and logistic regression analyses as well as multi-level analyses were performed. *Results:* For the association of persons' characteristic and outcome data from 27,759 persons within 210 rehabilitation centres were available. Additional analysis of rehabilitation interventions were based on 14,075 cases. The range of persons with improvements in back pain ranged from below 20% and above 75% in different centres, or more than 1 standard deviation in the outcome index. This variation among centres could only partly be explained by persons' characteristics. Most important predictors for rehabilitation outcome were the number of work disability days and pension application before rehabilitation, also educational background and age. For rehabilitation interventions, a linear positive relationship between amount of exercise therapy and success was found. However, social interventions were negatively associated with rehabilitation success despite statistical control of persons' characteristics at baseline. *Conclusions:* Substantial variation of outcome between rehabilitation centres was found that could be explained by persons' characteristics (case mix adjustment) only partly. Differences in interventions could not explain differences in outcomes between centres. Important factors on the rehabilitation centre level that are responsible for the variation still have to be identified.

## OP 46

## DISSONANCE BETWEEN VISUAL AND PROPRIOCEPTIVE INFORMATION AS A MODERATOR IN EXPERIMENTAL PAIN

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*Introduction:* Movements during work with personal computers (PC) may lead to repetitive strain injury (RSI). Some etiological details of RSI are still unclear. Recent literature showed that incongruence between sensory and proprioceptive information (ISPI) may lead to changes in perception during movements (1). Because PCs produce ISPI, we proofed whether there is any relationship between visual delay (VD), movement and pain processing. Higher muscular co-activation (correlate of motor learning) between 50–100 ms VD (2) and sensitization while comparing aversive vs. non-aversive stimuli in 70 ms VD condition during keystrokes (3) were observable. *Aim:* The study aims to proof, whether the individual threshold of recognizing VD (IT) is a modulator of pain processing. *Methods:* Twenty-four subjects (mean age 25.8, SD 4.85) performed keystrokes on a keyboard in an electroshock (EC) and non-electroshock (NEC) trial. Every trial contained three VD conditions (20 ms, IT and 180 ms). Visual analogue scale (VAS) for pain and event-related electromyography (EMG) of extensor- and flexor-muscles in both arms was recorded. The arms were covered. Subjects saw their movements on a computer monitor. In EC the shock was given 200 ms after releasing the key. *Results:* There were only significant differences in the EMG with lower activity of the flexor ($p = 0.013$; Cohen's $d = 0.202$) and higher activity of the extensor ($p = 0.007$; Cohen's $d = 0.344$) during the EC compared to NEC in the IT condition. Only in the IT condition no differences in the VAS between EC and NEC were observable. *Conclusion:* The study shows that the IT condition lowered the skill to discriminate between EC and NEC and evoked motor learning/pain adaptation. Results are discussed regarding study design and implications for manual therapy.

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## OP 47

## CHRONIC WHIPLASH-ASSOCIATED DISORDERS IN LITHUANIAN PATIENTS FOLLOWING MOTOR VEHICLE COLLISION: AN UPDATE

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*Introduction:* In Lithuania, where the amount of traffic accidents is relatively high, the WAD diagnosis is uncommon (1996). *Aim:* To follow-up patients after motor vehicle accident in order to identify WAD symptoms as well as disability and to compare them with a control group. *Methods:* The study enrolled 19 men and 30 women (mean age $30.2 \pm 1.6$ years) who searched for medical help at the Emergency Room after motor vehicle collision. Pain intensity according to Visual Analogue Scale (VAS) and WAD symptoms according to Quebec Task Force questionnaire were examined 3–14 days and 6 months following the accident. Thirty-seven sex- and age-matched volunteers, with no previous history of a traffic accident, served as control. Disability Rate Index (DRI) and sociodemographic data was followed-up. *Results:* Forty-six of 49 patients developed acute WAD symptoms as compared to their pre-accidental symptoms. After 6 months, 23 of 46 patients still had WAD symptoms. In contrast, significant improvement was found in pain intensity and DRI ($p < 0.001$), but still, these rates remained higher than in the control group ($p < 0.05$). Compared to their preaccidental symptoms, chronic WAD patients had significantly more symptoms such as neck pain and reduced movements, dizziness, memory, concentration and visual impairment. However, in comparison with controls, differences were found in numbness of limbs, dizziness, memory and concentration impairment, that were more common in the WAD group, while the rate of low back pain was bigger in controls. Twenty-five patients were on sick-leave for an average of 26.4 (2.9) days following the collision. After 6 months, none of these patients lost ability to work due to health-related outcomes of accident. *Conclusions:* Our data indicate that Lithuanian patients do have chronic WAD symptoms, but only few were more common than in controls. However, these residual symptoms do not influence ability to work.

## OP 48

## MAGNETS IN PAIN THERAPY – ANALYSIS OF EVIDENCE

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*Introduction:* Contemporary PRM is a dynamically developing discipline and sometimes becomes a field of economical and commercial competition. New emerging modalities, frequently born from alternative medicine compete with evidence-based methods. Application of static magnetic fields (SMF) gains advertised as a safe and effective pain therapy for universal home use with no necessity of physicians's consultation. *Aim:* To analyze scientific evidence of efficacy and safety of SMF devices against pain. *Methods:* In peer-reviewed journals we identified 45 papers in-

cluding 40 primary publications and 5 metaanalyses. Five original studies were excluded as uncontrolled or case studies. One was disqualified because of simultaneous application of alternating magnetic field. *Results:* Among 34 randomized controlled trials on clinical applications of SMF in the therapy of pain 10 support the hypothesis of analgesic effect of SMF, 8 neither confirm nor exclude therapeutic efficacy of SMF, and 16 give the evidence against SMF superiority over placebo. Failure to blind the study, low numerical force, short follow-up period frequently limit the value of evidence of the analyzed papers. Expectations resulting from sponsorship of studies by manufacturers of SMF equipment appear to influence objectivity of several studies. SMF of inductances within the range of those used in analyzed devices are not classifiable as to their potential risk of chronic exposition by inconclusive evidence. According to theoretical deliberations pregnancy, infancy, pacemakers, ferromagnetic implants and application of electronic devices regulating life functions are considered contraindications for the use of therapeutic devices emitting SMF. *Conclusions:* Recent state of knowledge does not allow for unambiguous confirmation of SMF therapeutic efficacy. Devices for SMF application should not be sold as analgesic modalities before evidence of efficacy and safety in each particular indication appears.

**OP 49**

### EFFECT OF PHYSICAL REHABILITATION PROGRAM ON INDICES OF BIOGEOMETRICAL PROFILE OF THE POSTURE IN PATIENTS WITH OSTEOCHONDROSIS AFTER MICRODISCECTOMY IN THE LUMBAR SPINE

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*Introduction:* The author examines the situation with influence of the physical rehabilitation program on the formation of a normal static and dynamic stereotype in patients with osteochondrosis after microdiscectomy in the lumbar spine. The proposed program, developed in accordance with the recommendations of surgeons on the conduct of the postoperative period include: a modified therapeutic exercise, aimed at creating proper postural synergies that a correct dynamic stereotype by the procedure of Nekrasov, therapeutic massage, and some kinds of muscle relaxation with local or through generalized trigger points, the dynamic electrical stimulation with biofeedback. *Objective:* To improve the effectiveness of recovery through an improved physiologically based physical rehabilitation program for patients with osteochondrosis and reflex scoliosis following minimally invasive surgeries on the spine. *Method:* Computer photometry. *Results:* Deformation of the spine in the frontal plane was confirmed by the results of the biogeometrical profile of patients with osteochondrosis and reflex scoliosis. Indices of the angle β2 characterized by a symmetric shoulder girdle. It were increased by 78%, and the angle β4, which was characterized by the symmetry of the pelvic bones by 116%. When analyzing the performance of the radial distance between the point and the center of the iliac crest on the left and right also revealed significant differences between the values on the side of concavity and convexity of the scoliosis ($p < 0.05$). The influence of a developed and integrated physical rehabilitation program for patients with osteochondrosis and reflex lumbar scoliosis and operated, using minimally invasive techniques in the main group reported positive quantitative changes in the biogeometrical posture profile, compared with patients involved in the conventional program ($p < 0.05$). Statistically significant changes ($p < 0.05$) were indicated in the angles β4 (characterizing the symmetry of the pelvic bones) and β2 (characterizing the symmetry of the shoulder girdle). *Conclusion:* For patients after microdiscectomy, a postoperative care including a developed program of physical rehabilitation may be preferred.

**OP 51**

### NEUROPATHIC PAIN: DRUGS AND PHYSICAL ANALGESIA

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*Introduction:* We present some contemporary theories of pain and therapeutic concepts of analgesia, including drug and physical analgesia. We mention different natural and preformed physical modalities, with effectiveness in clinical practice. *Aim:* A comparative evaluation between the efficacy of pure drug therapy and combined (drug and physical) analgesia on neuropathic pain. *Methods:* During the last years a total of 99 patients with a vertebrogenic radiculopathy were observed and investigated (in- and out-patients). Patients were randomized to three treatment groups of 33 each one. The investigation was conducted in accordance to laws for protection of patients, as outlined in the Helsinki Declaration, and was approved by the appropriate institutional review boards and ethics commissions. All patients gave written informed consent before undergoing any examination or study procedure. All patients received drug therapy: paravertebral infiltrations with corticosteroids, B-vitamins, local anesthetic, and collagen. Group 1 received only drug therapy. Patients of groups 2 and 3 received drug therapy and physical modalities (complex rehabilitation programme including Nivalin iontophoresis, electrostimulations, exercises, soft tissue techniques, sea lye compresses distally): in group 2 we began the physical analgesia techniques in parallell with drug therapy; in group 3 we applied the physical analgesia techniques 2 weeks after the initiation of the drug therapy. For statistical evaluation we used *t*-test (ANOVA) and Wilcoxon rank test (non parametrical correlation analysis), using a SPSS package. The treatment difference was considered to be statistically significant if $p < 0.05$. *Results:* The comparative analysis showed a significant improvement of patients' complaints, signs and symptoms, concerning pain relief (visualized by the analysis of results of Visual analogue scale), radiculopathy (Lasegue's sign), depression (scale of Zung). We observed the best results in group 2. We expose our own conception of pathogenetical mechanisms of physical analgesia. *Conclusion:* The pure drug therapy is efficient but with short duration. Best efficacy was observed in case of parallel combination of medication with physical modalities – in the beginning due to drugs, toward the moment of effective "input" of physical modalities. We may recommend our rehabilitation strategy for complex treatment of the neuropathic pain.

## *PHYSICAL ACTIVITY AND EXERCISE IN REHABILITATION (OP 52–58)*

**OP 52**

### WHAT IS THE LONG-TERM BENEFIT OF PROGRESSIVE RESISTANCE TRAINING AFTER STROKE? A 4-YEAR FOLLOW-UP

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*Introduction:* Leg muscle weakness is a common impairment after stroke and is closely associated with reduced walking ability. This can have an adverse effect on the possibility to be physically active. One form of training that has gained increased interest in stroke rehabilitation is progressive resistance training (PRT). In a randomized controlled trial (RCT) ($n = 24$), we have shown that ten weeks of PRT (80% of 1 repetition maximum, RM, twice a week) of the lower

limbs after mild to moderate stroke is an effective form of training to improve knee muscle strength and gait performance without any negative effects on muscle tone. Our knowledge of the long-term effects of PRT in chronic stroke is, however, not known. *Aim:* The aim of this study was to evaluate the long-term effects of PRT on muscle function, gait performance, and perceived participation in individuals with mild to moderate stroke. *Methods:* Eighteen of the 24 individuals (5 women and 13 men; mean age 66 ± 4 years) that participated in the original RCT was assessed 4 years after completion of the PRT. The training group had participated in supervised progressive resistance training of the knee flexors and extensors (80% of 1RM) twice weekly for 10 weeks, whereas the control group had continued their usual daily activities. Muscle strength was evaluated isotonically and isokinetically (60°/s), muscle tone by the Modified Ashworth Scale, gait performance by Timed "Up & Go", Fast Gait Speed and 6-Minute Walk and perceived participation by the Stroke Impact Scale. *Results:* At the 4-year follow-up and compared to baseline, both groups had maintained their knee muscle strength and gait performance. There were, still, significant between-group differences in both isotonic ($p < 0.01$) and isokinetic ($p < 0.05$) muscle strength measurements in favour of the training group. No significant between-group differences were found in muscle tone, gait performance or perceived participation. *Conclusion:* The results indicate that there is a long-term benefit of PRT in chronic stroke. Thus, PRT is an effective training method to improve and maintain muscle strength in chronic stroke in a long-term perspective, which further supports its inclusion in stroke rehabilitation programmes.

## OP 53

## EFFECTS OF RESISTANCE TRAINING IN COMBINATION WITH IVIG TREATMENT IN PATIENTS WITH POST-POLIO

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*Introduction:* Several studies have shown that muscle resistance training in post-polio patients (PPS) increases strength and/or performance. Thus, muscle training and physical activity is the basis for rehabilitation of PPS patients. Intravenous immunglobulin treatment (IVIG) leads to increased muscle strength, physical activity and also an increased quality of life regarding vitality and general health. One may speculate that there are different mechanisms behind the clinical effects of the treatment with IVIG and the effects of muscular resistance training. *Aim:* To evaluate the effects of muscular resistance training for PPS patients who receive treatment with IVIG on muscle strength, functional ability, health-related quality of life, pain and gait variables. *Methods:* The study is a clinical open prospective study with a randomisation of IVIG treated PPS patients to either muscular resistance training or to continue with "business as usual". The patients included, with clinically and neurophysiologically verified diagnosis of PPS, were referred for IVIG treatment and were able to walk for 6 min. The training programme was modified from a programme which earlier has shown a significant increase of muscle strength in PPS patients (Skough et al; 2008). Resistance training was performed with a physiotherapist 30–60 min per day, three days a week during 12 weeks. All patients were evaluated before the treatment and after the 12 weeks with: 6-min walk test, timed up & go test (TUG), muscle strength of the knee extensors and flexors measured with dynamic dynamometer (KinCom) and questionnaires Short-Form SF-36, EQ5D, The Physical Activity Scale for the Elderly (PASE), The Multidimensional Fatigue Inventory (MFI-20) and pain measured with Visual Analogue Scale (VAS). *Results and discussion:* Seventeen patients participated. 6-min walk test showed an increase in walk length of 26 m for all. There was a better result for the training group than for the control group regarding muscle strength in knee extensors (involved leg). There was a statistically significant improvement for the training group regarding General Health (SF36) and for General Fatique (MFI-20) compared to the control group.

## OP 54

## EFFECT OF AEROBIC TRAINING ON EXERCISE CAPACITY IN PATIENTS WITH HEART FAILURE ON EARLY REHABILITATION FOLLOWING ACUTE MYOCARDIAL INFARCTION

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*Introduction:* Decreased exercise capacity is the main factor restricting the daily life of patients with heart failure (HF). Aerobic training improves exercise intolerance and quality of life (QL) in patients with HF following acute myocardial infarction (MI) with reduced ejection fraction (LVEF). *Aim:* To evaluate the effect of aerobic training on exercise capacity in early rehabilitation after acute MI in patients with HF, improved coronary perfusion and low LVEF. *Methods:* Fifty-five patients with HF following acute MI were included into the study; mean age 65 ± 10 year; LVEF <40%. All patients were applied aerobic training programme for 2 weeks using a bicycle ergometer at a load corresponding to 50–70% of their oxygen consumption $(VO_2)_{peak}$ and standard medicament therapy. The effect of the aerobic training was assessed following patient exercise capacity parameters changes, estimated during spiroveloergometry: exercise capacity (W) and oxygen consumption ($VO_2$ (%) corresponding $VO_{2peak}$) at anaerobic threshold (AT); $VO_{2peak}$; peak exercise capacity (W, MET). *Results:* At the end of rehabilitation there was a significant increase in patient exercise capacity (W) and oxygen consumption ($VO_2$ (%) corresponding $VO_{2peak}$) at individual Wasserman's AT ($p < 0.01$). In addition there was significant improvement of patients peak oxygen consumption ($VO_{2peak}$) ($p < 0.05$) and peak exercise capasity (W, MET) ($p < 0.05$). *Conclusions:* Aerobic training in early rehabilitation significantly improves exercise capacity tolerance at individual Wasserman's AT; as well as in peak oxygen consumption ($VO_{2peak}$) and in peak exercise capacity (W; MET).

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## OP 55

## ISOKINETIC KNEE EXTENSION AND FLEXION STRENGTH IN INDIVIDUALS WITH HEMIPARESIS AFTER STROKE

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*Introduction:* Muscle weakness in the lower limbs is one of the major impairments after stroke. The primary contributor to this weakness is the loss of voluntary activation from the central nervous system. However, muscles can also undergo changes in mechanical properties

in the muscles and other soft tissues either as a result of the stroke itself or from disuse following the stroke. Training of muscle function, in particular progressive resistance training (PRT), is a major component in stroke rehabilitation. To be able to plan appropriate interventions aiming at improving muscle strength, an in-depth understanding of the differences in strength between sides, muscle actions, speeds and modes is needed. *Aim:* The aim of this study was to assess knee extensor and flexor muscle strength in individuals with hemiparesis after stroke and determine the relationship with muscle tone. *Methods:* Fifty individuals (mean age 58 ± 6.4 years), 6 to 48 months after stroke, participated in the study. Maximal isokinetic concentric knee extension and flexion strength at 60º/s and 120º/s and maximal isokinetic eccentric knee extension contractions at 60º/s were measured with a Biodex dynamometer. Muscle tone was assessed with the Modified Ashworth Scale. *Results:* The relative weakness in the paretic knee muscles ranged from 32% to 44% and was greater for the flexors and at higher velocities ($p < 0.05$). The knee flexion/extension strength ratio in the non-paretic lower limb was 0.55 for both velocities and ranged from 0.41 to 0.48 in the paretic lower limb. The eccentric/concentric ratio in the paretic lower limb was significantly ($p < 0.05$) higher than in the non-paretic lower limb (1.73 vs 1.36). Concentric strength in the paretic lower limb correlated significantly ($p < 0.05$) with muscle tone. *Conclusion:* Post-stroke weakness of the knee muscles was most prominent in the flexors and at higher velocities, whereas eccentric strength seemed to be preserved. Strength was also associated with the spasticity that can occur after stroke, but very few individuals had an increased tone which limits the significance of this finding. This post-stroke muscle weakness pattern could be of importance for gait performance and should therefore be accommodated when planning interventions.

## OP 56

## BRAIN NATRIURETIC PEPTIDE IN HEART FAILURE PATIENTS FOLLOWING ACUTE MYOCARDIAL INFARCTION: RELATIONSHIP WITH EXERCISE TOLERANCE AND CARDIAC WORK IN EARLY REHABILITATION

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*Introduction:* Brain natriuretic peptide (BNP) is a secreted peptide by the atria and ventricles in response to parietal distension. It is proposed as a screening test for heart failure (HF) patients to assess their exercise tolerance. *Aim:* To evaluate relationship of BNP level to physical work capacity and left ventricular ejection fraction (LVEF) of heart failure patients following acute myocardial infarction (MI) in early rehabilitation. *Materials and methods:* BNP were assayed in 74 patients after acute MI, mean age 64.5 ± 12 years, with HF due to left ventricular systolic dysfunction (LVEF 35.11 ± 4.84%). All subjects were stable on optimal medical therapy. All of them underwent 3 weeks in-patient rehabilitation which was introduced approximately 10 days from the very beginning of MI. All patient were applied the individual exercise training (according to the data of exercise tolerance). Subjects underwent a symptom-limited graded maximal exercise test with respiratory gas analysis while $VO_2$, heart rate (HR), and blood pressure (BP) were monitored. Correlation analyses were conducted to assess the relationship of BNP level to $VO_{2peak}$, peak exercise capacity (MET, W) and LVEF in HF patients following acute MI. *Results:* BNP levels were significantly correlated with physical work capacity levels: with $VO_{2peak}$ ($r = –0.496$, $p = 0.06$), with MET ($r = –0.427$, $p = 0.021$), and with W ($r = –0.583$, $p = 0.01$). Whereas were not the relationship between plasma BNP levels and left ventricular ejection fraction ($r = –0.04$, $p = 0.33$). *Discussion:* The results of this study suggest that plasma BNP level may be a useful clinical measure for evaluating functional capacity in individuals with heart failure following acute MI during early rehabilitation. *Conclusions:* 1) In patients with heart failure following acute MI, plasma BNP level significantly correlates with physical work capacity parameters (both $VO_{2peak}$, MET, W) during early rehabilitation. 2) These findings may support the use of BNP as a marker of heart failure severity following acute MI in early rehabilitation period.

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## OP 57

## INTERVAL HYPOXIC TRAINING AS AN EFFICIENT MEANS IN THE COMPLEX OF THERAPEUTIC MEASURES IN JUVENILE UTERINE DYSFUNCTIONAL BLEEDINGS

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*Introduction:* Juvenile dysfunctional uterine bleedings (JDUB) make 10% of menstrual function disturbances in girls of pubertal age (3). Women's childbearing function depends in many respects upon the character of puberty: 28.2% of women with JDUB in the reproductive age suffer from menstrual dysfunctions, 35.5% of women are primary (hormonally) sterile, 35% have abortions (4). Girls born by mothers with the disturbed reproductive system often have physical development disorders. *Aim:* The aim of this work is to describe the effect of applying IHT for the treatment of JDUB patients. *Methods:* Thirty-five girls aged 12–15 years suffering from the JDUB received the course of IHT. The auxiliary diagnostics tests (measurement of basal temperature, analysis of the vaginal smears for determining the estrogen saturation, etc.) revealed anovular cycles. Under the conditions of basal metabolism and relative rest the measurements of respiratory minute volume (VE), frequency of breathing (f), $O_2$ and $CO_2$ concentrations in the expired air (with the use of gas analyzer, GA-O[4]), heart rate (HR), arterial oxygen saturation ($SaO_2$) (using the "Oxyshuttle" device) were performed. The same values were recorded during the hypoxic test at the 3rd and 8th minutes of HM-13 inhalation. HR and $SaO_2$ were recorded continuously. *Results:* In the patients of the basic-group, Hb increased from 109.7 ± 0.8 g*I$^{-1}$ to 144.5 ± 0.5 g*I$^{-1}$ and RBC increased from 3.401 ± 0.190 $10^6$*mm-3 to 4.116 ± 0.260 $10^6$*mm$^3$ ($p < 0.05$). In patients of the control group, Hb was 107.4 ± 0,9 g*I$^{-1}$ before the treatment and 137.4 ± 0,6 g*I$^{-1}$ after the treatment. Thus the increment of Hb was 34.8 g*I$^{-1}$ in the IHT group and it was significantly smaller in the control group – 22.0 g*I$^{-1}$ ($p < 0.05$). The increment of RBC was as significantly greater in patients after the IHT course. Breathing of patients with JDUB was more frequent and shallow. The tidal volume (VT) was 250 ± I$^3$ ml and the minute volume of breathing (VE) was 4.900 ± 0.380 l*min$^{-1}$ while in the norm, the VT comprises 3I5±22 ml and the VB – 5.650 ± 0.196 l*min$^{-1}$. In patients with JUUB of control and basic groups, the cardiac output (Q) was higher than the age-related norm (4.434 ± 14.5 l*min$^{-1}$). Such volumes rate of blood flow was due to the higher heart rate (75.2 ± 1.99 beats*min$^{-1}$) and at blood with Hb < 70 g*I$^{-1}$ 85.0 ± 3.2 beats*min$^{-1}$. *Conclusion:* The therapeutic effect of IHT on patients with JDUB depends both on the generalized effect of low pI02 and on its specific action on the hypothalamo-hyphophysis-ovarian system (4). The generalized

organismic response to low pI02 ensures the increased rate of oxygen step-by-step delivery and oxygen utilization in tissues (1, 2, 5).

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**OP 58**

## EFFECTIVENESS OF SUPERVISED PHYSICAL ACTIVITY PROGRAM IN PATIENTS WITH TYPE II DIABETES MELLITUS

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*Background:* Type 2 diabetes is a chronic, metabolic disease characterized by hyperglycaemia resulting from insulin resistance (1). It is clinically important in the prevention of type 2 diabetes-related complications to regulate blood glucose levels, body mass index, waist and hip circumference, and physical activity level. The findings of previous research studies provide supportive evidence for the use of supervised exercise programs to improve exercise capacity (2) in people with type 2 diabetes. *Aim:* To determine the impact of a supervised physical activity program on blood glucose level, anthropometric indicators, and physical activity level in patients with type 2 diabetes mellitus. *Methods:* Twenty-eight members (75% women, 25% men) of the Lithuanian Diabetes Association with type 2 diabetes (mean age 64.93 ± 5.54 years) participated in the clinical trial. Inclusion criteria: type 2 diabetes and consent to participate in the trial. Exclusion criteria: sharp changes in blood glucose level, high blood pressure, eyes and kidneys damage, acetone in urine. The intervention consisted of 9 supervised physiotherapy sessions. Duration of the supervised physiotherapy program was four weeks. Physical exercises (isometric, dynamic) were applied twice a week with a duration of 40 min. Blood glucose level was evaluated before and after each physiotherapy session. Waist and hip circumferences, waist and hip ratio, BMI, and physical activity level according to International Physical Activity Questionnaire were assessed twice: before and after the physiotherapy program. Mathematical statistics was done using SPSS package. We calculated means and SD of all evaluated indicators. Comparisons between all indicators before and after applying physiotherapy were made using Student *t*-test at a level of significance of $\alpha = 0.05$. *Results:* Blood glucose level had the tendency to decrease during all physiotherapy sessions and significantly decreased ($p < 0.05$) after applying the supervised physiotherapy program. Body mass index decreased, but not significantly. Waist circumference decreased significantly in the diabetes patients, but hip circumference and waist–hip ratio not significantly. Physical activity level of patients increased statistically significant after applying supervised physical activity program. The lack of comparison group is a limitation of the study. *Conclusions:* After the supervised physical activity program there were decrease in blood glucose level ($p < 0.05$), waist ($p < 0.05$) and hip ($p > 0.05$) circumferences, waist–hip ratio ($p > 0.05$), and increase in physical activity level ($p < 0.05$) in patients with type 2 diabetes mellitus.

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## *USE OF ICF IN REHABILITATION (OP 59–64)*

**OP 59**

## FEASIBILITY OF USING AN ICF-BASED ACTIVITY OF DAILY LIFE OUTCOME MEASURE

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*Introduction:* The International Classification of Function, Disability and Health (ICF) has been promoted for use in clinical practice but few articles have demonstrated that it can be used as a sensitive outcome measure. As assessment of activities of daily living is one of the most common assessments performed in rehabilitation we developed an ICF-based activity of daily life (ADL) outcome measure. *Aim:* The aim of this study is to evaluate the feasibility of an ICF-based ADL outcome measure in detecting meaningful changes of function in persons who are admitted to a general rehabilitation unit for inpatient rehabilitation following stroke or orthopaedic or other conditions. *Methods:* Fifty-six consecutive patients admitted from 1st March 2011, were rated on the ICF-based outcome measure on admission and on discharge from the rehabilitation ward. The medium scores for each item at each observation point were calculated and the Wilcoxon Signed rank test was used to determine statistically significant differences between scores. *Results:* We could demonstrate a significant functional change in 11 of the 19 ADL items and a change in median ADL ICF score in 7 of the 19 items. In particuler the self care items and the mobility items demonstrated changes during the rehablitation admission. *Conclusions:* While our study suggests that our ICF ADL outcome measure has the potential to be used as an outcome instrument as it appears to have sensitivity as a measure of changes in patients during a rehabilitation admisssion, further work is required to validate it as an outcome measure and demonstrate other components of validity.

**OP 60**

## USEFULNESS OF INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) FOR PATIENTS AFTER STROKE

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*Introduction:* ICF can be used to measure problems in functioning and activities/participation, their changes during rehabilitation. ICF core set give opportunity to perform complex and well organized evaluation. *Aim:* To evaluate usefulness and advantages of ICF as tool for measurement of rehabilitation effectiveness. *Methods:* 110 patients after stroke participated in this research. Evaluation of patient was performed during observation and from medical documentation. Additionally other functional independence test (FIT) and Barthel index were performed to evaluate independence level in everyday activities. Additional cognitive functions evaluation was performed with Mini-Mental state examination (MMSE). *Results:* During rehabilitation improvements in body functions and activities/participation components were detected ($p < 0.01$). Significant differences in improvement were found between II and III level rehabilitation patients, except communication functions (b3), domestic life (d6) and interpersonal interactions and relationships (d7). Rehabilitation effectiveness was similar for both sexes, no statistically significant changes were found neither in body functions, nor activity and participation components. ICF equivalents for both

functional independence tests were found. Strong correlation was detected between results of Barthel index and another FIT and their ICF equivalents. Very strong correlation was found between both independence measures and their equivalents. Moderate correlation was found between MMSE and its ICF equivalent. *Conclusions:* ICF gives opportunity to evaluate rehabilitation effectiveness because it reflects changes in body functions and activities/participation. Strong and moderate correlations were found between Barthel index, FIT, MMSE and their ICF equivalents. This makes it possible to use ICF instead of these tests.

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**OP 61**

## USING THE ICF BRIEF CORE SET FOR STROKE AS AN OUTCOME MEASURE IN THE REHABILITATION DAY HOSPITAL SETTING

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*Introduction.* A number of outcome measures in stroke rehabilitation are not useful in the day hospital setting because of ceiling effects, or a lack of sensitivity in this setting. We introduced the ICF Brief Core Set as an outcome measure for stroke patients in the day hospital setting and analysed it to see if it is sensitive to changes in this setting. *Aim:* The objective of the study is to determine if the ICF Brief Core Set for stroke patients is sensitive to changes in an Australian rehabilitation day hospital setting and describe its usefulness. *Methods:* This is a prospective study on patients who suffered cerebrovascular accident and required treatment in the day hospital setting after discharge from inpatient rehabilitation. The ICF Brief Core Set for stroke was administered to patients on admission to the rehabilitation day hospital and again about 6 months after commencement of day hospital treatment or on discharge from the day hospital. The assessment was based on physical examination, direct observation and interviewing patient, family, and staff involved in direct patient care. Nineteen patients with mild to moderate stroke severity were included in this study. *Results:* On the Wilcoxon Signed ranks test 11 of the 18 items were significantly different and on the Sign test 8 of the 18 items were significantly different on the two scores. The items that showed significant improvement included items from the domains of 4 of the 6 body function items, and 6 of the 7 participation and activity items. The other body function and activities and participation items approached significance. In 2 of the 3 environmental items, as well as the 2 body structure items there was no change in the score. *Conclusion:* It was expected that there would not be a change in the body structure items and the environmental items. The significant changes in the function and activities and participation items even in such a small sample suggest that the ICF Brief Core Set is a useful outcome measurement in the Australian rehabilitation day hospital setting.

**OP 62**

## APPLICATION OF ICF FOR PATIENTS AFTER STROKE

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*Introduction:* After 2001 the main rehabilitation model became biopsychosocial, as it is reflected in International classification of functioning, disability and health (ICF). ICF can be used to identify problems in functioning and activities/participation, their changes during rehabilitation. *Aim:* To evaluate application of ICF as tool to detect rehabilitation effectiveness for patients after stroke. *Methods:* 110 patients after stroke participated in this research. They were evaluated twice. Evaluation of patient was performed during observation and some information was gathered from medical documentation. *Results:* First evaluation revealed that most frequent dysfunctions are: sleep (79.1%), memory (78.2%), blood pressure (80%), exercise tolerance (94.5%), muscle power functions (97.3% (arm)) and (96.4% (leg)), involuntary movement reaction (82.7%), control of voluntary movement (93.6%), gait pattern (74.5%). During rehabilitation the most significant changes of functions were: orientation, higher-level cognitive, mental functions of language, voice, articulation, fluency and rhythm of speech, ingestion, proprioceptive, touch, sensory functions related to temperature and other stimuli, blood pressure, exercise tolerance, muscle power functions (leg), muscle endurance. After arrival patients had problems in these activities/participations: solving problems (75.5%), handling stress and other psychological demands (70%), conversation (78.2%), transferring oneself (75.5%), lifting and carrying objects (88.2%), fine hand use (90.9%), hand and arm use (88.2%), walking (97.3%), moving around in different locations (99.1%), washing oneself (99.1%), caring for body parts (89.1%), toileting (88.2%), dressing (90.9%), eating (74.5%), acquisition of goods and services (98.2%), preparing meals (98.2%), doing housework (86.4%). *Conclusions:* Information gathered by applying an ICF core set allow to get detailed well organized information about people after stroke – body functions and activities/participation – and their changes during the rehabilitation process.

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**OP 63**

## FEASIBILITY OF USING A CHECKLIST BASED ON THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH AS AN OUTCOME MEASURE IN INDIVIDUALS FOLLOWING LOWER LIMB AMPUTATION

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*Introduction:* The International Classification of Function, Disability and Health (ICF) has been promoted for use in clinical practice but few articles have demonstrated that it can be used as a sensitive outcome measure, and there has been no published evidence that it can be used for individuals following a lower limb amputation. We developed an ICF-based checklist which included 25 items for individuals who had an amputation. *Aim:* The aim of this study is to evaluate the feasibility of this checklist in detecting meaningful changes of function and quality of life in persons following a lower limb amputation using the ICF qualifiers as an outcome measure. *Methods:* Twenty patients were rated on the ICF check list items at four time points; preadmission status, one week post amputation, on discharge from the acute hospital and three months post amputation. The medium scores for each item at each observation point were calculated and the Wilcoxon Signed rank test was used to determine statistically significant differences between scores. *Results:* Seventeen patients completed the full study, having data collected at each of the four time points. Using the ICF checklist, we could demonstrate a significant functional deterioration immediately

after amputation with a gradual improvement in function over the following three weeks consistent with our direct observations of these patients. *Conclusions:* The ICF checklist has the potential to be used as an outcome instrument as it appears to have content validity and sensitivity as a measure of changes in patients following an amputation but further work is required to validate it as an outcome measure.

**OP 64**

## PATIENT CLASSIFICATION AS A NEW RESEARCH STRATEGY IN MEDICAL REHABILITATION. RESULTS OF THE DEVELOPMENT OF REHABILITEE-MANAGEMENT-CATEGORIES (RMK) – A DEMAND- AND PERFORMANCE-RELATED PATIENT CLASSIFICATION IN MEDICAL REHABILITATION IN GERMANY

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*Introduction:* Unlike the acute care setting, in which diagnosis-related groups (DRG) have already been introduced in 1996, medical rehabilitation is still differently reimbursed in Germany. The costs of a rehabilitation are based on the daily reimbursement rate and the treatment duration. Therefore differences in treatment needs are not sufficiently considered when it comes down to reimbursement. *Aim:* In contrast to the DRG, a cost-based patient classification system, the concept of Rehabilitee-Management-Categories (RMK) was developed to classify rehabilitees primary by their relevant impairment of activity and participation, as these factors mainly determine the treatment nee§ ds and resources required in rehabilitation. In the course of the development process a statistical modelling of empirical data was performed followed by a clinical validation to ensure that evidence-based knowledge and criteria which are relevant for daily practice were taken into account. Results are reported exemplarily for orthopaedic rehabilitation, especially for patients with chronic back pain. *Methods:* A RMK-assessment that allows the assessment of rehabilitation treatment needs according to a bio-psycho-social model was developed by utilising internationally established assessments (i. e. SF-36, PDI, HADS). Data was obtained in two independent samples of 1,200 patients with low back pain undergoing orthopaedic rehabilitation in 2004/05 and 2006/07. Latent class analyses were applied to find groups of cases. To facilitate the patient classification a software-based algorithm was developed and implemented in 8 rehabilitation centres. Standardised and qualitative user surveys were conducted by the end of the study. *Results:* On the basis of 11 needs-related patient characteristics four case groups "chronic back pain" were identified that differed significantly in their bio-psycho-social impairment. The user survey confirmed the clinical plausibility of the four different case groups as well as the feasibility of the applied instruments into a rehabilitation setting. *Conclusions:* The RMK-concept allows a standardised initial assessment of impairment and treatment needs. Furthermore it can be used for an objective comparison between rehabilitation centres. Similar results are available for the rehabilitation of alcohol dependence; more indication areas will be considered perspectively. A financial estimation of the RMK-case groups would be the last step towards DRGs in rehabilitation settings.

## *REHABILITATION AND RETURN TO WORK (OP 65–68)*

**OP 65**

## BARRIERS TO AND POSSIBILITIES OF RETURNING TO WORK AFTER A MULTI-DISCIPLINARY REHABILITATION PROGRAMME. A QUALITATIVE STUDY

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*Aim:* The aim of this qualitative study was to explore experiences of sick-listed persons of not returning to work during a 6-year period after participation in an extensive multidisciplinary rehabilitation programme. *Methods:* Semi-structured interviews were conducted and analysed by manifest content analysis. *Participants:* The study comprised 10 participants with musculoskeletal disorders, mainly neck and back pain. *Results:* This led to identification of three primary categories and six sub-categories, which described the participants' experiences of barriers to and possibilities of returning to work, and indicated what strategies they used to cope with everyday life. The participants described that the main barriers to returning to work were pain and somatic symptoms, fatigue, and not fulfilling the work requirements. Participants considered physical activity a key factor in coping with pain. Most participants thought that they had residual work ability, and could utilise this if they could get a modified job adapted to their own capacity. *Conclusion:* Our study highlights the importance of utilising residual working ability at workplaces. Finding flexible work possibilities requires an understanding and supportive attitude on the part of both the employer and the social insurance office.

**OP 66**

## BETWEEN UNEMPLOYMENT AND EMPLOYMENT: EXPERIENCE OF UNEMPLOYED LONG-TERM PAIN SUFFERERS

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*Aim:* The aim of this study was to explore and analyse how patients experienced possibilities for, and barriers to, rehabilitation and work return after participation in a multi-professional pain-rehabilitation program followed by a coached work-training programme. *Introduction:* Workers without employment are a vulnerable group in the working population. Unemployed workers with long-term sick leave often have severe difficulties in returning to the labour market (1–3). Studies in Sweden have produced evidence of positive effects for the rehabilitation of long-termed unemployed people, with or without disabilities (4–6). A review by Audhoeet al. (1) found however only weak evidence to support the use of vocational interventions for unemployed people to improve their work participation. Further research is needed. *Method:* An emerging qualitative design using Grounded Theory was used (7). The informants were 11 persons with long-term musculoskeletal pain who had participated in a multi-professional rehabilitation programme followed by a coached work-training programme. Individual interviews were used for data collection. *Results and Conclusion:* A theoretical model, "a way back to work", with three categories emerged. The main category "Experi-

ence of a way back to work" consisted of the informants' experience during the process between unemployment and employment and included the properties; sense of coherence, feelings, acceptance, own power and strategies. A pattern was discerned where the categories "Support" and "Negative response" influenced the process between unemployment and unemployment in different directions.

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**OP 67**

## WORK ABILITY INDEX AS A SCREENING TO IDENTIFY THE NEED FOR REHABILITATION: LONGITUDINAL FINDINGS FROM THE GERMAN SOCIOMEDICAL PANEL FOR EMPLOYEES II

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*Introduction:* Ilmarinen and colleagues from the Finnish Institute of Occupational Health introduced the work ability concept in the 1980s and later constructed the Work Ability Index (WAI) to operationalise it (1, 2). After conducting a series of studies to validate the predictive power of the WAI and its determinants, they proposed the WAI as a tool to identify the need for rehabilitation. However, there is no evidence from cohort studies demonstrating that the German version of the WAI is appropriate to identify the need for rehabilitation or rehabilitation-related problems. *Aim:* To analyse the predictive power of the WAI regarding the need for rehabilitation and rehabilitation-related variables. *Methods:* Data were collected during the first two waves of the German Sociomedical Panel of Employees II (GSPE-II), a large-scale postal survey designed to identify work-related environmental and personal risk factors affecting work ability and vocational participation. *Results:* Our analyses included 1,087 white-collar workers (mean age: 50.1; female: 44.9%). The WAI was strongly associated with health-related quality of life, cf. physical role (low WAI: b = –18.9; 95% CI: –20.3 to –17.6), certified disability (low WAI: OR = 2.0; 95% CI: 1.7 to 2.3) and retirement intentions (low WAI: OR = 3.7; 95% CI: 3.0 to 4.5). It predicted follow-up unemployment (low WAI: OR = 1.8; 95% CI: 1.5 to 2.3), future long-term sick leave (low WAI: OR = 3.4; 95% CI: 1.8 to 6.3), physicians visits (low WAI: b = 4.5; 95% CI: 4.0 to 5.0) and hospital stays (low WAI: b = 1.1; 95% CI: 0.7 to 1.4). The WAI was associated with subjective rehabilitation need (low WAI: OR = 3.4; 95% CI: 2.8 to 4.1) and rehabilitation intention (low WAI: OR = 2.7; 95% CI: 2.2 to 3.2). Moreover, the WAI had prognostic relevance for rehabilitation in the following year (low WAI: OR = 1.7; 95% CI: 1.4 to 2.1). *Conclusion:* The German version of the WAI is a valid screening instrument to detect the need for rehabilitation.

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**OP 68**

## EVALUATION OF A MULTIDISCIPLINARY REHABILITATION PROGRAMME WITH EMPHASIS ON MUSCULOSKELETAL DISORDERS. A 5-YEAR FOLLOW-UP

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*Aim:* To evaluate the participants with musculoskeletal disorders 5 years after completing a 7-week multidisciplinary rehabilitation programme, with focus on long-term results on pain intensity, physical disability, mental health and sick leave. *Method:* Sixty participants attended the rehabilitation programme and the 2-year follow-up, and 54 of the participants participated in the 5-year follow-up. The rehabilitation programme was individually adapted and consisted of physical activity in several forms, theoretical and practical education. All participants were evaluated at baseline, at 2 and 5 years intervals after completion of the programme with the degree of sick leave, pain rating (visual analogue scale), Disability Rating Index, Hospital Anxiety and Depression Scale and a stress test. *Results:* Between the start of the programme and the 5-year follow-up, pain rating ($p < 0.017$) and the rate of full-time sick leave ($p < 0.0005$) decreased. Achieved improvements in physical disability, anxiety, depression and stress were maintained from the 2-year follow-up occasion up until the 5-year follow-up. *Conclusions:* The rehabilitation programme seems to have an effect up to 5 years. Most participants had returned to work, reported less pain, and had improvements in physical disability and mental health up until the 2-year follow-up, and that was maintained at the 5-year follow-up occasion.

# *TEAM WORK IN REHABILITATION (OP 69–75)*

**OP 69**

## OVERVIEW OF OCCUPATIONAL THERAPY IN BALTIC COUNTRIES

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*Introduction:* The Baltic countries must be active to enhance quality and define and develop a European dimension within a given academic discipline, or other issues of common interest, through Occupational Therapists co-operation between University faculties or departments, academic and/or professional associations. Such co-operation should have a lasting and widespread impact (1). *Aim:* To describe the Occupational Therapy education and the trends of development of Occupational Therapy in Baltic countries. *Methods:* The investigation was done in May, 2011. Representatives of Occupational Therapy programs from Vilnius University, Riga Stradins University and Tallinn Health Care College were asked to fulfil a questionnaire about education, the number of professionals, labour market for graduates and activities of pro-

fessional organizations of occupational therapists. The Summary of the Occupational Therapy Profession in Europe was used as reference tool (2). *Results:* In 2011 the number of practicing Occupational Therapists per 100,000 of population is 4.8 in Latvia, 3.1 in Lithuania and 2 in Estonia. During the last 15 years there are some similarities and differences in getting Occupational Therapy education in Baltic countries. In all Baltic countries the applicants have possibilities to gain education of Occupational Therapy. In all three countries initial training for lecturers was done by specialists from Scandinavia. For study programs harmonization representatives from all countries institutions were involved in ENOTHE (European Network of Occupational Therapy in Higher Education) activities. Lithuania has training programmes in occupational therapy in two levels: non University and University (Bachelor and Master degree). But Latvia has Bachelor education program at University level and Estonia – in applied higher education level (collage). Due to intensive cooperation among educational institutions improvement of Occupational Therapy study programs in line with Tuning competences is observed (3). Occupation is the core topic of Occupational Therapy education and practice. It provides for Occupational Therapists' specific field in multidisciplinary rehabilitation systems. ICF tools are used to discuss occupation activities as categories of functioning and health. *Conclusion:* The results show more similarities than differences of occupational therapy between the Baltic countries. The most often mentioned uniting factors were theoretical background or philosophy of Occupational Therapy, actual conceptual practice models and recognized conceptual frameworks, for example ICF.

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## OP 70

## SUPERVISION IN HELPING PROFESSIONS: THE SITUATION IN LITHUANIAN SOCIAL WORK

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*Introduction:* There are many contrary attitudes about peculiarities of help-providing professions including health care, education, social work; their goals of collaboration and possibilities in Lithuania. *Aim:* The main goal of this paper was to investigate possibilities and preconditions for the supervision as "tool" for constructing professional identity self-management by analyzing the risk of stress and expectations of support on the basis of social workers' professional experience. The objectives were: 1) to disclose the experience of painful events in the professional activity of social workers, like a challenge to act or as a threat; 2) to analyze social workers' attitude to the expectations of support and the ability to use the supportive collaboration; 3) to underline the tendencies and prospects of the application of supervision as a method, that stimulates reflection and provides a possibility to reconsider and identify complexity of professional situations as well as personal experience. *Method:* This paper presents the results of the research where 81 social-services-providing institutions took part. *Results:* Data showed that social workers in regular activity mostly emphasize lack of support, and just emotional one. The need for the supervisor's enabling support tended to increase depending on one's competence. However, this was less expressed than the need for enabling support of the family. Those conclusions are significant in terms of the development of collaboration based on personal relationships and supervision. *Conclusion:* The analysis of the collaborative support indicates that when facing issues dealing with existence, the emotional support is mostly expected, and is further determined by both position held in the management structure of the agency and peculiarities of professional activity. The internal and external resources for consulting are often related to emotional support from colleagues with a great part of the respondents expecting emotional support from the leader.

## OP 71

## PREDICTORS OF COMMUNICATION PREFERENCES OF PATIENTS WITH CHRONIC ISCHEMIC HEART DISEASE

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*Introduction:* The patient-provider communication is essential for patient-provider interaction. Numerous studies show positive impact of good patient-provider communication on adherence, satisfaction, and treatment outcome (1). Congruence between patients' communication preferences and their health professionals' behavior enables good patient-provider communication (2). It is not easy to take the patient's preferences into consideration as patients may differ considerably in their preferences (3), making flexible reactions to the patient's preferences necessary (4). Therefore one needs to know these preferences. There are two ways to take into account patient's pReferences assessing preferences by questionnaire or using knowledge about predictors. *Aim:* This work aims at identification of predictors of patient's communication preferences. This study is funded by the German Federal Ministry of Education and Research. *Methods:* 342 patients (mean age 62.4 years (SD = 11.0), 20.2% female) with chronic ischemic heart disease from 3 inpatient and 3 outpatient rehabilitation centers participated. The KOPRA questionnaire (5) was used to asses the patient's communication preferences. The KOPRA consists of 4 scales: Patient participation and patient orientation (PPO), effective and open communication (EOC), emotionally supportive communication (ESC), communication about personal circumstances (CPC). We accounted for the following potential predictors: health related quality of life, age, sex, education, employment, income, chronification, comorbidity, anger disposition, perceived efficacy in patient-physician interactions, perceived coherence of the disease, locus of control concerning the disease, and the setting of the rehabilitation. We performed multiple regression analysis. *Results:* More PPO is wanted by patients of lower age, higher income and higher comorbidity. Patients preferring EOC show lower age and higher comorbidity. ESC is desired by patients with chronification between 1–5 years, a perceived external, fatalistic locus of control, lower perceived coherence of the disease, and a higher perceived efficacy in patient–physician interactions. Older patients believing the causes of their disease are fatalistic and external prefer KPV. The predictors explain 6.1–12.0% of the variance of the patient's communication preferences. *Conclusion:* We identified several predictors of communication preferences of patients with chronic ischemic heart disease. As predictors explain only up to 12% of the variance of patients' communication preferences, we suggest assessing them with the KOPRA questionnaire.

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**OP 72**

## COOPERATION-ORIENTED CURRICULA FOR PHYSICIANS AND SOCIAL WORKERS

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*Introduction:* The study focuses on the possibilities for overcoming the barriers stipulated by different professional cultures through the cooperation of physicians and social workers. The object of the study is changes of aims in curricula of physicians and of social workers. *Aim:* The study aimed at the substantiation of the changes in the cooperation oriented curriculum. The study was organized in triangulation: a) interpretation of the results of the qualitative analysis of practical cases, revealing different knowledge about the same interventional situations, and different attitudes of the employees of healthcare and social work institutions, b) the analysis of aims of the curricula, which revealed the fragmentary character of the preconditions for intercultural communication, c) analysis of graduation works, which showed that the students' choice to apply the multidisciplinary approach in studies of health and social issues was not limited to narrow professional viewpoints and created preconditions for cooperation in an interdisciplinary team. *Method:* The study was based on the capital (social, cultural) approach. Cultural capital is important when bridging social capital as it may promote partnerships, cooperation and intercultural understanding (Bourdieu, 1994, Gendron, 2004). Interpretation of the results was performed with the help of the collaboration theory (Abramson, Rosenthal, 1995). This theory emphasizes the importance of agreement on common aims between professionals of different fields in a team. Walter and Petr (2000) analytical model was used as the basic model. This model defines nine main dimensions of interdisciplinary collaboration. *Results:* The methods applied in the study were content analysis and interpretation. This analysis allows for stating that in the aims of the curricula of physicians and of social workers, there emerged changes that allow for a discussion on the development of intercultural competence.

**OP 73**

## TOWARDS A DEVELOPMENT OF EVIDENCE-BASED TEAMWORK IN REHABILITATION MEDICINE – A LITERATURE OVERVIEW

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*Introduction:* The inter-professional team is a fundamental element of working method within rehabilitation medicine, providing multimodal rehabilitation interventions. Studies indicate that the teamwork approach is associated with better patient outcomes, more appropriate care, lower costs, and safer care of better quality. However, in clinical practice, it is unclear whether all teams are as efficient as they are supposed to be, and what features of the teamwork are crucial and what external conditions a team need to be able to work effectively. *Aim and method:* A group of researchers at the Rehabilitation Medicine Clinic of the Danderyd University Hospital performed a literature review of factors affecting teamwork in general with the aim of applying the knowledge for developing evidence-based teamwork in rehabilitation medicine. *Results and conclusion:* Crucial factors found were: organizational determinants such as resources and support, work demands and outcomes, leadership, goals, competencies, roles, commitment, purposes and mission, and communication within the team. Furthermore, the organization's attitude towards teamwork, the value it places on teams, the support it gives to teams, as well as the organizational culture, has great impact on team function and team success. Based on this literature review, several actions have been taken to improve teamwork at our hospital department.

**OP 74**

## A MULTIPROFESSIONAL CLIENT-CENTRED MODEL FOR THE USE OF COMPENSATORY STRATEGIES IN BRAIN INJURY REHABILITATION

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*Introduction:* For the majority of patients with acquired brain injury, i.e. those with mild or moderate difficulties, the use of compensatory strategies is recommended (1). In clinical practice, rehabilitation professionals routinely provide compensatory strategies and devices, requiring new learning to make the most of the patients' ability to perform everyday activities. New learning is, however restricted in a number of different ways by the residual symptoms after brain injury. Although the importance of learning is undisputed, most therapists lack formal training in teaching techniques and rely to great extent on their own and their peers' clinical experience. Despite the fact that patient learning is a basic element of rehabilitation practices, systematic research on this topic has been scarce (2). *Aim:* To present a client-centred model based on multiprofessional methodology to enable the successful implementation of compensatory strategies and devices. *Methods:* A qualitative process in several steps was used for the model building. Neuropsychological and occupational therapy models and methods for assessment, evaluation and teaching were analysed. Model building was a stepwise process using the ICF framework and was corroborated by triangulation. *Results:* A multiprofessional model consisting of seven steps was developed. The model includes goal-driven assessment of needs and limitations, the choice of relevant compensatory strategies, its teaching, training and evaluation of individual needs and limitations. *Conclusion:* The model describes tools for occupational therapists and neuropsychologists to develop a multi-professional client-centred method for learning, training and long-term use of compensatory strategies and devices.

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**OP 75**

## A MULTIPROFESSIONAL HABILITATION TEAM – A CHILD'S RESOURCE OF SALUTOGENESIS

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*Introduction:* Polemics has become topical as to humanisation of institutional care emphasising the idea of organisation of such a care system (environment) in which a child feels safe, is healthy, develops on a balanced basis and is ready for a self-dependent and autonomous life action (1). Consequently, on the basis of comprehension of the situation of the abandoned children and care accordingly to the social policy as declared by modern society as well as taking into account traditional care difficulties of such children the main aim of the institutional care is organisation of a unified approach of such education, care and habilitation and use of the instrument of unified assessment (2) that would provide and promote child's salutogenesis (child's comprehension and attitude towards its health that initially is provided by care staff) (3). Achieving of this aim anticipates both a child's balanced development and organisation of a continuous everyday mutual learning (specialists–specialists, children–care staff), namely in the institutional care the idea of everyday support is actualised as cooperation of specialists of various branches for promotion of a child's salutogenesis. Just multiprofessional teams in long-term and a unified instrument of assessment in dynamics are often lacking in the care of abandoned children (4). *Aim:* To investigate concordance between indices of Munich functional development diagnostics (MFAD)

summed up by BSAC in long-term and the corresponding individual habilitation plans. *Methods:* The study was done within the framework of a Children social care centre by using MAFD for obtaining data. For data analysis in this study the indices of MFAD about 40 children in age less than two years and individual habilitation plans in the period of 2008–2011 were used. *Results and conclusions:* In BSAC care is taken of both children from their birth and the ones who at different ages have joined it from socially unfavourable environment. By making use of MFAD indications one can conclude that the indices differ in dynamics, namely the indices of the development of those children who receive full professional care of an interdisciplinary team from their birth and the ones who have joined it from socially unfavourable environment. Consequently, applying a unified assessment allows to define risk factors in the child's development as well as the child's resources providing the child's salutogenesis in the early age stage. It helps to substantiate and to choose supporting habilitation for a child's needs. MFAD, as a unified instrument of assessment of a multiprofessional team allows in a long-term perspective to develop a profile of a child's development. It provides a possibility to use specialists' resources of the institution.

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## *QUALITY OF LIFE (OP 76–77)*

### OP 76

### RESPONSE SHIFT IN QUALITY OF LIFE ASSESSMENT IN PATIENTS WITH CHRONIC BACK PAIN AND CHRONIC ISCHEMIC HEART DISEASE

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*Introduction:* When measuring changes in the context of the evaluation of intervention effects in patients with chronic diseases, a method of indirect measurement of change is predominantly applied (1). This method rests on the assumption that patients refer to the same internal evaluation standards in post-tests as they applied in pre-tests. However, it should be taken into account that these standards are not necessarily to be constant as they can be reconconeptualized, reprioritized or recalibrated (response shift, RS, (2)) – thus RS challenges the validity of change scores deriving from pre- and post-test data. *Aim:* The objective of this study is to examine the extent and type of influence of RS, on the assessment of changes in health-related quality of life (HRQoL) after inpatient rehabilitation of patients with chronic back pain (CBP) and chronic ischemic heart disease (CHD). *Methods:* Response shift was assessed in two samples (CBP: $n = 189$, CHD: $n = 328$) using then-test (3) and structural equation modelling (SEM) (4) approaches. HRQoL was recorded in a questionnaire study at the start and end of rehabilitation using disease-specific instruments. Global items were also developed to collect data on HRQoL at the start and end of rehabilitation; as well as for the retrospective evaluation of HRQoL at the beginning of rehabilitation (then-test). Effect sizes for observed change, RS, and true change were calculated. *Results:* There are small to medium recalibration effects ($0.07 \leq d \leq 0.61$) in the then-test in both diseases which may underestimate the actual effects of change. Using the SEM approach, small uniform and non-uniform recalibration effects ($0.10 \leq d \leq 0.29$) appeared in a few of the scales which cause true change scores to be under- and over-estimated accordingly. *Conclusions:* Our study provides evidence that RS is an important phenomenon in the assessment of HRQoL in an inpatient rehabilitation context also. Therefore it should be included in the assessment to enable a more valid interpretation of rehabilitation effects. The SEM approach's results – which are assumed to be more convincing – however, suggest that RS does not lead to fundamentally different results in rehabilitation effects. Still both methods lack the possibility of explaining causes of RS.

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### OP 77

### ANALYSIS OF HEALTH-RELATED QUALITY OF LIFE OF CHILDREN WITH SPECIAL NEEDS IN RIGA CITY IN 2009–2011

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*Introduction:* Since 2009 the Welfare Department of Riga City Municipality has launched a long-term project on quality of life (QoL) of children with special needs. *Aim:* To assess and to compare self-reports of health-related QoL of children with developmental disorders with proxy reports of their parents as well as with European normdata from KIDSCREEN materials (1, 2); to investigate associations between family/child variables with the child's QoL; to explore provision of social services associated with QoL in these families, to find out changes in QoL reports during three assessments (2009–2011). *Methods:* Settings: Social service office of Riga City Municipality. Participants: 34 families with 9–12 years old children with developmental disorders got involved in the study; both children themselves and a parent filled in questionnaires. Instruments: KIDSCREEN-52 (children's and parents' questionnaires) in Latvian (1, 2) was used to obtain information, Quebec user evaluation of satisfaction with assistive technology, questionnaire about received social services were used to acquire information. *Results and Conclusion:* The data collection of the 3rd assessment is continuing. Results of the study of years 2009–2010 show: self-assessment of QoL of children with special needs compared with their parents' assessment changes over the years. It should be noted that self-assessment of QoL for the children with developmental disorders differs from their parents' assessment on it: children themselves evaluate their QoL comparatively higher than their parents do. Self-assessment rating of QoL of Latvian children with special needs is lower than their European peers.

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## SCI REHABILITATION (OP 78–79)

### OP 78

### PILOT STUDY OF INTERNATIONAL SPINAL CORD INJURY DATA SETS AND SCIM-III FOR ASSESSMENT AND DOCUMENTATION

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*Introduction:* About 30 new traumatic spinal cord injury cases are treated in NRC "Vaivari" annually. Since 2002, an international workgroup of experts has developed International SCI Data Sets, based on International Classification of Functioning, Disability and Health (ICF) with the purpose to collect and report data in uniform and standardized manner. *Aim:* To get experience of applying International SCI core Data Set in clinical practice. *Methods:* During 2010, 71 patient data was collected using International SCI Core Data Set. 39.4% (28) of them was on first time rehabilitation, 60.6% (43) for repeated rehabilitation. Mean age 42.7 ± 14.56. Fifty-two of the patients were male, 19 female. For 69 of the patients, International SCI Lower Urinary Tract Function Basic Data Set were used. Forty-nine of these patients were assessed using SCIM-III at the beginning and 43 at the end of rehabilitation. *Results:* Injury etiology: fall (35.2%), traffic accidents (26.8%), sports trauma (2.8%), violence (2.8%), other traumatic cause (11.3%), nontraumatic spinal cord dysfunction (18.3%) and unspecified or unknown (2.8%). 84.5% of them had a vertebral injury. Neurologic data shows that sensory examination of SCI levels is 22.5% for cervical, 63.4% for thoracic, 7.0% for lumbar and 7.0% normal neurological examination. Motor examination, respectively, is 35.2%, 38.0%, 25.4% and 1.4% normal neurological examination. At the beginning of a rehabilitation course, it was complete injury (A - ASIA Impairment Scale) in 25.6% of the patients, incomplete (ASIA B: 35.2%, ASIA C: 25.4% and ASIA D: 9.9%). Normal voiding as main method for bladder emptying were used only in 18.8% of the patients. Most common voiding methods for the reported population were self-catheterization 34.8% and bladder reflex triggering (both voluntary 13% and involuntary 13%). 45.1% did not use collecting appliances for urinary incontinence, 38.0% used diaper or pad. 50.7% did not use any drugs for urinary tract within last year, 43.7% used antibiotics or antiseptics for treatment of urinary tract infection or prophylactic reasons. Mean value of SCIM-III for first time patients were 39.2 at the beginning, and 68.4 at the end of rehabilitation, for repeated patients this values were 59.6 and 64.8, respectively. *Conclusion:* Joining International SCI Society and using International standards for collecting and reporting data in clinical practice, allows us planning to use data in clinical studies in the future and starting to use other International SCI Core Sets, hence improving SCI examination, treatment, rehabilitation, and prevention programs.

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### OP 79

### DEVELOPMENT OF RECREATION PROGRAM FOR PERSONS WITH SPINAL CORD INJURY

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*Introduction:* Persons after spinal cord injury (SCI) experience a dramatic change in daily life – disrupted life habits in relation to the consequences of the injury, participation in occupational and recreational activities (1). The goal of therapeutic recreation is to identify leisure activities as an integral criterion of the quality of life. The process of therapeutic recreation includes functional intervention, leisure education and reintegration in recreation improving independence during leisure activities (3). Following rehabilitation models developed in USA and Canada, a specialized rehabilitation program for spinal cord injured persons requires therapeutic recreation shown to be efficient in several projects (2). *Aim:* To develop a recreation section in spinal cord patient`s rehabilitation program and assess its effectiveness applyed to persons with SCI. *Methods:* The study was done in National Rehabilitation center Vaivari, Jurmala in 2011. The study included 14 participants with traumatic and non-traumatic SCI. To develop an individual recreation program and assess its effectiveness, participants have been evaluated by two standardized instruments – Canadian Occupational Performance Measurement (COPM) and Spinal Cord Injury Measurement (SCIM). Following the prepared plan, the participants were involved in meaningful leisure activities during individual and group work. *Results:* Fourteen persons participated in the study, all were males – 12 with traumatic SCI and 2 with non-traumatic SCI. The mean age was 45.5 ± 24.5 years. Assessed with COPM participants independently identified difficulties of occupational performance and evaluated its importance, performance and satisfaction before and after therapy. Results showed that changes of occupational performance were clinically meaningful in all components. Results of SCIM showed that self-care and mobility were also improved. *Conclusion:* The results of assessment of the recreation program indicate that the therapy has been effective for persons with SCI – in all cases clinically meaningful changes have been observed. The therapeutic recreation may significantly improve quality of life through leisure education.

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## REHABILITATION ECONOMY (OP 80)

### OP 80

### COMPARISON OF EXPENDITURES ON SERVICES OR REHABILITATIVE CARE IN EUROPEAN COUNTRIES

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*Introduction:* In PRM a variety of systems, services and approaches have been evolved in different European countries. We do not know how much the European countries differ in the financial resources spent for rehabilitative care and, eventually, to what degree these might relate to differences in functional outcomes. *Aim:* The aim of the present study was to describe the differences in financial resources spent between European countries and to explore different reasons for expected variations. *Methods:* Data on health care expenditure and additional methodological information provided by the countries were obtained from Eurostat. We compared per capita expenditures, proportion of spending on rehabilitative care on current health expenditure (CHE) and proportion of spending on rehabilitative care on gross national product. *Results:* Twenty-two out of 27 countries provided information on resources for rehabilitative care. Per capita spending ranged from 3.18 € in Slovakia to

166.36 € in Iceland. Proportion of spending on rehabilitative care on CHE ranged from 0.63% in Slovakia to 11% in Cyprus with the average being 3.04%. A country's population density is associated with rehabilitative care: out-patient rehabilitative care plays a smaller role in sparsely populated countries than it does in highly populated countries. Expenditure on rehabilitative care as percentage of CHE below average comes along with the share of services or rehabilitative care delivered in an in-patient setting being above average. Countries spend more on rehabilitative care if the share of expenditure of the private sector and the general government is similar between CHE and rehabilitative care. *Conclusion:* The validity of the data available on expenditure on rehabilitative care still seems to be restricted. The large variations in spending might be the result of different reporting approaches. Cyprus, for example, computed the expenditure on rehabilitative care by disaggregating curative and rehabilitative care by a proportion of 80% and 20%. On the other hand, plausible association between countries characteristics and financial resources for rehabilitation were found, indicating at least some validity of the data. The results show that it is necessary to obtain more reliable and detailed information about expenditure and to enhance an international discussion on this topic.

## *CAUSES FOR INJURY (OP 81)*

### OP 81

### REASONS FOR FALL INJURIES WHICH CAUSED HIP FRACTURE

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*Introduction:* It seems urgent to find ways to prevent falling, especially among individuals prone to repeated falls. Cumulative effect of multiple risk factors would contribute to the tendency of falls. *Aim:* To characterize possible reasons for fall injury in people, most of them elderly, who broke their femoral neck. *Methods:* The sample included 100 patients, of whom 63 women and 37 men, hospitalized for rehabilitation after hip fracture operation. All patients were interrogated about the fall injury by a physician from the rehabilitation department, examined by an ophthalmologist in order to discover eventual ocular problems and were imposed to a cognitive evaluation (MiniMental) done by an occupational therapist. Their medical sheet provided more information about previous disease. *Results:* The average age of the patients was 78 years, and weight average, 69 kg. 68% of them fell during light time, between 6 am and 6 pm. 64% of the patients fell because of personal reasons and other 30%, as a result of extrinsic reasons. 55% of the patients stayed with another person while the fall event happened. 38% of them used to take tranquillizers or medications for sleep. 52% used slippers, while 20% walked barefoot. 77.6% of the patients who needed (eye) glasses did not use them when they fell down. 67% suffered from ophthalmic disease. 71% of falls occurred indoor and 29% outdoor. 64.1% of the patients served by a walking aid, did not use it while falling. 78% suffered from a disease which could influence the patient's balance during weight bearing. Seventy percent had a short-term memory disorders and 57% in concentration and 49% in orientation. *Conclusion:* It seems that the main reasons for fall injuries which cause fracture in the femoral neck are old age, unsuitable footwear, the existence of ocular diseases, the non-use of glasses and, if necessary, not using walking aid, the existence of other diseases that can influence the stability, and some cognitive problems, especially in the fields of short-term memory and concentration.

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# POSTER PRESENTATIONS

## *ICF METHODOLOGY, ENVIRONMENTAL FACTORS AND TEAM WORK*

### PP 01

### THE INTERRATER RELIABILITY OF AN ICF-BASED ADL ASSESSMENT TOOL

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*Introduction:* Rehabilitation clinicians are familiar with and utilise a variety of ADL outcome measures. The ICF (International Classification of Functioning Disability and Health) has been developed as a global classification system that provides a common language for describing a patient's health status. Published literature demonstrating the psychometric properties of ICF based outcome measures and their clinical application is currently lacking. *Aim:* This study aims to test the interrater reliability of an ICF based ADL assessment tool on patients in a rehabilitation ward. *Methods:* A prospective clinical trial with two investigators independently reviewing the notes and using an ICF based ADL tool to score the function of each new admission to the rehabilitation ward from 01/03/2011. The scores were based on the observations recorded by the rehabilitation multidisciplinary team in the 3 days after admission and 3 days prior to discharge. Interobserver agreement was evaluated using the Kappa Statistic. *Results:* 120 paired ratings were included in the analysis, including admission and discharge ratings. Kappa ratings varied between 0.052 for the ICF category receiving nonverbal messages and 0.707 for the ICF category of eating. Overall 5 ICF demonstrated substantial agreement (K 0.6–0.79), seven items demonstrated moderate agreement (K 0.4–0.59), five items demostrated fair agreement (K 0.2–0.39) with the remaining 3 items demonstrating slight to chance agreement. Some of the items with poor interrater agreement were not relevant to most of the patients and therefore were not rated and should probably not be included in a general ICF ADL outcome measure. Kappa as a statistical tool has its limitations and some of the low kappas actually have good agreement when the raw tables are reviewed. *Conclusion:* The results of this study demonstrate good agreement in many of the rated activities. This study demonstrates the potential of an ICF based ADL Assessment Tool and merits further work.

### PP 02

### DESCRIBING FUNCTIONING AND DISABILITY BY USING AN ADAPTED COMPREHENSIVE ICF-CORE-SET BASED PROFILE WITH QUALIFIERS, DEVELOPED FOR PATIENTS WITH CHRONIC PAIN CONDITIONS

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*Introduction:* Further clinical research is desired in order to improve the clinical application of the ICF (1). *Aim:* 1) to describe a recently developed Adapted Comprehensive ICF Sore-sets-based profile (ACICSP) for assessment of patients with chronic pain in a rehabilitation medicine team setting with vocational orientation; 2) another aim was to investigate the criterion validity of this assessment profile by comparing with other assessment instruments used. *Methods:* The published ICF core sets for low back pain and chronic widespread pain (2, 3) were used as a basis for the development of the ACICSP which covers 47 ICF categories; 16 body functions, 21 activity/participation, 10 environmental factors. The ICF qualifier 0-4 scale was used for the rehabilitation team's assessment of patients' degree of functioning/disability of each category of the ACICSP. The 0–4 qualifiers translate into no/mild/moderate/severe/complete impairment, difficulty or barriers (1). To investigate the criterion validity of parts of the ACICSP, comparisons with other measures were made and a non-parametric Spearman rank order correlation was used. The selection of variables included in this analysis was based on agreements between ICF codes represented in the ACICSP and other constructs represented in other established assessment instruments; e.g. the 'ACICSP category b1300 = energy level' was considered in agreement with 'the SF-36 subscale vitality'. The ACICSP was applied to a consecutive series of 54 patients referred from mainly primary care for outpatient multimodal pain rehabilitation at a university clinic, in combination with assessment by means of e.g. SF-36 and HADS. *Results:* There were moderately strong correlations between the 'SF-36 physical function' and 'ACICSP categories walking (d450) ($r$ = –0.68), and moving around' (d455) ($r$ = –0.72). Fair correlations were found between 'SF-36: physical function' and the 'ACICSP categories changing basic body positions (d410) ($r$ = –0.31), lifting and carrying objects a (d430) ($r$ = –0.33), washing oneself (d510)($r$ = –0.50), domestic life (d620, d630, d640)($r$ = –0.45), and recreation and leisure' (d920) ($r$ = –0.34). A fair correlation was found between 'SF-36: role emotional' and 'ACICSP category remunerative employment' (d850) ($r$ = –0.36). *Conclusion:* The study has added experience of applying an adapted comprehensive ICF core-sets-based profile in multiprofessional rehabilitation team-based clinical assessments in pain rehabilitation with vocational orientation.

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### PP 03

### ADAPTATION OF CATHOLIC CHURCHES' PHYSICAL ENVIRONMENT TO NEEDS OF PEOPLE WITH PHYSICAL DISABILITY IN VILNIUS CITY

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*Introduction:* A person's disability can be realized as a conflict with the environment; it is a reason why it is so important not only to treat and rehabilitate the person but also change and adapt his environment to meet his special needs due to disability. *Aim:* To evaluate the adaptation of Catholic churches' physical environment regarding needs of people with physical disability in Vilnius city. *Methods:* The research objective was to evaluate physical and nearby environment connected with access to Catholic churches in Vilnius city. Research method: interviews of 26 priests and 30 people with physical disability who visit churches, observation of internal and external physical environment in 26 churches. *Results and Conclusion:* To access church people with physical disability face many barriers in public environment: there are no parking places near 13 churches, 15 public transport stops are not adapted, in 10 cases pavement leading towards the church was narrow, uneven, with high curbs; there were hillsides or slopes near 15 churches. External environment of churches has many barriers for people with physical disability: there were no platforms near 9 churches; doors were

too narrow in 10; appropriate height of the door threshold was only in 1 church; appropriate height of the stairs was in 8, appropriate width of the stairs was in 10 churches. Twenty-one priests of 24 visit people with physical disability in their homes. Fourteen visit those people 1–2 times per month, 7 if they are asked for the visit. Interviews with priests showed, that adaptation was financed by the municipality only in 2 churches, 9 churches were adapted by finances of both church and community. People with physical disability, state that there are many barriers to access churches freely and independently. Main barriers for people with physical disability in accessing church are: absence of platform, absence of banisters near platform or stairs, heavy or narrow door, and lattice near the door.

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**PP 04**

## EVALUATION OF PATIENTS' OPINION ABOUT RECEIVED PROCEDURES AND REHABILITATION TEAM INPUT IN TEACHING THE PATIENTS AT A REHABILITATION, PHYSICAL AND SPORT MEDICINE CENTRE

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*Introduction:* In order to get the best effect of rehabilitation, it is very important for patients to accomplish procedures correctly. The sequence of procedures and breaks in between are also very important. In order to obtain good rehabilitation results, collaboration between rehabilitation team and patient is necessary. *Aim:* To evaluate patients' opinions about received procedures and the rehabilitation team's input in teaching patients. *Method:* A momentary survey was done using two anonymous questionnaires (for patients and rehabilitation staff members). Staff members of the Rehabilitation, Physical and Sport Medicine Centre were questioned (8 PMR doctors, 25 nurses, 16 physiotherapists, 6 occupational therapists). Seventy-five patients were questioned (20 patients at the Unit I of In-patient Rehabilitation, 30 patients at the Unit II of In-patient Rehabilitation, 25 patients at the Unit of Out patient Rehabilitation department). *Results:* Patients from separate units evaluated differently the value of performed procedures. Patients at the in-patient unit valued psychologist's and social worker's consultations, occupational therapist's procedures more than patients in the out-patient unit. The patients would like to know more about the effect of physical modalities (40% of in-patient unit patients, 68% of out-patient unit patients). Nurses from the in-patient unit provided more information about procedures compared with nurses from the out-patient unit (80% of in-patient unit nurses, 32% of out-patient unit nurses). It may be explained by the fact that at the in-patient unit the patients communicated longer with nurses, compared with patients of the out-patient unit. Patients liked to get more knowledge about the procedures from PMR doctors. All rehabilitation specialists answered, that they provide information to the patients about their procedures. 96% of the specialists thought that they should teach the patients, others answered that only doctors should do it. 13% of the specialists thought that every member of a rehabilitation team should provide general information about rehabilitation, 87% answered that they should teach the patients only about their own procedures. *Conclusion:* The value of procedures was differently evaluated by patients of different units. Nurses of the in-patient units provided more information about procedures, compared with nurses of the out-patient unit. A majority of rehabilitation specialists thought that every team member should teach patients only about their own procedures.

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## *WORK, EMPLOYMENT, LEISURE*

**PP 05**

## ADVERSE EFFECTS OF EFFORT-REWARD IMBALANCE ON WORK ABILITY: LONGITUDINAL FINDINGS FROM THE GERMAN SOCIOMEDICAL PANEL OF EMPLOYEES II

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*Introduction:* Recent studies indicated adverse effects of effort-reward (ER) imbalance on work ability (1, 2). However, these studies were limited by their cross-sectional design. *Aim:* To analyse the longitudinal effects of effort-reward imbalance on new cases of restricted work ability. *Methods:* Data were collected during the first two waves of the German Sociomedical Panel of Employees II. Work ability was assessed by the Work Ability Index (WAI) (3, 4). Risk factors were evaluated during the first wave in 2009. The ER ratio was assessed by a standardised questionnaire (5). To identify risk factors for incident cases of restricted work ability, only persons with good work ability (WAI $\geq$ 37) were included in our analyses. Logistic regression models were used to estimate the effect of ER imbalance on the occurrence of restricted work ability (WAI < 37). Our multivariate analyses were adjusted for age, gender, educational level and physical demands (Model 1), health-related behaviour (Model 2) and both dimensions of the demand-control model (Model 3). A fourth model was estimated by backward exclusion. *Results:* Our analyses included 599 full-time white-collar workers with good work ability in 2009 (mean age: 50.7; 69.9 % male). Eighty (13.3 %) new cases of restricted work ability were reported one year later. The ER ratio predicted new cases of restricted work ability in all four models. An increase in ER imbalance by about 1 SD raised the odds for new cases about the 1.3- to 1.5-fold. This also held true after adjusting for both dimensions of the demand-control model (OR = 1.339; 95% CI: 1.003 to 1.787; $p = 0.047$). In the fourth model, the ER ratio (OR = 1.510; 95% CI: 1.210 to 1.885; $p < 0.001$), age, educational level, smoking and low job control were identified as risk factors for new cases of restricted work ability. *Conclusions:* Reciprocity and fairness at work, as operationalised by the effort-reward imbalance model, has an impact on work ability independent of and above that of other known explanatory variables. Future epidemiological research within the framework of the work ability concept should examine leadership, personal management and other aspects of work organisation and their impact on work ability.

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**PP 06**

## EMPLOYMENT FEATURES OF PERSONS AFTER SPINAL CORD INJURY

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*Introduction:* After spinal cord injury people can not choose or apply for a job in traditional workplaces, as employment opportunities are limited by external environmental factors (lack of environmental adaptation, transportation problems, negative attitude of employers, lack of available professions) and internal (functional independence, motivation) factors. Due to this fact it is very important to determine which factors are mostly influencing employment features of people after spinal cord injury. *Aim:* Evaluate employment features of people after spinal cord injury. *Methods:* Research was performed during 2010 June–September in a summer camp 'Landscape therapy and recreation centre', located in Monciškių village. 101 persons with spinal cord injury participated and they were interviewed once after arriving to the summer camp. To find out influence of external factors to employment persons were intervied using questioning. For evaluation of functional independence the Functional independence measurement (FIM) was used. *Results:* Eighty (79.7 %) respondents were men and 21 (20.8 %) women, age average was 35 ± 8.8 years. Fifty-one (50.5%) had the injury at the cervical, 38 (37.6%) the thoracic, and 12 (11.8%) the lumbal level. The participants had their spinal cord injury 11.4 ± 7.3 years (mean, SD) ago. During the research 30 (29.7%) respondents were working, but 59 (58.9%). tried to find a job. Most help in finding a job was personal contacts 15.8%, working as disabled worker 10%, participation in employment programs or disabled people projects 11%. Main employment barriers of external environment were: lack of environmental adaptation 18.8%, negative attitude of employers 16.8%, lack of available professions 11.9%, transportation problems 10%. Nine percent of the respondents stated, that it is difficult to find a job due to psychological problems, 12% did not have motivation to work and 21% thought that they could not work due to their health problems. Functional independence of working persons after SCI was higher, compared with not-working persons (respectively 104.4 ± 17.7 score and 84.8 ± 26.4 score, $p > 0.05$). But 10 working respondents had not the highest score of functional independence (persons with tetraplegia). *Conclusion:* Employment features of persons after SCI are mainly influenced by external environmental factors: not adapted environment, negative attitude of empoyers, problems with transportation, small opportunities to participate in labour market. Functional independence as internal factor influences less on employment than motivation, confidence or initiative to working activity.

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**PP 07**

## THE OPINION ON VOLUNTEERING AMONG OCCUPATIONAL THERAPY STUDENTS AT VILNIUS UNIVERSITY

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*Introduction:* 2011 is announced as the Year of Volunteering. Western world has a long tradition of volunteerism. According to 2010 statistics 11% of Lithuanians regularly volunteered, meanwhile in the Scandinavian countries, 50% of the population was engaged in volunteering. Volunteering in Lithuania has not yet been recognized. *Aim:* To investigate the Vilnius University Occupational Therapy bachelor level students` knowledge about, opinion on volunteering and experience as volunteer. *Methods:* The investigation was done in November, 2010. All 66 students filled out a questionnaire, which consisted of 15 open questions. *Results:* The average age of the subjects was 21 years. 95% of the students knew what volunteering is and 40% had participated in volunteering activities. 64% of the students would like to engage in volunteering activities and spend 2–3 h/day, 2 times per week. Students who would like to engage in volunteering would mostly choose activities with children (50%), elderly persons (10%), patients (8%) and for 31% of the students it was not important with whom. They would prefer to do activities like organizing leisure time, socializing or occupying according to personal needs. The main reasons why 36% of the students did not want to engage in volunteering was lack of time and information. Factors that would stimulate them to volunteer was investigated and they pointed out more information, more free time after studies, getting certificates and benefit of looking for jobs. *Conclusion:* More than half of the students would like to engage in volunteering activities. A majority would like to do activities with children. They would organize leisure time, socialize or occupy themselves according to personal needs. Students who were not interested in volunteering, state that more information, free time or getting some benefit of looking for jobs would motivate them.

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**PP 08**

## THE NEED OF ADDITIONAL LEISURE ACTIVITIES FOR PATIENTS WITH SPINAL CORD INJURY IN AN ACUTE REHABILITATION UNIT

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*Introduction:* Leisure is an important component in the lives of persons with disabilities. Patients with spinal cord injury usually have restricted possibilities of spending leisure activities. *Aim:* To evaluate the need of additional leisure activities for patients with spinal cord injury. *Methods:* The study included 40 people with spinal cord injury. They were on a comprehensive rehabilitation course. Patients were evaluated according to FIM and filled out a questionnaire. *Results:* 65% of the patients had tetraplegia, 35% patients had paraplegia. Before the injury 62.5% of the patients spent their free time meeting with friends, 27.5% of the patients did household work. In the beginning of rehabilitation, the FIM of patients with tetraplegia was 57.04 ± 22.42 points; the FIM of patients with paraplegia was 70.43 ± 18.71 points. 30.8% of the patients with tetraplegia and 28.6% of the patients with paraplegia responded that they were satisfied with day activities in the hospital, 69.2% of the patients with tetraplegia and 71.4% of the patients with paraplegia said that they would like to have more activities in the afternoon. Proposed additional leisure activities: watching films, basketball, art activities, etc. Only 17.9% of the patients attended the activities every time. Attendance of additional activities did not change despite increasing independence level. In the end of the rehabilitation, the

FIM of the patients with tetraplegia, increased to 71.12 ± 23.04 points; the FIM of the patients with paraplegia, increased to 95.00 ± 15.27 points ($p < 0.05$). The most common refusal reason of patients with tetraplegia was fatigue after all the procedures. Patients with paraplegia said that they wanted more interesting, newer activities. *Conclusions:* The majority of respondents would like to have additional leisure activities in the afternoon. However only 17.9% of the patients participated every time in additional leisure activities. The most common reasons of refusal were fatigue and the need for more interesting, newer activities.

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## *MOBILITY: WALKING, MOVING AROUND, HAND AND ARM USE. SELF-CARE*

### PP 09

### INTRA-RATER TEST-RETEST RELIABILITY OF THE SIX MINUTE WALK TEST IN SUBJECTS WITH POST-POLIO SYNDROME

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*Introduction:* The number of polio patients in the Swedish population is estimated to be approximately 15,000 and approximately 90% of these have post-polio syndrome (PPS). Common symtoms of PPS are muscle weakness, fatigue, muscle pain and joint pain. The ability to walk is an important function which enables participation in daily life activities. Many patients with PPS have lower limb muscle weakness which limit their ambulation. The six minute walk test is often used in the physiotherapy clinic and a greater distance indicates a better performance. *Aim:* The aim of this study was to determine the intra-rater test-retest reliability of the 6 minute walk test in subjects with PPS. *Methods:* Patients who were able to walk with or without a walking aid for 6 min were recruited in the study. The patients included, performed three six minute walk tests, with 30 min rest between each. They used their ordinary walking aid, their ordinary shoes and were not given any physical assistance. Borg scales were used to evaluate leg tiredness, breathlessness (CR-10, Category Ratio Scale) and exertion (RPE, Ratio of Perceived Exertion). The six minute walk test was administered in a 20 m long corridor. Subjects were told to walk as far as possible during the six minutes. They were informed that they were allowed to rest. *Results and conclusion:* A total of fourteen patients (8 woman and 6 men, median age 69) with PPS participated in the study. The mean, (Std. Deviation) was for test 1: 270.4 m (69), test 2:274 m (73) and test 3: 273.9 m (75). Intraclass Correlation Coefficient (ICC2) was used. Reliability was high, between test 1–2 (ICC2 = 0.982) and between test 2–3 (ICC2 = 0.986). The results show that a practice trial followed by a second test can be recommended. In conclusion, the present study indicates that the six minute walk test is reliable for subjects with PPS.

### PP 10

### MEASURES USED IN STROKE REHABILITATION AS PREDICTORS OF WALKING CAPACITY

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*Introduction:* Although many persons after stroke are able to transfer and walk independently at discharge, their mobility is insufficient to cross a street safely, climb and descend from the sidewalk etc. Improvement of these skills should be one of the rehabilitation goals. It is important to know not only how walking speed improved, but also the extent to which the functional level of walking can be achieved. Gait velocity can be stratified into functional ambulation classes, such as household ambulation (< 0.4 m/s), limited community ambulation (0.4 to 0.8 m/s), and full community ambulation (> 0.8 m/s). *Aim:* To investigate the meaning of results from several measures used in stroke rehabilitation in the prediction of functional level of walking at discharge. *Methods:* Patients after stroke were classified into two groups, depending on the ability to perform 10 m timed walking test. The participants of one group could perform 10 m timed walking test, but the participants of another group were not able to perform this test. We used the FIM, Motor assessment scale (MAS), 10 m timed walking and "Up and Go" test. *Results:* Fifty patients (23 women and 27 men, aged 40–80 years) were enrolled in the study. The first group of participants' walking speed improved by 11% and the results of FIM (sphincter control) predict walking speed at discharge from rehabilitation. In the second group of participants the walking speed improved by 13.7% and the ability to move from supine lying to sitting over side of bed (MAS) predicted the walking speed achieved at discharge from rehabilitation ($r = 0.629$, $p < 0.05$, $p = 0.354$). Eleven (29%) participants in the second group switched from lower functional ambulation level to a higher level. *Conclusion:* Only the participants from the second group improved their abilities to a higher functional level. The better predictors were FIM in the first group and MAS in the second group.

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### PP 11

### MEASUREMENT AND ANALYSIS OF FOOT PRESSURE DISTRIBUTION IN PRESCHOOL CHILDREN

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*Introduction:* The present paper was carried out in the framework of the bachelor's degree programme in physiotherapy. Structural characteristics of the foot, such as arch type, affect pressure distribution. High-arched foot tends to concentrate pressure beneath the heel and forefoot, with minimal pressure beneath the midfoot. The flexible flat-arched foot shows more spreading of pressure, including the area beneath the midfoot (1). The prevalence of flexible flatfoot in three to six year old children is 44%, but prevalence of pathological flatfoot is less than 1%. Some experts suggest well timed prophylaxis, diagnostics and treatment of the flexible form of pes planus, because it may lead to disability, joint damage and, in later life, a rigid fixed foot deformity (2). *Aim:* To measure foot pressure distribution in children aged 5–6 years and to use the results acquired during a pilot study for data base creation. *Methods:* Study participants: Forty-eight preschool children took part in this study. Inclusion criteria – children aged 5–6 years attending the nursery schools included in the study. Exclusion criteria – congenital anomalies of the extremities. A questionnaire was used for the parents of study participants. Anthropometric data were measured. A plantograph 'Rsscan Foot scan system' was used to measure foot load distribution in static and dynamic regimes. The research data were collected and analyzed in Microsoft Office Excel 2007 (chi-square) and SPSS Statistics 19 (descriptive statistics (mean, standard deviation), comparative statistics (*t*-test), significance value of $p < 0.05$. *Results and conlusions:* The study showed that in the dynamic regime pressure distribution expressed as a percentage decreased in the heel area and middle

foot but increased in the area of metatasal bones and phalanges. The comparison of contact area measurements of separate plantar surface zones in static and dynamic regimes revealed proportionally larger area measurements in the dynamic regime. The foot axis angle measurements obtained in the dynamic regime differed from the values reported in the relevant literature sources. The values of these measurements ranged from –140 to +260 with the mean value of 10. Literature sources analysed reported the foot axis angle of 8.60 to 11.40 in the dynamic regime. 23% of the participants had a decreased medial longitudinal arch height. Grade 1 decrease was observed in 10 participants, grade 2 decrease in 1 participant. There was no correlation between the foot pressure distribution of the participants and the factors influencing foot development, which were mentioned in the questionnaires.

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**PP 12**

## INFLUENCE OF GENDER, BODY MASS INDEX AND AGE ON PATIENT'S FUNCTIONAL STATUS DURING REHABILITATION AFTER KNEE REPLACEMENT SURGERY

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*Intoduction:* One of the most important rehabilitation objectives for patients after knee replacement is improvement of functional status which depends on many factors. To achieve better rehabilitation outcomes it is important to evaluate these factors and their influence. *Aim:* To evaluate the influence of gender, the body mass index and age on patient's functional status during rehabilitation after knee replacement surgery. *Methods:* The study included 70 patients (33% females) after knee replacement surgery because of V° gonartrosis. The data were gathered by interviewing patients, analyzing medical documentation and testing the functional ability (Keitell index), mobility (0–7 points), walking distance. Average age of the patients was 70 ± 7.69 years. The average body mass index was 29.68 ± 5.76. *Results:* After the rehabilitation course all women (100%) were independent and safe in standing up and walking with technical aids. Supervision or verbal corrections in mobility activities were necessary for the men. The observed difference in mobility level was related to age and body mass index. All patients became independent in mobility activities during the rehabilitation, but the older people still needed a contact support for climbing stairs ($p < 0.05$). The average walking distance was similar for the male and female groups at the end of rehabilitation. The overweight patient's walking distance was significantly shorter than patient's with normal weight ($p < 0.05$). Persons younger than 70 years were able to walk longer distance at the end of the rehabilitation than older persons. Lower scores of the modified Keitell index at discharge ($p < 0.05$) were observed in the male group, in persons with higher body mass index and in older age. A correlation was found between the Keitell index, all mobility activities and walked distance, as well as between age, body mass index and climbing stairs ($p < 0.05$). *Conclusion:* Male gender, increased body mass index and older age are negative components for recovery of patients' functional status during rehabilitation after knee replacement surgery.

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## EFFECTS OF BOTULINUM TOXIN A ON UPPER EXTREMITY MOTOR FUNCTION IN STROKE PATIENTS

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*Introduction:* Botulinum toxin A is a neurotoxin which blocks cholinergic transmission at the neuromuscular junction. It can reduce spasticity and improves upper extremity motor function in stroke patients. *Aim:* To determine the effect of botulinum toxin A on upper extremity motor function in chronic spastic hemiplegic stroke patients. *Methods:* A total of 18 patients, who had chronic spastic hemiplegia over 12 months after brain injury, had wrist and finger strength more than poor minus grade were enrolled. Botulinum toxin A 25 IU (Botox®) was injected to flexor carpi radialis, flexor carpi ulnaris, flexor digitorum superficialis and flexor digitorum profundus of hemiplegic arm. Outcome was assessed by manual muscle test for arm strength, dynamometer and pinch gauge for grip and pinch power, modified Ashworth scale (MAS), manual function test (MFT) and CMS10 measuring system for motion analysis at baseline, after 2 weeks, and additional 6 weeks post-injection. *Results:* Eight weeks after injection, grip and pinch power were not significantly increased. MAS was significantly decreased and wrist extension strength, finger extension strength, MFT score were significantly increased ($p < 0.05$). There were significant improvements in the range of motion score of the passive wrist flexion-active extension movement and amplitude of the wrist flexion-extension movement, hand tap, and finger tap motion ($p < 0.05$). *Conclusion:* The botulinum toxin A injection may be an effective treatment method for spasticity and improves upper extremity motor function in chronic spastic hemiplegic patients.

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## THE IMPACT OF DIFFERENT PHYSICAL THERAPY PROGRAMS ON STROKE PATIENTS BALANCE AND FUNCTIONAL INDEPENDENCE

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*Introduction:* Balance disorders in patients after stroke is one of the major factors restricting the patient's daily activities. Research shows that traditional physical therapy is not sufficient to quickly restore the balance but which methods works most effectively and should be widely applied are still in discussion. *Aim:* To evaluate the impact of different physical therapy programs on stroke patients balance and functional independence. *Methods:* Ninety-seven stroke patients participated in the study. The patients were randomized into three groups: control group ($n = 30$), treatment A group ($n = 30$) and treatment B group ($n = 37$). The program lasted 4 weeks and consisted of basic and functional procedures of physical therapy (PT). Patients of all groups received 2 physical therapy procedures per day, each lasting 30–45 min. For patients in the A group 10–15 min during basic PT procedure was applied cycling training using ergometer. Patients of B the group 10–15 min were trained using a platform 'MTD-balance'. Patients of control group got traditional PT procedures for balance training. The study outcomes were measured using Barthel Index (BI), Berg and Tinetti Scales. *Results:* The results showed that patients of all groups had improved in functional independence and balance after 4 weeks training ($p < 0.05$). Being moderately dependent before, the persons after the treatment became only slightly dependent according to Barthel Index. The analysis of the balance showed that before rehabilitation patients in all three groups had high risk

of falls (control group – 16.0 ± 5.1 points, group A – 14.9 ± 4.3 points, group B – 15.5 ± 4.9 points), according to the Tinetti test. After rehabilitation the patient's risk of falls significantly decreased (control group – 22.8 ± 2.4 points, group A – 23.1 ± 2.5 points, group B – 24.3 ± 2.2 points). The comparison of patient's functional independence between the groups after rehabilitation showed no significant difference ($p > 0.05$). Analysis of patient's balance improvement showed that balance of the B group (trained using platform 'MTD-balance') was significantly better than in the control group ($p < 0.05$). *Conclusion:* A 4-week PT programs with additional physical therapy means were more effective than a traditional PT program for balance and functional independence. Improvement of the patients' balance ability using 'balance' platform was greater than using a bicycle ergometer and higher than performing a traditional PT program for balance training.

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## GOAL SETTING PERTAINING TO UPPER AND LOWER LIMB FUNCTION IN POST-STROKE SPASTICITY (PSS) PATIENTS: THE BOTOX® ECONOMIC SPASTICITY TRIAL (BEST) IN SWEDEN

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*Objectives:* To describe rehabilitation treatment goals for Swedish PSS patients, with respect to improving their upper (UL) and lower limb (LL) function, using goal attainment scaling and to present a means to score individually-defined treatment goals. *Methods:* Adults with focal PSS were randomised to BOTOX® (BoNT-A)+standard care (SC) or placebo+SC for up to 2 treatment cycles, followed by an open-label phase up to a total of 52 weeks. Eligible patients were BoNT-A-naïve, demonstrated preserved function in the limb to be treated, and were considered likely to benefit from the intervention. Those with fixed contractures and causes of spasticity other than stroke were excluded. The primary outcome measure was the percentage of patients achieving their principal active functional goal. Patients also set secondary active or passive functional goals. All goals needed to be sufficiently challenging but appropriate and achievable within a patient's rehabilitation programme, and personally meaningful. *Results:* The intent-to-treat population comprised 273 patients; 92 of these were recruited within Sweden. Within this Swedish cohort, 40 patients chose their principal active functional goal concerning UL function. The most common UL principal active functional goals was feeding ($n = 15$), dressing ($n = 7$) and other ($n = 15$), which consisted of a mixture of grasping/reaching/manipulating objects. For the secondary active functional goals associated with UL function ($n = 16$), 2 patients chose goals concerning feeding, 2 concerning dressing and 11 chose other goals. For those patients choosing their principal active functional goal pertaining to LL function ($n = 52$), 42 involved ambulation. For the secondary active functional goals associated with LL function ($n = 24$), 18 patients chose goals concerned with ambulation. For patients selecting secondary passive functional goals ($n = 52$), the most common were relief of pain ($n = 10$) or spasms ($n = 11$) and improved posture ($n = 15$). *Conclusions:* In the Swedish BEST PSS population, most patients selected goals to enhance their LL function, i.e. ambulation. UL functional goals were most often related to feeding and dressing. Most frequent secondary passive goals focused on relief of symptoms such as pain and spasms.

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## ACTIVE AND PASSIVE GOAL ATTAINMENT PERTAINING TO UPPER AND LOWER LIMB FUNCTION IN SWEDISH POST-STROKE SPASTICITY (PSS) PATIENTS: THE BOTOX® ECONOMIC SPASTICITY TRIAL (BEST)

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*Objectives:* To describe rehabilitation treatment goals for Swedish PSS patients, with respect to improving their upper (UL) and lower limb (LL) function, using goal attainment scaling. *Methods:* Adults with focal PSS were randomised to BOTOX® (BoNT-A) + standard care (SC) or placebo + SC for up to 2 treatment cycles, followed by an open-label phase up to a total of 52 weeks. Eligible patients were BoNT-A-naïve, demonstrated preserved function in the limb to be treated, and were considered likely to benefit from the intervention. Those with fixed contractures and causes of spasticity other than stroke were excluded. The primary outcome measure was the percentage of patients achieving their principal active functional goal. Patients also set secondary active or passive functional goals. All goals needed to be sufficiently challenging but appropriate and achievable within a patient's rehabilitation programme, and personally meaningful. *Results:* The intent-to-treat population comprised 273 patients; 92 of these were recruited within Sweden (59% male; mean age: 62 years; median time since stroke: 25 months). For this Swedish cohort, principal functional active goals were achieved by 22 (45.8%) patients receiving BoNT-A + SC and 13 (31.0%) patients receiving placebo + SC. For those patients selecting principal active functional goals relating to UL function ($n = 40$), 9 receiving BoNT-A + SC and 5 receiving placebo + SC achieved these. For those patients selecting principal active functional goals relating to LL function ($n = 52$), 13 receiving BoNT-A + SC and 8 receiving placebo + SC achieved these. A total of 23 (47.9%) patients receiving BoNT-A + SC achieved their secondary functional goals, compared with 19 (45.2%) patients receiving placebo + SC. *Conclusions:* In the Swedish BEST PSS population, the majority of patients chose a principal active functional goal concerned with LL function (mostly ambulation). A higher proportion of patients receiving BoNT-A + SC achieved these goals compared with those receiving placebo + SC. Similar results were obtained for the principal active functional goals when considered separately for UL and LL function. Secondary functional goals were achieved by similar proportions of patients in both treatment arms.

## *MENTAL FUNCTIONS: INTELLECTUAL, ATTENTION, EMOTIONAL*

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### COGNITIVE NEUROREHABILITATION OF ATTENTION IN CHILDREN WITH BRAIN TRAUMA AND EPILEPSY USING THE COMPUTER-ADMINISTERED FORAMENREHAB PROGRAM

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*Introduction:* Mild traumatic brain injury (mTBI) and epilepsy are the two most common pediatric neurological disorders. These disorders are frequently accompanied by attention deficit, thus interfering with further cognitive development. Due to the lack of modern computer-based neurorehabilitation methods for children this study was conducted. *Aim:* The aims of the pilot study were: 1) To elaborate new systemized methods for neurocognitive rehabilitation of attention in a pediatric population. 2) To evaluate the appropriateness of the FORAMENRehab program as a regular cognitive intervention for pediatric out-patients. 3) To compare the effectiveness of rehabilitation in children with focal epilepsy (FE) and mTBI. *Methods:* The intervention study involved eight 9–11-year-old (M = 10.6 ± 1.4) children. Three children were diagnosed with FE, 5 children had suffered from mTBI. Previous neuropsychological testing had revealed attention difficulties in all participants. Neurocognitive training took place during 6 weeks (twice a week). Attention-improving exercises of FORAMENRehab consist of four categories (focused, sustained and complex attention; tracking) with 3 different difficulty levels. Each participant attended 12 individual sessions: at the first session the program was introduced, at the second session the baseline exercises were conducted. During sessions 3–11, the children received individual training according to their personal improvement. At the last session baseline exercises were repeated to investigate the changes. *Results:* We found that attention skills improved in all examined areas: positive dynamics in reaction time was seen and the number of mistakes made declined. Comparison of FE and mTBI patients revealed that the children with epilepsy had notably worse baseline complex attention. The overall improvement was more distinct for mTBI group (29.3 ± 12.3 to 4 ± 5.0 vs 49.7 ± 10.5 to 28 ± 35.7 mistakes). During 10 trainings mTBI children reached more difficult exercises faster than FE children (in sustained attention, complex attention and tracking). *Conclusion:* One hundred percent compliance and the improvement of attention functions proved the validity and suitability of the program for children with mTBI and FE. We discovered that the number of training sessions should be at least 10 (+2 evaluation sessions) and children with epilepsy need longer rehabilitation. For a more precise intervention effectiveness protocol, the study should be replicated with bigger sample.

### PP 16

### ASSESSMENT OF FUNCTIONAL COGNITION FOR PERSONS WITH DEMENTIA

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*Introduction:* Society ages, increasing the number of older people who are diagnosed with dementia (1), that manifests with cognitive disorder. Cognitive disorder affects activities and participation of older people with dementia (3). The Allen model is one of the most frequently used occupational therapy models, when working with persons with cognitive disorders. Routine Task Inventory Expanded (RTI-E) (2, Allen 1989) is an activity analysis assessment, used to assess cognitive abilities in the context of activities of daily living (ADL). None of the Allen batteries assessments have been examined in studies in Latvia. *Aim:* To prepare a Latvian version of the Routine Task Inventory-Expanded and verify in the practice Physical scale – Activities of Daily Living and Community scale – Instrumental Activities of Daily Living. *Methods:* RTI-E was translated into Latvian, and the translation was analyzed to ensure its quality. RTI-E (Physical and Community scales) was used to assess functional cognition in the context of ADL and instrumental ADL. There were two sources of information – persons with dementia and caregiver. *Results:* The Latvian version of RTI-E Physical and Community scales were approbated and verified in practice. PRUP showed good internal consistency both in self reports ($r = 0.767$; $p = 0.001$) and care giver reports ($r = 0.882$, $p = 0.000$). There were found significant difference between Physical Community scales both in self reports ($t = 2.955$; $p = 0.010$) and caregiver ($t = 2.620$; $p = 0.02$) reports. Mean result of PRUP care giver report for persons with dementia is 4.0 (SD 0.85) and it is 4th Allen cognitive level. *Conclusion:* The Latvian version of RTI-E and its manual is prepared and the Physical and Community scales are verified in practice. Both scales are reliable and with good internal consistency. RTI-E is usable in assessment of functional cognition for persons with dementia; using it in occupational therapy will give a chance to assess functional cognition and the impact of cognitive disorders on performance of ADL.

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### RELATION BETWEEN FUNCTIONAL AND EMOTIONAL STATUS FOR PERSONS WITH SCI DURING REHABILITATION

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*Introduction:* Spinal cord injury (SCI) typically leads to severe functional loss and disability. Stressful life events put people at higher risk for depression and anxiety. Functional independence level after the injury may be related to the level of depression and anxiety. *Aim:* To examine relation between functional and emotional status for persons with spinal cord injury during rehabilitation. *Methods:* The study included 40 people after spinal cord injury. The mean age was 36.65 ± 17.36. The patients were on a comprehensive rehabilitation course. Patients were evaluated according to Functional Independence Measurement test and Hospital Anxiety and Depression scale. *Results:* Forty percent of SCI patients started rehabilitation having clinically significant anxiety level (mean score 10.00; SD 2.11) and 20% had clinically significant depression level (mean score 10.20; SD 3.83). At the beginning of the rehabilitation course mean score of FIM was 63.52 (SD 21,85). During the rehabilitation level of anxiety and depression decreased, independence level increased. At the end of rehabilitation 20% of SCI patients had clinically significant anxiety level (mean score 9.4; SD 1.14) and 16% had clinically significant depression level (mean score 11.25; SD 3.77). The mean score of FIM at the end of rehabilitation was 82.92 (SD 22.25). The changes were statistically significant ($p \leq 0.01$). At the beginning of rehabilitation there were no statistically significant correlations between independence level (FIM) and anxiety ($r = -0.374$; $p > 0.05$) or depression ($r = -0.167$; $p > 0.05$) scores. At the end of rehabilitation statistically significant correlations between independence level (FIM) and anxiety ($r = -0.407$; $p \leq 0.01$) or depression ($r = -0.464$; $p \leq 0.01$) scores were found. *Conclusions:*

There are no relation between functional and emotional status of persons with spinal cord injury at the beginning of rehabilitation. The absence of depression and anxiety could be due to a denial defence mechanism. However, at the end of rehabilitation there are a relation between functional and emotional status of patients with SCI.

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## *MENTAL FUNCTIONS: INTELLECTUAL, ATTENTION, EMOTIONAL*

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### CALF MUSCLES DYSFUNCTION IN STROKE PATIENTS AT THE CHRONIC STAGE REVEALED BY VELOCITY-ENCODED PHASE-CONTRAST MRI

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*Introduction:* Velocity encoded cine phase contrast MRI (VE-PC MRI) can provide a new assessment for the muscle function in patients with hemiplegia *in vivo*. What will be found about calf muscles contraction during ankle movement. *Aim:* To explore the muscles dynamic characteristics during ankle dorsiflexion and plantarflexion in stroke patients at a chronic stage. *Methods:* Twenty-six stroke patients and twenty-one age- and sex-matched normal controls were involved in this study. Subjects were positioned on the scanner table and did ankle flexion-extension voluntary movement. The velocity encoded phase contrast magnetic resonance image provided images of the tibialis anterior muscle (TA), the medial head of gastrocnemius muscle (MG) and the soleus muscle (SOL) during a movement cycle. To calculate the calf muscles contraction peak velocity to the proximal direction, the balance function was assessed by Berg balance scale in the patients. The correlation between scores of Berg balance scale and the mean maximum velocity were analyzed. *Results:* The peak velocity of TA (8.90–21.120 mm/s vs 12.99–34.5 mm/s), MG (13.60–13.28 mm/s vs 25.85–18.38 mm/s) and SOL 18.63–33.62 mm/s vs 27.68–47.22 mm/s) in the affected side was lower than controls during ankle extension $p < 0.05$. During ankle dorsiflexion, the co-contraction index of SOL/TA (0.81–0.82 vs 0.27–0.44), and the co-contraction index of GM/TA (0.73–0.58 vs 0.10–0.11) were significantly higher in the affected side than controls. The scores of BBS were significantly negatively correlated with the mean velocity of TA ($r = –0.69$, $p = 0.001$) and GM ($r = –0.47$, $p = 0.01$) in the affected side. There was a negative correlation between the scores of BBS and TA ($r = –0.60$, $p = 0.001$), GM ($r = –0.49$, $p = 0.01$) in the unaffected side. *Conclusion:* During active ankle flexion-extension movement cycle, the contract function of TA, SOL and MG in the affected side are lower in stroke patients. There is abnormal co-contraction in the affected side during ankle dorsiflexion and decreased balance function in stroke patients. Calf muscles should be enhanced during rehabilitation training. VE-PC MRI can provide activity messages of calf muscle *in vivo*, can be used to evaluate muscles function post-stroke and provide a basis for efficient therapy.

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### CONTRACTILE FUNCTION OF THIGH MUSCLES' EFFECTS ON BALANCE FUNCTION IN STROKE PATIENTS

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*Introduction:* Stroke patients have poor balance. Thigh muscles activities play an important role for balance in stroke patients. How do thigh muscles affect the balance? *Aim:* To explore the relationship between the features of surface electromyography (sEMG) of the thigh muscles and balance in stroke patients, to provide better rehabilitation plans for stroke patients. *Methods:* Twenty-one stroke patients and eighteen age-and sex-matched normal controls were involved in this study. The sEMG of vastus medialis (VM), rectus femoris (RF), vastus lateralis (RL), biceps feomris (BF) were recorded during maximum voluntary isometric contraction (MVC) of knee extension and flexion. Root mean square (RMS) and co-contraction ratio (CR) of both groups were compared and analyzed. The balance of stroke patients was assessed by the Berg balance scale (BBS) at the same time. *Results:* During MVC of knee extension and flexion, there were significant differences in RMS of VM, RF,VL and BF ($137 \pm 63$, $107 \pm 24$, $154 \pm 19$, $91 \pm 62$ μV) on the affected side ($p < 0.05$, the CR of the affected side was higher than the unaffected ($43 \pm 13$ vs $37 \pm 12\%$, $p < 0.05$), and similiar results were found between the affected thigh and the controls ($43 \pm 13$ vs $32 \pm 10\%$, $p < 0.05$). The RMS of RF and BF of the affected thigh were significantly positively correlated with the score of BBS (rRF = 0.53, $p = 0.01$, rBF = 0.51, $p = 0.02$) respectively; the CR of knee extension and flexion in the affected was significantly negative correlation with the score of BBS (CRE = –0.59, $p = 0.005$ vs CRF = –0.41, $p = 0.046$). *Conclusion:* Bilateral thigh muscle contraction decreased in stroke patients and thigh extensor spasticity still exist. In addition to inhibiting hemiplegic extensor spasticity on the affected side, rehabilitation should also focus on bilateral thigh muscles strength, especially ipsilateral RF and BF strength training to improve balance.

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### FEATURES OF SURFACE ELECTROMYOGRAPHIC SIGNALS OF THIGH MUSCLE IN STROKE PATIENTS

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*Introduction:* In a previous study, lower limb muscle function in stroke patients were studied using a more general assessment by torque measurement. But this method can only give information about certain muscle groups. In this study, a multi-channel surface EMG will be used for measurement of thigh muscle contraction in stroke patients, in order to obtain single muscle contraction data. *Aim:* To explore the features of the surface electromyography (sEMG) signal of the thigh muscle in stroke patients and to provide objective data for thigh muscle's functional assessment. *Methods:* Twenty-eight stroke patients and twenty age- and sex-matched normal controls were involved in the study. During maximal voluntary contraction (MVC) of knee extensors and flexors, the signals of surface electromyography of vastus medialis (VM), rectus femoris (RF), vastus lateralis (RL), biceps femoris (BF) from affected limbs (AL), unaffected limbs (UAL) and left limbs of the controls (CTRL) were recorded. MVC force of knee extension and flexion was measured at the same time. Integrated EMG (iEMG) and co-contraction ratio

(CR) of both groups were analyzed by the sEMG. *Results:* During knee extension, there were significant differences in iEMG of VM (AL 45.92 ± 29.47, 58.21 ± 36.56, 91.28 ± 53.49, RF (AL 42.26 ± 24.13, UAL 60.40 ± 17.97, CTRL 77.79 ± 28.34, $p < 0.05$) and VL (AL 52.50 ± 19.21 UAL 82.27 ± 30.17, CTRL 94.60 ± 39.65, $p < 0.05$). There were significant differences in iEMG of BF (AL 48.32 ± 24.23 UAL 76.88 ± 29.54, CTRL 87.94 ± 59.74, $p < 0.05$) during knee flexion. There was a significant increase in CR on AL compared to UAL and CTRL (AL 0.18 ± 0.12, UAL 0.12 ± 0.44, CTRL 0.10 ± 0.05, $p < 0.05$) during knee extension ($p < 0.05$). Force torque of the AL was less than UAL and controls during knee extension (AL 38.67 ± 16.42, UAL 44.64 ± 21.78, CTRL 57.38 ± 17.93, $p < 0.05$) and flexion (AL 16.46 ± 6.53, UAL 19.57 ± 1.58, CTRL 21.70 ± 1.58, $p < 0.05$). *Conclusion:* Muscle strength decreases and CR increases on the paretic lower limb and it may play an important role in stroke patient's functional rehabilitation. Therapy plans should be focused on strength training and restraining the abnormal muscles contractions.

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## EFFECTS OF REHABILITATION TRAINING ON LOWER EXTREMITY MUSCLE FUNCTION IN CHRONIC STROKE PATIENTS REVEALED BY VELOCITY-ENCODED PHASE-CONTRAST MRI

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*Introduction:* Velocity-encoded cine phase contrast MRI (VE-PC MRI) is a combination of Cine MRI and phase-contrast MRI techniques, is useful for assessing in vivo function of both superficial and deep muscles. *Aim:* By means of velocity-encoded phase-contrast MRI, assess the effects of rehabilitation training on lower extremity muscle function in chronic stroke patients. *Methods:* 29 chronic stroke patients were divided into treatment group and control group. Subjects were in supine position on the scanner bed and did ankle flexion-extension voluntary movements. Data were collected from affected lower extremities tibialis anterior muscle (TA), gastrocnemius medial head (MG) and soleus muscle (SOL). The treatment group received rehabilitation including lower extremity strength training, and the control group received general therapy except lower extremity strength training. Calf muscle contraction speed were measured before and after treatment of the subjects, Berg balance scale (BBS) and other data were analyzed and compared. *Results:* Except two subjects, the other patients completed the follow-up. Compared with baseline, the treatment group increased velocity in TA (phase 2–7, 17.45 ± 7.28–38.51 ± 8.20 vs 12.30 ± 5.43–30.43 ± 9.30, $p < 0.05$), MG (12–18 phase, 22.88 ± 11.55–27.96 ± 12.99 vs 13. ± 7.87–18.81 ± 7.53, $p < 0.05$), and SOL (13–16 phase, 34.57 ± 15.78–40.61 ± 17.74 vs 24.43 ± 12.62–31.53 ± 15.17, $p < 0.05$) during active muscle contraction (increase statistically significant, $p < 0.05$). The control groups' contraction velocity of the calf muscles improved too, but the significant improvement was less than in the treatment group, TA (4-phase, 38.34 ± 14.51 vs 28.09 ± 8.56, $p < 0.05$), MG (13–15 phase, 27.13 ± 11.67–41.64 ± 13.31 vs 19.06 ± 10.02–30.15 ± 10.59, $p < 0.05$), SOL (15 phase, 17.45 ± 7.28 vs 30.43 ± 9.30, $p < 0.05$). BBS scores of the two groups were significantly improved compared with baseline. (BBS treatment group: 51.85 ± 2.91 vs 48.53 ± 2.61, BBS control group: 53.07 ± 2.97 vs 47.57 ± 4.14, $p < 0.05$). *Conclusion:* Strength training can improve calf muscle contractions on the affected side in stroke patients. VE-PC MRI techniques can provide specific assessment of contractile function of calf muscles in post-stroke patients.

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## EFFECTS OF STRENGTH TRAINING ON THIGH MUSCLES IN CHRONIC STROKE PATIENTS REVEALED BY SURFACE ELECTROMYOGRAPHY

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*Introduction:* Strength training is a controversial topic in stroke patients. It is well known that strength training can increase the unaffected limb's muscle strength in patients, but at the same time, would the abnormal contraction be strengthened too in the stroke patients? *Aim:* To explore effects of strength training on thigh muscles in stroke patients revealed by surface electromyography, and contribute to an objective basis for strength training rehabilitation. *Methods:* Thirty-five chronic stroke patients were involved in this study. Subjects were divided into two groups, a treatment group and a control group. The treatment group received a strength training program (climbing and resistance exercises) for 6 weeks, the control group did not receive strength training besides routine exercise. At baseline and follow-up, the signals of surface electromyography of vastus medialis (VM), rectus femoris (RF), vastus lateralis (VL), biceps feomris (BF) and semitendinosus (ST) were recorded during knee extension and flexion maximum voluntary isometric contraction on the affected side. Root mean square (RMS) and co-contraction ratio (CR) of the affected knee muscles were analyzed and compared. Barthel index was used to assess ADL. *Results:* After training, there were significant improvment in RMS of RF (97.02 ± 57.17 vs 146.60 ± 60.85 μV, $p = 0.001$) and VL (131.46 ± 52.15 vs 172.65 ± 60.73, $p = 0.005$) on the affected side during knee extension ($p < 0.05$). There were significant improvement in RMS of ST (130.57 ± 73.76 vs 188.69 ± 89.6, $p = 0.02$) on the affected side during knee flexion. In the treatment group, there were no significant differences in CR during knee extension (0.19 ± 0.12 vs 0.15 ± 0.06, $p = 0.127$) and flexion (0.21 ± 0.10 vs 0.19 ± 0.08, $p = 0.515$) between baseline and follow-up. Barthel index were increased in both groups during follow-up (Barther 89.68 ± 4.34 vs 76.26 ± 4.41, $p = 0.001$; Barcon 82.58 ± 2.91 vs 77.05 ± 3.42, $p = 0.01$). *Conclusions:* Strength training improves thigh muscles' contraction function without concomitant increase in CR in the affected thigh muscles of stroke patients, and it is an effective method to improve ADL abilities in chronic stroke patients.

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## NORMAL CALF MUSCLE CONTRACTILE FUNCTION IN VIVO USING VE-PC MRI DURING ANKLE FLEXION AND EXTENSION MOVEMENTS

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*Introduction:* Velocity encoded phase contrast magnetic resonance imaging (velocity encoded phase contrast MRI, VE-PC MRI) techniques is a novel assessment techniques in vivo, to evaluate the contraction velocity and direction information of a muscle. Are calf muscles' contraction velocity decreased in elderly people during an ankle flexion and extension movement? Are calf muscles' contraction mode changed? These issues are important for arranging appropriate exercise programs to help the elderly. *Aim:* By means of velocity encoded phase contrast magnetic resonance imaging techniques study the biomechanical characteristics of the calf muscle *in vivo* in normal people. *Methods:* Twenty-four healthy subjects were devided into a young group (30–40 years) and an elderly group

(≥60 years). All subjects took a supine position in the magnetic resonance table with the ankle joint active flexion and extension cycles. The VE-PC MRI techniques were used to collect the left leg tibialis anterior muscles (TA), gastrocnemius medial head (MG) and soleus (SOL) of the move image. By software analysis of contraction speed of the calf muscles, the subjects were compared with characteristics of the muscle contraction *in vivo*. *Results:* During the ankle flexion and extension, during the dorsiflexion phase, TA showed the largest contraction velocity of the two groups, acting as concentric contraction; contraction velocity of MG was greater than SOL during the dorsiflexion phase and the MG value was greater than the speed of SOL during plantar flexion phase. In the youth group, contraction velocity of TA, MG and SOL muscle was greater than the contraction velocity of elderly patients ($p < 0.05$). *Conclusion:* During cyclic ankle flexion and extension, the TA, MG and SOL of the older group have decreased contraction function compared to the younger group. Particularly these muscles contract as active muscles. The VE-PC MRI technique may reflect the biomechanical characteristics of calf muscles *in vivo* and provide a new evaluation methods.

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## ELECTROMYOGRAPHIC ANALYSIS OF THE STERNOCLEIDOMASTOIDEUS MUSCLE DURING DYNAMIC HEAD MOVEMENTS

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*Introduction:* The sternocleidomastoideus muscle (SCM) has two distinct parts: a sternal and clavicular part. It has been reported that each part may present a separate contraction, but this function is not shown. *Aim:* To determine the action of the belly, the sternal and clavicular parts of the SCM during voluntary dynamic movements of the head, using a digital system of surface electromyography. *Methods:* Ten volunteers (5 male and 5 female) aged 18–40 years were selected. Three pairs of electrodes were positioned on the muscle belly, the sternal and clavicular parts of both SCM (right and left sides). Each volunteer performed head dynamic movements (flexion, extension, rotation, inclination, rotation combined with inclination). Electromyographic signals were captured using active differential surface electrodes and recordings were made on a 12-channel equipment of simultaneous EMG signal acquisition. The analog EMG signal was digitized using a 12 bit A/D converter at a sampling rate of 4 kHz. The signal was filtered by a digital pass-band of 10-500 Hz and specific software was used to visualize and to process the EMG signal. Statistical analysis : Kruskal-Wallis with Dunn post-hoc test, Mann-Whitney test, with $p < 0.05$. *Results:* The SCM sternal and clavicular parts presented significantly higher electric activity than its muscle belly in the flexion movement on both sides, while the clavicular part was the most active in the extension movement. In the single rotation movement, the muscle belly and the sternal part showed the greatest activity, while in the inclination movement the three SCM parts acted equally. In the combined movement (rotation with inclination) toward the right side, the SCM muscle belly and the sternal part of the left side showed significantly higher EMG activity than its clavicular part. The same was observed for the movement toward the left side. *Conclusion:* There are separate activations/contractions of the SCM muscle belly, the sternal and clavicular parts. The rotation component of the SCM sternal part is higher than that of the clavicular part.

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## ELECTROMYOGRAPHIC ACTIVITY OF THE TIBIALIS ANTERIOR MUSCLE IN DIFFERENT PROPRIOCEPTIVE EXERCISES

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*Introduction:* Proprioception is used to describe all the neural information originated from the proprioceptors of the joints, muscles, tendons, ligaments and capsules, which are sent afferent pathways to the central nervous system. The changes in the myoeletrical characteristic of the muscle activity can be identified through the surface electromyography (EMG), providing important informations about the muscle behavior which are submitted to several types of overload. *Aim:* To evaluate the electromyographic activity of the tibialis anterior muscle in different proprioceptive exercises with the use of equipment balancin (levels 1 and 2) and freeman disc. *Methods:* Ten healthy adult males were selected for this research. Data collection was performed using the active differential surface electrodes (gain of 20 times), recorded in a computer-connected electromyography and expressed in numeric values of RMS (root mean square), which were normalized (RMSn) through the maximum voluntary isometric contraction. The obtained data were submitted to the parametric statistical analysis using ANOVA. *Results:* The main results revealed no significant differences ($p > 0.05$) in mean RMS of the tibialis anterior muscle during exercise execution level 1 balancin (28.59), level 2 balancin (27.09) and freeman disk (30.25). *Conclusions:* The different devices used, produced similar electrical activity in the tibialis anterior muscle. However, the most difficult degree of exercise was observed in the use of the freeman disk due to its instability, and despite that it did not present a significant increase in EMG activity. Further studies are necessary to evaluate different variables that influence the effect of proprioceptive training on the electromyographic activity, to increase the scientific knowledge about activation of ankle muscles when performing various proprioceptive exercises, thus contributing to the training field aiming at a physiotherapy treatment protocol for ankle injuries.

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## CHARACTERIZATION OF MUSCULAR FATIGUE AND BITE FORCE THROUGH ELECTROMYOGRAPHIC ANALYSIS IN INDIVIDUALS WITH PAIN DUE TO TEMPOROMANDIBULAR DYSFUNCTION

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*Introduction:* Most patients with temporomandibular disorder exhibit musculoskeletal abnormalities that cause pain and muscle fatigue. The disorders are more prevalent among women. The framework is manifested by a wide variety of symptoms and their etiology is multifactorial, which makes diagnostic and therapeutic practice complicated. *Aim:* To analyze muscular fatigue levels, bite force, pain tolerance limit and myoelectric activity of chewing muscles in women with and without temporomandibular dysfunction. *Methods:* A group of 39 women ranging from 18 to 42 years old, presenting temporomandibular dysfunction, and a control group of 19 asymptomatic women were electromyographically evaluated, being all volunteers with full dentate up to the second molar teeth. After quantifying the pain tolerance limit by means of a digital algometer, one determined the maximum bite force by means of a digital arch gnatodynamometer placed among the teeth. Bilaterally, the anterior part of the temporal and the masseter muscle were evaluated by single active electrodes coupled to a signal acquisition module of Data Homminis Inc. The reference electrode was placed over the ulnar styloid process. Three evaluations, 3-min interposed, were made at rest and at maximum bite force. The latter was maintained with the aid of a sonorous feedback emitted by the electromyograph. During each evaluation, the pain intensity was recorded by means of an algometer, with a manual button indicating the Analogical Visual Scale monitored by the volunteer. The equipments were coupled to auxiliary channels of the electromyograph. An Analysis of Variance statistical test was employed. *Results:* The two groups did not undergo significant differences concerning muscular fatigue but indeed these were demonstrated in relation to bite force, pain tolerance limit and myoelectric activity. *Conclusion:* Although muscular fatigue was not a difference-indicator for the groups, the study shows that pain jeopardizes the muscular kinesiology of chewing.

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## ASSESSMENT OF ACUTE PAIN AND BIOMECHANICS THROUGH AND AFTER PRE AND POST ELECTROMYOGRAPHIC OCCLUSAL ADJUSTMENT – A PILOT STUDY

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*Introduction:* The adjustments that change the traditional position of the jaw may be the result of the direction of muscular work when performed differently than normal. Knowledge of biomechanics collaborates with the identification of occlusal imbalances that drive the placement of the jaw, changing the working muscle related directly or indirectly with it. *Aim:* 1) to assess the variability of EMG activity before and after Occlusal Adjustment Function (OAF) at maximum voluntary contraction, swallowing and chewing in the right masseter (RM) and left (LM) and right sternocleidomastoid (RS) and left (LS); 2) to assess pain by visual analogic scale (VAS) before and after OAF. *Methods:* A female patient was selected, angle class I with all the teeth, with a chief complaint of myofascial pain (pain in the left masseter) and difficulty in swallowing, who reported having undergone restorative treatment of posterior teeth (second molar right), showing an unbalanced feeling when biting as a touch premature with respect to the left. The patient was treated based on knowledge of the relationship between occlusal anatomy and biomechanics of occlusion, for performing the adjustments. *Results:* Muscle LM had a 69% improvement in chewing, swallowing 73% and 42% in post OAF isometry with respect to pre-measurements. In the same activities, the masseter muscles achieved an improvement in symmetry (balance of contraction between the right and left side) in approximately 98%. Pain decreased by 60% in RM, 90% in LM, 81% in RS and 87% in LS. *Conclusion:* Functional Occlusal Adjustment, which links the dental anatomy to the work of muscles of head and neck may be an effective alternative treatment to resolve imbalances and muscular discomforts, but randomized studies are needed with larger populations.

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## PAIN AND MUSCLE ACTIVITY EVALUATION IN AN ORTHODONTIC SURGICAL PATIENT TREATED WITH OCCLUSAL ADJUSTMENT – A CLINICAL REPORT

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*Introduction:* The complexity of the afferent and efferent systems of motor and sensory nuclei of trigeminal and facial nerves, show that they do not only relate to their territory of innervation of the branches, also linking with cranial and cervical nerves. The orthodontic-surgical treatment is an invasive treatment that can change the occlusal equilibrium, and the adaptation to the new muscular biomechanics can cause imbalance of forces and orofacial pain. *Aim:* To evaluate the effect of occlusal adjustment on electromyographic activity and perception of pain symptoms before and after occlusal adjustment. *Methods:* A female, 37 years old, Class II Angle – skeletal, with chronic temporomandibular disorder and constant head pain for over two years, and who underwent surgical-orthodontic treatment twice because of relapse treatment. Electromyographic examination evaluated temporal and masseter muscles bilaterally at rest, isotonics and isometrics, during a time of 5 s. For the assessment of pain an analogue scale of pain (VAS) was applied. *Results:* Soon after occlusal adjustment the EMG assessment indicated a decrease of EMG activity in muscles during mandibular movements. The pain sensitivity assessed by VAS was reduced after occlusal adjustment. *Conclusion:* There are EMG changes and neuromuscular adaptations after occlusal adjustment. In addition, other factors may be related, as the relation-jaw posture and occlusal force.

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## ELECTROMYOGRAPHIC EVALUATION OF UPPER LIMB MUSCLES IN MEN UNDERGOING CREATINE SUPPLEMENTATION

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*Introduction:* Surface electromyography is a potential tool for anatomic, clinical and kinesiologic studies of muscle electric activity and it has been employed to identify muscular activation levels associated with muscular fatigue. Creatine supplementation has been used to augment the muscular efficiency as well as to decrease the onset of muscular fatigue. *Aim:* To analyze the electromyographic activity of biceps brachii (BB), brachioradialis (BR) and flexor carpi ulnaris (FCU) muscles in subjects submitted to acute and chronic creatine supplementation. *Methods:* Twenty resistance-trained male volunteers, aged 18–35 years, were selected for this double-blind, placebo controlled, randomized study. Volunteers were placed into two groups: creatine (5 g creatine + 5 g maltodextrine, $n = 10$) and placebo (5 g cellulose + 5 g maltodextrine, $n = 10$). Oral supplementation was given 4 times per day during the first 7 days and once a day in the 49 subsequent days. Volunteers performed maximum isometric voluntary contraction (MIVC) of forearm flexion and with 30% and 60% MIVC, before and after 7 and 56 days of supplementation. Electromyographic signs were captured and analyzed by the Myosystem-Br1 software. A load cell was used to measure the maximum isometric strength. Electromyographic data were calculated by RMS (root mean square), median frequency (MF) and analyzed by linear regression curve, generating RMS and MF slopes that were considered muscular efficiency and fatigue indices, respectively. *Results:* BB and BR muscles showed a decrease of RMS slopes after 7 and 56 days of creatine supplementation with 60% MIVC ($p < 0.05$). No significant difference was observed in MF slopes among times of supplementation for all muscles in both loads and groups. *Conclusion:* Isometric strength in elbow flexion was increased after prolonged creatine supplementation. Short-time or prolonged creatine supplementation has no beneficial effect on reducing muscular fatigue of BB, BR and FCU, whichever the load, except possibly BB and BR muscular efficiency only with high load.

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## EVALUATION OF ISOKINETIC TRAININGS' INFLUENCE ON THIGH MUSCLE CHARACTERISTICS

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*Introduction:* Muscles are extremely sensitive to stress and respond in a specific manner. The response of muscles varies according to the type of training and to the intensity of the loads applied. By using sophisticated equipment it is possible to set-up exercises customized according to the age, sex, pathology and to define the best training for the muscular structures at a specific time frame of the athletic project. *Aim:* To evaluate isokinetic training influence on thigh muscle characteristics. *Methods:* The study group comprised of 16 females (age range 22.75 ± 2.8 years) second–third year physiotherapy students. During 3 months, 2 times per week the students participated in isokinetic resistance training of leg muscles. Muscular strength and endurance were measured according to a standard protocol using an isokinetic dinamometer (Gymnex Iso-1). Muscle tone and recovery time were measured using the Myoton-3 myometer. Data were collected at two intervals over a 3-months period, including baseline and post-training. *Results:* The students mean height was 1.67 m (SD 5.7), mean body mass 58.g (SD 11.4), mean BMI 20.9 kg/m² (SD 3.1). Significant gains in muscular endurance of knee flexors and extensors were found between baseline and post-training in both tested legs. Left knee extensors endurance increased 9.5%, right 6.8%, meanwhile endurance of knee flexors increased on the left 18.9%, and right 16.7% ($p < 0.05$). Muscular strength significantly increased in knee flexors in both legs: left 11.8%, right 12.3% ($p < 0.05$), meanwhile no significant gains were found in knee extensors ($p > 0.05$). Muscle tone of knee flexors and extensors decreased after isokinetic resistance training, but no significant gains were found ($p > 0.05$). Significant gains were found by comparing muscle tone recovery curves between baseline and post-training periods ($p < 0.05$). *Conclusions:* After isokinetic training, muscle strength and endurance increase significantly and it take less time for muscles to recover after training, meanwhile muscle tone decreases in healthy female physiotherapy students.

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## PHYSICAL ACTIVITY AND PHYSICAL FITNESS EVALUATION OF PHYSIOTHERAPY STUDENTS OF VILNIUS UNIVERSITY MEDICAL FACULTY

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*Introduction:* Physical activity is one of the most important components of healthy lifestyle. Physical activity of young people is insufficient. As research show, physically active students appreciate their health and take more attention to their health. Most students do not have basis on physical self-development and do not spare enough time to physical exercises. Physiotherapy students are taught the principles of fitness at the university but many of them are not engaged in health promotion behaviours. *Aim:* To evaluate physical activity and physical fitness of physiotherapy students of Vilnius University Medical Faculty. *Methods:* The study group comprised 135 female (age range 20 ± 0.18 years) physiotherapy students of course I–IV of Vilnius University Medical Faculty. The data about physical activity in daily life was gathered by a questionnaire. 65 students were evaluated using Eurofit tests. *Results:* At the time of interview, only 36.3% of the students had physical activities on regular basis. The main factor preventing the respondents from participation on a regular basis was the lack of free time. According to 22.5% of the respondents, sport was too expensive for them.

78.5% of the respondents would like to have physical training during study time. 24.3% of the students would choose training in swimming pool, 30.7% aerobic training. According to the Rufje index 69.2% of the students endurance was poor and very poor. In 23.1% of the students their abdominal muscles' dynamic strength was evaluated as poor. 87.7% of the students had good balance. In 81.5% of the students maximal strength of leg muscles was evaluated as poor. *Conclusions:* Although physiotherapy students are taught the benefits of regular physical activity, they have difficulties in finding time to participate in physical activities. Physical fitness is insufficient for most of the students. Students should be physically active to improve their physical and functional capacity.

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## HETEROTOPIC OSSIFICATION OF THE QUADRATUS LUMBORUM AND ERECTOR SPINAE IN A SPINAL CORD INJURED PATIENT

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*Introduction and Aim:* Heterotopic ossification (HO) is the development of bone in abnormal areas, usually in soft tissues. HO may occur anywhere in the body but is most frequently found at the joints or long bones. In spinal cord injured (SCI) patients, it will always occur below the level of injury and most commonly found around the hips, followed by the knees, shoulders and sometimes in the paravertebral area. But, HO in quadratus lumborum and erector spinae muscle is a rare condition and only reported in one case. *Methods:* A 45-year-old male patient with C5 incomplete tetraplegia (ASIA B) presented at the out-patient department with protruded mass on his right back area. The patient was tetraplegic due to a cervical spinal cord injury from a motor vehicle accident 5 month ago. On physical examination there was a solid protruding mass on his right back. There was no redness or swelling around the mass area. *Results:* On the laboratory findings, serum alkaline phosphatase was 711 IU/l (normal range 104–338), C reactive protein was 10.69 mg/l (normal range 0–5) and erythrocyte sedimentation rate was 23 mm/hr (normal range 0–10). A plain radiography of showed scattered amorphous dense and slightly increased radioopacity of both hips. A radiography of the lumbar spine showed a dense calcification area of the right anterior superior iliac spine area. Bone scintigraphy revealed intense increased uptake in right paravertebral area and right femoral area. Magnetic resonance imaging showed a 6 cm × 14 cm longitudinal HO at right quadratus lumborum and erector spinae muscles at the lumbar spine level. *Conclusion:* The patient was treated with etidronate disodium, a non-steroidal anti-inflammatory drug and conservative treatment. Although HO is not uncommon in SCI patients, HO of the quadratus lumborum and erector spinae muscles are rarely reported. We report our experience of a case of HO at skeletal muscles and follow-up of natural course of the patient.

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## PHYSICAL FITNESS AMONG 25 TO 35 YEARS OLD VISITORS OF DANCE AEROBICS AND OF GYM

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*Introduction:* Nowadays, because of the development of technologies in the world and also in Latvia, the physical load diminishes while the psychological load grows. In Western Europe almost two thirds of grown-ups are not physically active enough and the level of activity continues to descend. To offer the best consult about suitable physical activities that are appropriate for ones physical fitness, it is important to estimate the level of patient's physical activity. *Aim:* To measure and analyze physical fitness among 25–35-year-old dance aerobics and gym visitors and women who do not take part in any physical activities, using the Eurofit test. *Methods:* Sixty women took part in this study. The author assessed 20 dance aerobics and 20 gym visitors, who have been attending dance aerobics or gym at least twice a weak in a period of time of six months, as well as 20 women who did not take part in any physical activities. To define the results the Eurofit Physical Fitness Test was used. *Results and Conclusions:* The best results of the physical fitness tests for aerobics visitors were in the equilibrioception test 0.4 ± 0.5 times; speed of arms test 11.9 ± 1.6 s; flexibility tests 32.1 ± 4.9 cm, shoulder movement spectrum test 180 degrees; hip movement spectrum test 54.6 ± 5.3 degrees. Visitors of gym showed best results in explosive power defining tests 36.4 ± 5.4 cm, static power defining tests 19.5 ± 3.1 kg and functional power defining test 20.2 ± 7.7 s. In the body power test, gym and dance aerobics visitors showed equal results of 15 times. The results in all tests were lower for the control group. The visitors of dance aerobics had better equilibrioception, flexibility and speed, but gym visitors better power.

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## ANTHROPOMETRIC PARAMETERS OF 16–25 YEARS OLD SPRINT KAYAKERS

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*Introduction:* Several hundreds of Latvian youth are involved in kayaking as leisure-time entertainment or sporting event. Investigation of anthropometrical parameters and their relation to the performance in sprint distance is valuable not only for the development of training programs and team selection, but also to produce better performance in the future, predicting the risks of injury, as well as creating data bases, which can also be used for future research. *Aim:* To investigate anthropometric parameters of Latvian kayakers and the relationship of these parameters with performance at K-1,200 m distance. *Methods:* This study included 20 male Latvian kayakers (mean age 19.15 years), who had participated in a Latvian championship of sprint canoeing. All participants answered a questionnaire and agreed to anthropometric measurements. Standing height, sitting height, body mass, body mass index, arm length and arm circumference at flexed and relaxed state was measured. To determine the relationships between the anthropometric parameters and the results obtained by K-1,200 m distance, Pearson correlations were used. *Results:* A significant correlation between sitting height and K-1,200 m performance times was found ($p < 0.05$). A significant correlation with K-1,200 m time was found for the body weight ($p < 0.01$) and upper arm circumference of both relaxed ($p < 0.01$) and flexed state ($p < 0.01$). *Conclusion:* The results of this study are similar to studies obtained previously, and data can be used in future research, as well as data bases. Physical therapists should pay more attention to sports injuries preventive activities for those athletes, whose anthropometric parameters are larger.

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## CARDIOVASCULAR AND RESPIRATORY FUNCTIONS. EXERCISE TOLERANCE.

### PP 36

### CARDIORESPIRATORY PARAMETERS OF EXERCISE CAPACITY OF HEALTHY ADULTS AGED 40 TO 60 YEARS

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*Introduction:* The prevalence of cardiovascular mortality in Lithuania is one of the highest among European countries. *Aim:* The main objective of our study was to examine cardiorespiratory parameters of healthy adults aged 40–60 years. At this age the risk for cardiovascular events increases greatly. *Methods:* Progressive incremental exercise test on the cycle ergometer was performed to 53 healthy adults aged from 40–60 years, which were randomly selected from the general public. Main cardiorespiratory capacity parameters analyzed were peak oxygen consumption ($VO_{2peak}$), ventilatory anaerobic threshold ($V_{AT}$), peak heart rate ($HR_{peak}$), maximal ventilation ($VE_{max}$). *Results:* The average measured $VO_{2peak}$ was $32.77 \pm 5.32$ ml kg$^{-1}$ min$^{-1}$ for men and $27.38 \pm 3.20$ ml kg$^{-1}$ min$^{-1}$ for women. Referring to the extensive cardiorespiratory fitness normative values provided by Cooper Institute (Dallas, TX), all men and women in our study over age 40 fell below 20$^{th}$ percentile, which is considered as a poor cardiorespiratory fitness. Ventilatory anaerobic threshold (VAT) was 58.6% of $VO_{2peak}$ (SD 15.1) for men and 64.1% of $VO_{2peak}$ (SD 11.8) for women, with no significant difference between both sexes. Peak ventilation achieved by men was 87.6 l min$^{-1}$ (SD 18.3) and 64.1 l min$^{-1}$ (SD 14.1) by women and were significantly different ($p < 0.001$) between both sexes. *Conclusion:* Our results confirm that aerobic fitness parameters for healthy adults over 40 years of age in Lithuania fall below average, which might be associated with increased prevalence of cardiovascular pathology in this particular population.

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### CARDIOVASCULAR RISK FACTOR MODIFICATION OF PATIENTS WHO HAVE EXPERIENCED FIRST-TIME MYOCARDIAL INFARCTION

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*Introduction:* Cardiovascular disease is the leading cause of death in Europe and in Latvia. Coronary heart disease accounts for half of these deaths (1). Cardiovascular risk factors are associated with an increased risk of developing cardiovascular disease. More than 90% of these risk factors are modifiable. Therefore, it is important to make not only primary but also secondary prevention (2). *Aim:* To analyze the cardiovascular risk factor modification of patients who had experienced first – time myocardial infarction by means of educational recommendations. *Methods:* The study included 23 participants aged 45–75 years. Participants were selected by a purpose sampling method. Questionnaire, anthropometrical assessment (weight, height, waist circumference, body mass index (BMI)), laboratory measurements (total cholesterol (TH), triglycerides (TG), low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol and blood glucose levels) and data on history of hypertension and diabetes, obtained from the patient's medical records. Participants who consented were 1 week after MI questioned and examined at VSIA Pauls Stradins Clinical University Hospital Cardiology Centre. Then, each participant received information on the recommendations of the risk modification options and 1 month after MI was reexamined and evaluated at the VSIA Pauls Stradins Clinical University Hospital of Physical Medicine and Rehabilitation Centre. The research data were collected and analyzed in Microsoft Office Excel 2007 (chi-square) and SPSS Statistics 19 (descriptive statistics (mean, standard deviation), comparative statistics (*t*-test), significance value of $p < 0.05$. *Results and Conclusion:* 1) During the study participants statistically significant ($p < 0.05$) decreased TH, TG, LDL cholesterol and blood glucose levels, BMI and waist circumference for men. 2) During the study participants changed their lifestyle habits. Many of them reduced fat and salt in the diet, many participants stoped drinking alcohol. A significant increase was noted in the number of participants who engaged regularly in physical activity every day. Two participants completely stopped smoking and many reduced the number of cigarettes smoked daily. 3) After analyzing changes in risk factors within a month after MI it can be concluded that the recommendation can be used for cardiovascular risk factor modification for patients who have experienced a first-time MI.

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### MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL AND CARDIOVASCULAR CAPACITY AFTER HEART ATTACK REHABILITATION AS PREDICTORS OF MOOD DISORDERS

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*Introduction:* Mood disorders are quite common among cardiac patients. They may be influenced by both physical changes and stable personality characteristics. *Aim:* To examine the relationship between cardiovascular capacity, health locus of control and emotional status for myocardial infarction survivors after cardiac rehabilitation. *Methods:* Patients, who took cardiac rehabilitation from 01.01.2010 to 01.06.2010, were questioned by mail. Answers were received from 30 (37.5%) of 80 selected patients. Selection criteria were: myocardial infarction, percutaneous coronary interventions, performed cardiopulmonary exercise testing during rehabilitation. Cardiovascular capacity was assessed by anaerobic threshold (AT). Higher cardiovascular capacity considered when AT was higher than 15 ml/kg/min. Mood disorders were assessed using the Hospital Anxiety and Depression scale during rehabilitation and 6 months after. Multidimensional health locus was assessed by the Multidimensional Health Locus of Control 6 months after rehabilitation. *Results:* There was no statistically significant correlation between cardiovascular capacity at the end of rehabilitation and anxiety ($r = 0.2$; $p > 0.05$) or depression ($r = -0.17$; $p > 0.05$) scores 6 months after rehabilitation. There was no statistically significant correlation between Chance ($r = -0.03$; $p > 0.05$), Internal ($r = -0.4$; $p > 0.05$) or External ($r = -0.2$. $p > 0.05$) health locus of control and depression scores. There was no statistically significant correlation between Chance ($r = -0.35$; $p > 0.05$) or External ($r = 0.05$; $p > 0.05$) health locus of control and anxiety scores. Higher anxiety scores were associated with Internal health locus of control ($r = -0.4$; $p < 0.05$). It means that bigger anxiety is associated with less self-confidence. The too low response rate is a limitation of the study. *Conclusions:* The results may suggest that mood disorders 6 months after cardiac rehabilitation are associated with personality constructs but not with cardiovascular capacity at the end of rehabilitation.

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## PHYSICAL FITNESS OF INDIVIDUALS WITH CHRONIC SPINAL CORD INJURY

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*Introduction:* Individuals with spinal cord injury have among the lowest levels of physical activity participation compared to other populations. They also demonstrate early onset of cardiovascular disease and other chronic diseases. For individuals with spinal cord injury physical activity can add health benefits. *Aim:* The aim of the study was to evaluate physical capacity of individuals with chronic spinal cord injury. *Methods:* The study group comprised 32 males, age range 33.7 ± 4.11 years, injury level Th7–L2. The time after spinal cord injury was 8.50 ± 2.35 years. We evaluated muscle and fat mass index, cardiopulmonary function, the data of physical and social activity in daily life. Cardiopulmonary function was evaluated by the cardiopulmonary diagnostic system Vmax of the US 'Sensor Medics Corporation'. The data of physical and social activity in daily life was gathered by questionnaires. *Results:* The muscle and fat mass index was higher in paraplegics with additional physical training and social activity in comparison with paraplegic individuals with physical inactivity and social isolation ($p < 0.05$). Paraplegics with additional physical training and social activity in daily life reached higher $VO_{2peak}$ than paraplegics with routine activity ($p < 0.05$). *Conclusion:* The daily life activities of paraplegic individuals with no additional physical training are not intense enough to maintain a satisfactory level of physical activity.

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## ISCHEMIC HEART DISEASE PATIENTS' COMPLIANCE WITH TREATMENT RECOMMENDATIONS AND QUALITY OF LIFE

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*Introduction:* Ischemic heart diseases (IHD) affect a person's daily physical, social, emotional, and intellectual activity and disturb the patients' physical functioning (1) and have a negative effect on the quality of life (QOL). Studies have shown that in clinical practice, a large part of patients with IHD fail to achieve the recommended aims of the reduction in risk factors (2). In Lithuania, the situation with achieving the aims of the reduction of risk factors in patients with IHD is complicated as well (3). *Aim:* To evaluate compliance with the treatment recommendations and QOL changes in patients with high risk for IHD. *Methods:* The patients were randomly selected for the study: individuals with determined high risk for IHD. The patients were investigated twice. The second examination took place about one year after the first one. A total of 122 patients met the inclusion criteria and consented to participate in the study. After one year, we inquired 105 patients (response rate 95%). The patients' QOL was evaluated using the SF-36 questionnaire. Other methods applied to the study were inquiry (for the evaluation of risk factors, lifestyle, and medical history), analysis of medical documents (cholesterol levels and glycemia in blood), and objective examination (height, weight, waist circumference, and arterial blood pressure). *Results:* The study showed that controllable cardio-vascular disease (CVD) risk factors were associated with lower scores in physical health domains. 33.6% of the patients were found to be non-compliant. Non-compliant patients presented better evaluations of their QOL in the following domains: general health perception (65.46 and 57.44, respectively, $p = 0.036$), social functioning (88.46 and 81.48, respectively, $p = 0.041$), role limitation due to emotional problems (87.18 and 75.35, respectively, $p = 0.05$), and mental component summary measure (75.27 and 68.78, respectively, $p = 0.048$). The comparison of mean scores of non-compliant patients' after-one-year-QOL evaluation during the first and second study, showed significant improvements in four domains. However, after one year compliant patients presented better evaluation scores in seven domains. *Conclusions:* Controllable CVD risk factors were associated with lower scores in QOL domains. Patients' with high risk for IHD compliance with treatment recommendations helps to improve QOL.

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## *VOICE. SWALLOWING. URINATION. SKIN REPAIR FUNCTIONS.*

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## THE USE OF AN ELECTRICAL STIMULATION DEVICE IN REHABILITATION OF PATIENTS WITH VOICE DYSFUNCTION

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*Introduction:* Voice dysfunction is treated by individual phonopedic training and electrical stimulation. Electrical stimulation procedures are done during individual sessions, using all the phonation correction methods at the same time. The use of electrical stimulation by the VocaStim device is a new method in logopedic therapy and little is known about its effect on patients with voice dysfunction. *Aim:* The purpose of this study was to observe the effect of electrical stimulation using the VocaSTIM device on patients with voice disorders. *Methods:* The treatment group including 40 patients with voice dysfunction (dysphonia, aphonia, phonasthenia) was assessed using a laryngoscopic test. The functioning of vocal folds was evaluated before starting the phonopedic training and after the treatment. All the methods of correct phonation training were used: body posture modification, breathing correction, correction and intensification of articulation motions, phonic and kinaesthesic stimulation. Twenty patients of the treatment group had electrical stimulation procedures using the VocaSTIM devise. Stimulation with the VocaSTIM device is electric (constant or pulse electric current), acoustic (playback of recorded sounds) and optical (the patient is provided with postcard-

sized sheets with sounds). *Results:* After the logopedic treatment vocal functions were improved in both groups. However, the vocal functions of the group treated by electrical stimulation were better than that of the group treated by phonopedic training alone. *Conclusions:* Electrical stimulation in combination with phonation training may be beneficial for the recovery of voice functions.

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## ELECTROSTIMULATION AND ITS EFFECT ON ELIMINATION OF SWALLOW DISORDERS IN REHABILITATION

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*Introduction:* About 20% of patients in rehabilitation have swallowing disorders. Electrostimulation with VocaSTIM is used not only to eliminate speech and voice disorders, but it is also applied for the correction of dysphagia. *Aim:* To assess the effectiveness of electrostimulation using VocaSTIM in the elimination of swallowing disorders. *Methods:* A two-year trial of 60 patients treated in In-Patient Rehabilitation Unit 2 of Vilnius University Hospital. Two random sample groups were formed: one group with applied electrostimulation using VocaSTIM and logotherapy and the second was subject to logotherapy only. All patients had subjective evaluation of the swallowing function (water sample) done during usual meals. It was assessed how the patients swallowed liquid, semi-liquid semi-solid and solid food. Swallowing was assessed as good, satisfactory, poor, very poor and other. The selection of consistencies and the swallowing criteria was based on The Dysphagia Outcome and Severity Scale. A documentation analysis, a survey and observation have been carried out. *Results:* The group subjected to electrostimulation showed better results in swallowing liquid, semi-liquid semi-solid and solid food. There were no patients with serious swallowing disorders upon discharge in this group. The patients that were not applied electrostimulation also improved in their swallowing function, but there were still many patients with poor swallowing and a serious swallowing disorder. *Conclusions:* Electrostimuliation using VocaSTIM is a new and effective treatment method of swallowing disorders. Traditional swallowing correction methods used in logotherapy defer invasive treatment of dysphagia (probes, gastrostomy).

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## FUNCTIONAL RECOVERY FOR PATIENTS WITH POST-STROKE URINARY INCONTINENCE 6 MONTHS AFTER STROKE

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*Introduction:* Post-stroke urinary incontinence (PSUI) is an extensive problem for patients and their relatives. Urinary incontinence (UI) is a major problem after stroke, with a prevalence ranging to 80% in the days and weeks after infarct, with 25% still having problems on hospital discharge and remaining incontinent at one year (Brittain et al). Many immobile and cognitively impaired incontinent patients have different types and causes of UI that may be lessened or cured simply by improving the patient's functional status and general health condition (Abrams et al). *Aim:* To investigate the prognosis of functional recovery of patients with post-stroke urinary incontinence 6 months after stroke. *Results:* The study included 180 consecutive stroke admissions (78 females and 102 males). All had a comprehensive clinical assessment and cerebral computed tomography (CT). Urine test was performed in all patients. Urinary incontinence was more common for patients with subcortical lesions ($p = 0.004$) vs cortical ($p = 0.143$). The frequency of PSUI in the study population was 70.5%. The most common types in the acute stage were urgency and functional urinary incontinence. Patients with low Barthel Index rate had a higher incidence of urinary incontinence. Paresis ($p = 0.003$), afasia ($p = 0.001$) and sensory disturbance ($p = 0.001$) were significantly related to urinary incontinence. Patients with post-stroke urinary incontinence had worse functional outcomes 3 and 6 months after stroke. *Conclusions:* Post-stroke urinary incontinence is related with age, functioning and cognition disturbance. Urinary incontinence was more common in patients with subcortical lesions and anterior circulation stroke. Urinary incontinence was significantly correlated with neurologic symptoms.

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## FREQUENCY OF PATIENTS WITH BEDSORES AT AN IN-PATIENT REHABILITATION

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*Introduction:* Nurses working with in-patient rehabilitation, everyday face a problem of preventing the bedsores and healing the wounds. The process of healing bedsores demands much of time and attempts. It is easier to prevent bedsores than to heal them. Thus adequate attention must be paid to bedsores prevention, to look after properly when the bedsore occurs. *Aim:* To analyze the frequency of patients with bedsores during the years 2001–2010 at in-patient rehabilitation. *Methods:* The data of patients with bedsores at the Unit I of in-patient rehabilitation were analyzed. There were 81 patients with bedsores during years 2001–2010. Four parameters were measured: the condition of bedsore was evaluated using the Norton Scale (the evaluation was made twice: at the beginning and at the end of rehabilitation), the body area of the bedsore, the effectiveness of bedsore healing and bandaging. *Results:* There were 1,395 patients treated in the Unit I of in-patient rehabilitation during years 2001–2010. 81 (6%) patients came to rehabilitation having bedsores (61 male, 20 female). According to the Norton scale 9% patients had 1st degree, 21% had 2nd degree, 21% had 3rd degree, and 49% had 4th degree bedsores. The mean age of male patients was 53 years, female 54 years. A tendency of decrease of patients with bedsores is observed. Most of the patients with bedsores admitted in 2001 (21 patients), least – 2009 (4 patients). Seventy-six (100%) patients with bedsores came from the neurosurgery unit. Most frequently bedsores were diagnosed on sacrum (43.5%) and on heels (26.3%). 56.7% patients with bedsores had spinal cord injury, 24.3% were stroke survivors. Separate methods for the bedsore healing were used: position changes every 2 h (100% patients), special nursing means (spec. mattresses) (100% patients), wound bandages using saline and Bethadine solution (70% patients), antimicrobial bandages (5–10% patients), physiotherapy (20–25% patients). The bedsores were cured for 66.6–80% patients, for others the condition of bedsores improved. New bedsores occurred only for 1–2% patients. *Conclusions:* A tendency of

decrease of patients with bedsores in an in-patient rehabilitation unit is observed. For 66.6–80% of the patients the bedsores were cured using nursing means and healing.

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## *SENSATION OF PAIN. TREATMENTS.*

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### INFLUENCE OF DIFFERENT EDUCATION PROGRAMS TO ACTIVITIES AND PARTICIPATION IN PATIENTS WITH LOW BACK PAIN

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*Introduction:* Low back pain is a very common condition, particularly in developed countries. The lifetime prevalence of back pain exceeds 80%. Health professionals use patient education to help people learn about low back pain and ways to avoid it in the future. *Aim:* The aim of study was to evaluate influence of different training programs on activities and participations of patients with low back pain. *Methods:* The study included 80 patients, the average of age 47.6 (SD 13.4) years. The study included those who were suffering from low back pain. The patients were randomly allocated to two groups, the first group trained with oral instruction combined with written information and the second group was instructed with written instructions only. Activities and participations where evaluated using the International Classification of Functioning, Disability and Health. Pain was evaluated using a Visual Analog Scale. *Results:* The first group of patients showed best progress in object lifting, use of hands, dressing up, washing their body parts and bathing. Pain mean change was 2.1 (SD 1.4). The second group of patients advanced best in object lifting, dressing up, washing their body parts and bathing. Pain mean change was 1.6 (SD 1.1). The first group of patients performed in almost all activities better than the second group. It was statistically significant that instructed patients performed better in lifting objects, holding and handling objects with hands and in performing their daily self-care. *Conclusions:* Patient education is very important to patients with low back pain. Many different types of patient education are commonly used in clinical practice. Patient education by oral and written information is more effective than instruction by written information.

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### ANALYSIS OF RISK FACTORS FOR THE DIABETIC FOOT SYNDROME AMONG TYPE 2 DIABETES PATIENTS

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*Introduction:* Diabetes mellitus is a multifactoral chronical disease, that has been acknowledged as an important health care issue for its' increasing incidence, morbidity and economical losses in population (1). According to World Health Organization, in 2000, 3.2 million people died from complications associated with diabetes (2). Type 2 diabetes is the most common form of diabetes mellitus (90–95% of all diagnosed diabetes cases), and foot problems one of the main diabetes-related complications (1). The diabetic foot syndrome is a major cause for lower limb amputations and, thus, one of the contributing factors to morbidity and disability (3). Timely assessment and prevention of risk factors for diabetic foot helps to eliminate progression, complications and recrudescence of the disease (3). *Aim:* To evaluate and analyze risk factors for the diabetic foot syndrome among type 2 diabetes patients. *Methods:* The study was carried out using a literature-based questionnaire and assessment protocol; gained information aggregation and result analysis was done using Microsoft Excel and SPSS Statistics 17.0. *Results:* The analysis of risk factors for diabetic foot confirmed gained data on prevalence and development of such major risk factors as peripheral diabetic neuropathy and peripheral vascular disease in previously carried out studies, as well as showed statistically significant correlations between some of the risk factors - Body Mass Index and pain in the feet, gender and peripheral vascular disease, trauma and ulceration – and the diabetic foot syndrome. *Conclusion:* The risk factors for diabetic foot syndrome are a common health care problem among type 2 diabetes patients and there are statistically significant correlations between some of the risk factors, thus, it can be concluded that assessment of risk factors for the diabetic foot is an important part of both prevention and timely treatment of the complication.

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### POSTURE DISORDERS AMONG PHYSIOTHERAPY STUDENT

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*Introduction:* Studies indicate that musculoskeletal discomfort, back pain problems, and posture disorders are significant health and economic concerns in industrialized countries. Recent literature indicate that these disorders also are prevalent among students. Many epidemiological studies have shown that ergonomic factors and aspects of work organization play an important role in the development of these disorders. *Aim:* To evaluate postures of physiotherapy students of Vilnius University Medical Faculty. *Methods:* The study group comprised 58 physiotherapy students of Vilnius University Medical Faculty. The data about physical activity in daily life was gathered by a questionnaire. 58 students were evaluated using Hoeger's WWK posture evaluation method. *Results:* The students mean height was 173.63 cm (SD 7.1), mean body mass 64.5 kg (SD 10.3), mean BMI 21.52 kg/m² (SD 2.6). By Hoeger's WWK posture evaluation method 36.2% of students had average and lower than average posture. 72.4% of students

had asymmetric shoulder posture and 44.8% asymmetric pelvis posture. 43.1% of the students considered that their posture was not good. 36.2% of the students had low back pain, 24.1% cervical pain. 84.5% of the respondents considered that their work station ergonomic was poor. At the time of interview 56.9% of the students' physical activity was insufficient. *Conclusions:* In our survey we found high prevalence of posture disorders among university students. Although physiotherapy students are educated in balanced posture, movement patterns, ergonomy, and regular physical activity, they have difficulties to integrate these knowledge in their daily life.

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## COMPARISON OF EFFECTS BETWEEN AN AQUATIC GROUP AND AN NON-AQUATIC INDIVIDUAL PHYSIOTHERAPY GROUP IN LUMBAR DISC HERNIATION TREATMENT

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*Introduction:* A great number of research articles shows aquatic physical therapy as a promising method in lumbar spine disk herniation treatment, yet there is little research establishing its efficiency if applied in groups. *Aim:* The purpose of this study was to evaluate the effects of group aquatic physiotherapy compared to individual non-aquatic physiotherapy on the low back pain caused by lumbar spine disc herniation. *Methods:* A total of 30 subjects in two groups of 15 people (5 male and 10 female) ranging from 18 to 62 years old with lumbar spine herniation participated. The groups were matched by age, sex and pain symptoms. Group I age mean was 35 (SD 11.9) years, group II – 32.9 (SD 11.8). Participants were split into 2 groups, group I received 10 procedures of aquatic physical therapy, group II the non-aquatic physiotherapy. Measurements were taken before and after the physiotherapy cycle. Outcome measures included level of pain experienced, functional disability according to the Roland–Morris questionnaire and endurance of muscle groups stabilizing lumbar spine. *Results:* Both groups made statistically significant improvements in all tests. The group I results showed significantly greater effectiveness in lowering functional disability and improving trunk extensors endurance, resulting in an average decrease of 3.04 Roland–Morris questionnaire points opposed to 2.13 in group II. Increase in trunk extensors endurance was 49.3% compared with 31.5% in group II. Group II results showed significantly greater effectiveness in improving side abdominal muscle endurance, reaching 38.8% increase on left side and 36.4% on the right, while group I reached 19.0% and 18.1% increase, respectively. *Conclusion:* Compared with individual physiotherapy, a 10-procedure program of group aquatic physical therapy resulted in significantly greater improvement in disability and trunk extensors endurance, while individual non–aquatic physiotherapy showed greater effectiveness in increasing side abdominal muscle endurance. Further study is required of aquatic physiotherapy effectiveness in groups and individually.

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## EFFECT OF A SERIES OF H2S MINERAL WATER BATHING ON PAIN IN PATIENTS WITH FIBROMYALGIA – A PILOT STUDY

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*Introduction:* The fibromyalgia syndrome (FMS) is one of the chronic widespread pain syndromes. Besides chronic widespread pain, other symptoms include fatigue, sleep disturbance, irritable bowel syndrome and psychosomatic symptoms. Since the difficulties to prescribe best treatment for this FMS, therefore several studies have been developed in order to find best treatment, including pharmacology and non-pharmacology treatments. One of possibilities in non-pharmacology treatments for chronic pain patients is balneotherapy. Sulphur bathing is one of balneotherapies which is known to have effect on chronic pain patients. *Aim:* To observe the effect of a series of $H_2S$ mineral water bathing on pain in FMS patients. *Methods:* Thirty-two female patients were randomised into two groups. Nineteen patients received a series of 12 sulphur bath treatments (3 times per week) (study group) and 13 patients received same number and frequency of tap water baths (control). All baths were performed as head-out water immersion at 36°C for 20 min each. In the study group natural sulphur water with concentration of 20.4 mg $H_2S$/l, with a natural variation of 2 mg/l was used. Main outcome parameter for this study was the Fibromyalgia Pain Score (Lautenschläger et al. 1991). It was evaluated before each bath and at the end of the treatment series as well as at a 3-month follow up. As secondary outcome parameters pressure pain threshold according to the Wolfe's concept of tender points and representing peripheral pain sensitivity, and thermal pain threshold (forearm, bilateral) using PELTIER-thermode were measured before each bath. *Results:* The results showed that the fibromyalgia pain score was significantly reduced in 3 weeks duration ($p < 0.001$) of the series of sulphur bathing group, but not in the control group. However, the effect was not significant after three months of treatment. Pressure pain threshold values showed significant differences in sulphur bathing group compared to the control group ($p < 0.05$). However, heat- and cold pain thresholds did not show differences. *Conclusion:* This study suggests that sulphur bathing can be one of the alternative treatments for widespread chronic pain syndrome such as FMS. However the systemic effect of sulphur bathing should be studied further.

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## INFLUENCE OF A PEAT BATH SERIES ON QUALITY OF LIFE AND MOOD STATE IN PATIENTS WITH A HERNIATED VERTEBRAL DISC DURING AN INPATIENT ORTHOPAEDIC REHABILITATION

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*Introduction:* Peat baths increase perfusion, relax muscles and therefore they are used as an important therapeutic component in orthopaedic rehabilitation to treat pain. Empirically it is reported, that also mood state may be improved. *Aim:* The aim of the prospective uncontrolled study was to investigate the effect of a series of peat baths on quality of life, pain and mood state in patients with a herniated vertebral disc (HVD). *Methods:* Cardiovascularly healthy patients (19 female, 10 male, 45.2 ± 8.2 years) with HVD

were exposed to a series of six peat baths (40.5°C) during a three weeks inpatient standard orthopaedic rehabilitation. At admission and at final examination pain (VAS) and quality of life (SF-36) were registered. During the first (1), and during the sixth (6) peat bathing procedure, – each procedure consisted of 20 min recumbent rest (xR), 20 min peat bath (xB), and 20 min recumbent rest (xS), – mood state was estimated at the end of the three subunits by the validated Multidimensional Mood State Questionnaire (Steyer 1997, German abbreviation: MDBF). *Results:* At the final visit, pain ($p < 0.001$) and the physical component summary (pcs) of the SF-36 were improved ($p < 0.05$), especially the items "bodily pain" and "vitality" ($p < 0.01$), but not the mental component summary (mcs), $p > 0.05$. All MDBF-items were also improved ($p < 0.01$): "good/bad" from 1R: 16.2 (95% CI: 15.3; 17.1) to 6R: 17.3 (16.4; 18.2), "awake/tired" from 1R: 14.0 (12.8; 15.2) to 6R: 16.3 (14.8; 17.8) and "calm/nervous" from 1R: 16.2 (15.1; 17.2) to 6R: 17.7 (16.7; 18.6). In the course of the first bathing procedure (1R, 1B, 1S) all items increased continuously, however during the sixth bathing procedure the higher start levels (6R) were roughly stable at 6B and 6S. *Conclusion:* In orthopaedic rehabilitation of HVD a series of six peat baths within 3 weeks seems to be a valuable module to improve mood state, pain and the physical component of quality of life.

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## PATIENT'S EXPECTATIONS FOR TREATMENT OF MODERATE TO UNBEARABLE PAIN

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*Introduction:* There is an unresolved discussion about pain treatment goals. *Aim:* The aim of the study was to define expectations for treatment and its success for moderate and severe pain from the patient's perspective. *Methods:* A cross-sectional analysis was conducted at the Pain Clinic of Vilnius University Hospital Santariskiu Clinics in 2010–2011. 102 patients suffering from moderate to unbearable pain (5–10 points of 10) completed an adapted and complemented Patient Centered Outcomes Questionnaire (PCOQ). The patients' expectations of the treatment success were analyzed across 5 domains: pain (P), fatigue (F), emotional distress (ED), interference with daily activities (DA) and sleeplessness (S). *Results:* Sex: men 32.4%, women 67.6%. Average age 59.5 ± 15.4 years. Education: secondary 37.3%, higher 34.3%, university 28.4%. Work status: working 45 (44.1%), non-working 57 (55.9%). Pain duration: 1–6 weeks 6 (5.9%), 6 weeks–3 months 7 (6.9%), 3 months–1 year 15 (14.7%), >1 year 74 (72.5%). Usual rate of the domain: $p = 8.10 \pm 1.51$, $F = 6.78 \pm 2.41$, $ED = 5.55 \pm 2.83$, $DA = 6.46 \pm 2.42$, $S = 5.91 \pm 2.98$. Level of successful treatment: pain to be lower than 5.61 (69%), fatigue 4.10 (59%), emotional distress 3.55 (64%), interference with daily activities 3.81 (59%), sleeplessness 3.48 (59%) points. Expected results after treatment were $p = 0.36$ (14%), $F = 0.88$ (33%), $ED = 0.81$ (41%), $DA = 0.74$ (28%), $S = 0.68$ (28%) higher as compared to the successful treatment. The age positively correlated with the success criteria in domains F, ED, DA ($p < 0.01$), and with expectations criteria for ED ($p < 0.05$). Education negatively correlated with usual level for F ($p < 0{,}01$), successful and expected levels for F ($p < 0{,}05$). Pain duration positively correlated with the success criteria for F, ED, DA ($p < 00.5$), S ($p < 0.01$) and with expectations criteria for DA ($p < 0.05$), P and S ($p < 0.01$). Working status positively correlated with success criteria for F, ED ($p < 0.01$) and DA, S ($p < 0.05$). *Conclusions:* Patients expected their complaints to decrease after treatment, although they did not hope that actual results would manage to reach the level of their defined successful treatment. The expectations of elderly, non-working, with longer pain duration patients were lower. Participants with higher education showed higher expectations considering their life quality after treatment.

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## OCCUPATIONAL THERAPY FOR PERSONS WITH CERVICOBRACHIALGIA USING COMPUTER AT WORK

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*Introduction:* Information technology is rapidly spreading in people's lives. It is not easy to find any area of life where it is not used. The use of computers in the workplace is not only a contributor, but also a certain risk factor, especially if one ignores the rules of work - the standards of hygiene, and workplace ergonomics. *Aim:* To evaluate the influence of occupational therapy for persons with cervicobrachialgia. *Methods:* A study was done in Vilnius University hospital Santariškių klinikos, Rehabilitation, Physical and Sports Medicine Center (RPCMC) during the period 2010–2011 Jan–April. Thirty-five persons with cervicobrachialgia, 30 women and 5 men, participated in the study. Muscle strength was measured by a hydraulic hand dynamometer; knowledge about ergonomics was studied by a questionnaire. The questionnaire was developed based on the Lithuanian hygiene norms related to the list of employees' safety and health. Pain intensity was rated by visual pain scale. *Results:* The participants ranged from 21–60 years old; mean age was 45 years. Twenty-four participants used computer at work. Two evaluations were carried out; the first when the person just came to RPSMC, the second after 10 occupational therapy procedures. The average hand muscles strength of 16 persons was 10 kg and 19 persons 15 kg. After 10 occupational therapy procedures the average hand muscle strength improved: 25 persons 25 kg, 10 persons 30 kg. Persons using computer at work, had a lack of knowledge of ergonomics. At the beginning they evaluated themselves as 'satisfied' and after 10 occupational therapy procedures as 'good'. Persons' pain intensity was rated to $6.1 \pm 0.73$ points and after occupational therapy $8.2 \pm 0.41$. *Conclusion:* After occupational therapy persons with cervicobrachialgia showed increase in hand muscle strength, improved ergonomics knowledge assimilation and adaptation of their work with computer. No comparison group was used.

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