

# JRM JOURNAL OF REHABILITATION MEDICINE

The International  
Non-profit Journal

VOL. 51.

OCTOBER 2019

**6<sup>th</sup> Baltic and North Sea Conference on  
Physical and Rehabilitation Medicine**  
**Rehabilitation towards future health and participa-  
tion - an evidence-based strategy**  
**Oslo, Norway, October 9–10, 2019**

**ABSTRACT BOOK**

**Immediate  
Open Access**

**Official journal of the**

- UEMS European Board and Section of  
Physical and Rehabilitation Medicine  
(EBPRM)
- European Academy of Rehabilitation  
Medicine (EARM)
- Baltic and North Sea Forum for Physical  
and Rehabilitation Medicine (BNFPRM)

**Published in association with the**

- European Society of Physical and  
Rehabilitation Medicine (ESPRM)
- Canadian Association of Physical Medicine  
and Rehabilitation (CAPM&R)
- Asia Oceania Society of Physical and  
Rehabilitation Medicine (AOSPRM)
- Baltic and North Sea Forum for Physical  
and Rehabilitation Medicine (BNFPRM)

# Journal of Rehabilitation Medicine

Journal of Rehabilitation Medicine is an international peer-review journal published in English with ten regular issues per year. It is owned by a Swedish nonprofit organization: Foundation for Rehabilitation Information. Journal of Rehabilitation Medicine was former called Scandinavian Journal of Rehabilitation Medicine, which was founded by Olle Höök in 1968. The name was changed to Journal of Rehabilitation Medicine in 2001.

Journal of Rehabilitation Medicine aims to be a leading worldwide forum for research in physical and rehabilitation medicine, aiming to increase knowledge in evidence-based clinical rehabilitation. Contributions from all parts of the world and from different professions in rehabilitation are encouraged. Original articles, Reviews (including Educational reviews), Special reports, Short communications, Case reports, and Letters to the Editor are published. Clinical studies on rehabilitation in various patients groups, within neurological and musculoskeletal as well as in other relevant rehabilitation areas, reports on physical and behavioural treatment methodology, including rehabilitation technology, development and analysis of methodology for outcome measurements, epidemiological studies on disability in relation to rehabilitation, and studies on vocational and socio-medical aspects of rehabilitation will be considered for publication. The journal emphasizes the need for randomized controlled studies of various rehabilitation interventions, the use of the International Classification of Functioning, Disability and Health (ICF) as a background for reports when appropriate, and the use of modern psychometric methodology in treating and reporting data from ordinal scales.

## Editors-in-Chief

Kristian Borg, Stockholm, Sweden  
Henk Stam, Rotterdam, The Netherlands

## Past Editor-in-Chief

Bengt H. Sjölund, Malmö, Sweden

## Associate Editors

Ian Cameron, Sydney, Australia  
Franco Franchignoni, Veruno, Italy  
Ayse Küçükdeveci, Ankara, Turkey  
Jianan Li, Nanjing, China  
Klaas Postema, Groningen, The Netherlands  
Cecilie Røe, Oslo, Norway  
Gerold Stucki, Nottwil, Switzerland  
Britt-Marie Stålnacke, Umeå, Sweden  
Katharina Stibrant Sunnerhagen, Göteborg, Sweden  
Alan Tennant, Leeds, United Kingdom  
Guy Vanderstraeten, Gent, Belgium

## Honorary Editor

Gunnar Grimby, Göteborg, Sweden

## Editorial Board

Olavi Airaksinen, Kuopio, Finland  
Masami Akai, Saitama, Japan  
John R. Bach, Newark, USA  
Fin Biering-Sørensen, Copenhagen, Denmark  
Jörgen Borg, Stockholm, Sweden  
Helena Burger, Ljubljana, Slovenia  
Anne Chamberlain, Leeds, United Kingdom  
Andrea Cheville, Rochester, USA  
Richard Crevenna, Vienna, Austria  
Alain Delarque, Marseilles, France  
Jan Ekholm, Stockholm, Sweden  
Andrea Furlan, Toronto, Canada  
Björn Gerdle, Linköping, Sweden  
Martin Grabojs, Houston, USA  
Christoph Gutenbrunner, Hannover, Germany  
Marta Imamura, São Paulo, Brasil  
Fary Khan, Melbourne, Australia  
Yun-Hee Kim, Seoul, South Korea  
Gert Kwakkel, Amsterdam, The Netherlands  
Jan Lexell, Lund, Sweden  
Meigen Liu, Tokyo, Japan

Antti Malmivaara, Helsinki, Finland  
Nancy Mayo, Montreal, Canada  
Jean-Michel Mazaux, Bordeaux, France  
Frans Nollet, Amsterdam, The Netherlands  
Levent Özçakar, Ankara, Turkey  
Chang-il Park, Seoul, Korea  
Michael Quittan, Vienna, Austria  
Carol Richards, Quebec, Canada  
Nicola Smania, Verona, Italy  
Johan Stanghelle, Oslo, Norway  
Simon F.T. Tang, Tao-Yuan, Taiwan  
Jean-Louis Thonnard, Bruxelles, Belgium  
Leanne Togher, Sydney, Australia  
Lynne Turner-Stokes, London, United Kingdom  
Rita van den Berg-Emons, Rotterdam, The Netherlands  
Jean-Michel Viton, Marseilles, France  
Anthony B. Ward, Stoke on Trent, United Kingdom  
Günes Yavuzer, Istanbul, Turkey  
Alain Yelnik, Paris, France

## Contact persons for the organizations:

*UEMS European Board of Physical and Rehabilitation Medicine:* Rolf Frischknecht, Lausanne, Switzerland

*European Academy of Rehabilitation Medicine:* Guy Vanderstraeten, Gent, Belgium

*European Society of Physical and Rehabilitation Medicine:* Elena Milkova Ilieva, Plovdiv, Bulgaria and Calogero Foti, Rome, Italy

*Canadian Association of Physical Medicine and Rehabilitation:* Colleen O'Connell, Fredericton, New Brunswick, Canada

*Asia Oceania Society of Physical and Rehabilitation Medicine:* Simon F.T. Tang, Tao-Yuan, Taiwan

*Baltic and North Sea Forum for Physical and Rehabilitation Medicine:* Christoph Gutenbrunner, Hannover, Germany

## All correspondence concerning manuscripts, editorial matters and subscription should be addressed to:

Editorial Manager: Mrs Agneta Andersson,  
agneta@medicaljournals.se

Editorial assistant: Åsa Lundell, asa@medicaljournals.se  
For postal address: see inside back cover

**Publication information:** Journal of Rehabilitation Medicine (ISSN 1650-1977) volume 51 comprises ten issues published in January, February, March, April, May, June, July, September, October and November.

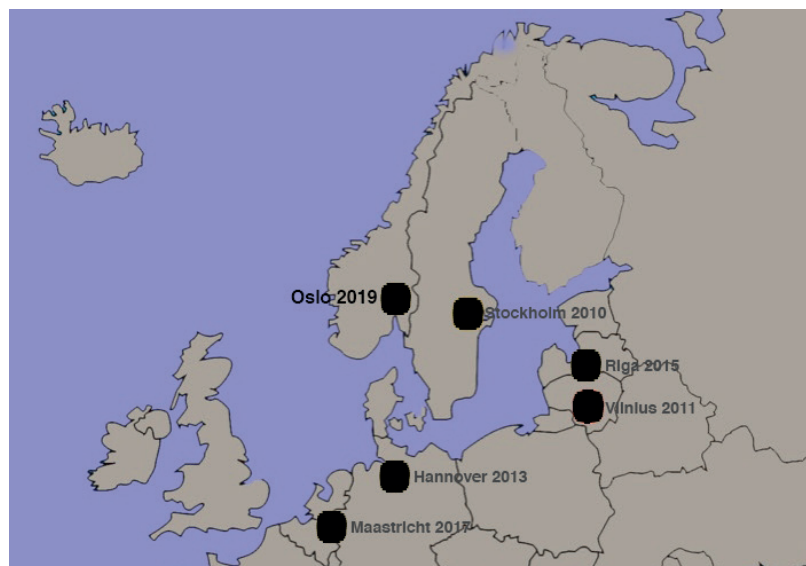
**Indexing:** Journal of Rehabilitation Medicine is indexed in Index Medicus/MEDLINE, Excerpta Medica/EMBASE, Biological Abstracts, Current Contents/Clinical Practice, Allied and Alternative Medicine Database (AMED), Applied Social Sciences Index & Abstracts, Ergonomic Abstracts, Psychological Abstracts PsycINFO, PSYCLIT DATABASE, Cumulative Index to Nursing & Allied Health Literature (CINAHL), Developmental Medicine and Child Neurology, Exceptional Child Education Resources, Periodicals Scanned and Abstracted: Life Sciences Collection, Faxon Finder, Focus On Sports Science & Medicine, Research Alert, SCISEARCH, SportSearch.

# 6<sup>th</sup> Baltic and North Sea Conference on Physical and Rehabilitation Medicine

Rehabilitation towards future health and participation - an evidence-based  
strategy

*Oslo, Norway  
October 9–10, 2019*

## Abstract book



Baltic & North Sea Conferences on PRM



**Invited lectures**

<b>IL1: Olle Höök Lecture – Stroke rehabilitation: state of the art, Katharina Stibrant Sunnerhagen</b>	5
<b>IL2: Historic perspective on the development of Physical Medicine and Rehabilitation in Journal of Rehabilitation Medicine, Gunnar Grimby</b>	5
<b>IL3: Multidisciplinary assessments in PRM, past and future, Unni Sveen</b>	5
<b>IL4: Future challenges in publishing in scientific journals, Henk Stam</b>	5
<b>IL5: Family matters in neurorehabilitation: why, when, who and how? Anne Norup</b>	5
<b>IL6: Physical activity for improving health in chronic pain, Monika Löfgren</b>	5
<b>IL7: Family-based rehabilitation, Mari Rasmussen</b>	5
<b>IL8: Goal-centered outpatient rehabilitation programs, Laraine Winter</b>	5
<b>IL9: Rehabilitation Services in Australia – Models of Care &amp; Underlying Guiding Principles, Andrew M Cole</b>	6
<b>IL10: Participation, Dominique van de Velde</b>	6
<b>IL11: The use of robot technology in rehabilitation, Beata Tarnacka</b>	6
<b>IL 12: Personal and environmental factors promoting participation in children with special needs, Mats Granlund</b>	6
<b>IL13: How to optimize the impact of rehabilitation in health care, Antti Malmivaara</b>	6
<b>IL14: Challenges in PRM education and training, Grethe Maanum</b>	6
<b>IL15: PRM organization in the Baltic countries, Guna Berzina</b>	7
<b>IL16: PMR organization in the Scandinavian countries, Catharina Deboussard</b>	7
<b>IL17: Multiprofessional teamwork and future health services needs, Christoph Gutenbrunner</b>	

**Workshops**

<b>WS1: Dilemma game, Henk Stam</b>	7
<b>WS2: Lay writing and presenting, Kristian Borg</b>	7
<b>WS3: How to use ICSO-R, Christoph Gutenbrunner, Boya Nugraha</b>	7

**Free Oral Presentations**

<b>OP1: Spinal cord injury in the pediatric population - an international multicenter study, Wiebke Höfers, Vivien Jørgensen, Marika Augutis, Peter New, Susanne Sällström, Johan Stanghelle, Kirsti Skavberg Roaldsen</b>	8
<b>OP2: Individual goals for rehabilitation; what is the content of the goals? Do they predict improvement during rehabilitation and sustainable effects at follow-up? Line Preede, Cecilie Røe Helene Sjøberg, Håkon Dalen, Erik Bautz-Holter, Astrid Nyquist, Reidun Jahnsen</b>	8
<b>OP3: Advancing rehabilitation research by creating a robust database of individual participant data: the RELEASE database of aphasia after stroke, Frank Becker</b>	8
<b>OP4: Pain and electromyographic improvements of core stabilization exercise and proprioceptive neuromuscular facilitation in chronic low back pain patients, Pattanasin Areeudomwong, Vitsarut Buttagat</b>	9
<b>OP5: Effectiveness of work-related medical rehabilitation in patients with chronic musculoskeletal diseases, Marco Streibelt, Miriam Markus, Michael Schuler, Christian Gerlin, Matthias Bethge</b>	9
<b>OP6: The Montreal Cognitive Assessment: the cut-off scores for predicting the functional dependence after stroke, Tamar Abzhandadze, Lena Rafsten, Åsa Lundgren Nilsson, Annie Palstam, Katharina S. Sunnerhagen</b>	9

<b>OP7: Comparing the effects of traditional Thai massage and muscle energy technique on patients with chronic neck pain associated with myofascial trigger points,</b> <i>Vitsarut Buttagat, Kanokwan Muenpan, Witawit Wiriyasakunphan, Saowalak Pomsuwan, Pattanasin Areedumwong</i>	10
<b>OP8: Predictive validity of the daily work capacity in the medical rehabilitation regarding the access to early retirement due to permanent work disability,</b> <i>Uwe Egner, Marco Streibelt</i>	10
<b>OP9: Transition of care in patients with TBI – Results from the Center-TBI study,</b> <i>Nada Andelic</i>	10
<b>OP10: Fear Avoidance Beliefs Questionnaire (FABQ): Does it really measure fear beliefs?</b> <i>Cecilie Røe</i>	10
<b>OP11: Visual dysfunction in acquired brain injury: clinical findings and their association with self-reported symptoms,</b> <i>Märta Berthold-Lindstedt, Jan Johansson, Jan Ygge, Kristian Borg</i>	10
<b>OP12: In hospital at home. Service Innovation with Focus on Interdisciplinary Collaboration,</b> <i>Ingebjørg Irgens</i>	11
<b>OP13: High-level mobility after an aneurysmal subarachnoid haemorrhage,</b> <i>Ludvig Toftedahl, Tanja Karic, Kristin Heier Johansen, Angelika Sorteberg, Ingerid Kleffjellgård, Helene Lundgaard Søbørg</i>	11
<b>OP14: Depending on functional dependency at discharge; different predictors are important for outcome after stroke,</b> <i>Hanna C. Persson, Daniel Hörsell, Emma Westerlind</i>	11
<b>OP15: The description of health-related rehabilitation service provision and delivery in randomized controlled trials. A topic review,</b> <i>Nada Andelic, Juan Lu, Christoph Gutenbrunner, Boya Nugraha, Cecilie Røe</i>	11
<b>OP16: Longitudinal study of postural balance changes in people with stroke,</b> <i>Dongni Johansson, Lena Rafsten, Katharina S Sunnerhagen</i>	12
<b>OP17: Patients functioning 2 months after mild-to-moderate TBI,</b> <i>Emilie Isager Howe, Silje C. R. Fure, Marianne Løvstad, Torgeir Hellstrøm, Nada Andelic<sup>1</sup></i>	12
<b>OP18: Home-based stroke rehabilitation service evaluation,</b> <i>Aija Voitkevica, Guna Berzina</i>	12
<b>OP19: The effectiveness of video-guided exercise after a stroke,</b> <i>Madeleine Kenny, Rory O'Connor</i>	13
<b>OP20: Pre-stroke physical activity could affect cognition early after stroke,</b> <i>Malin Reinholdsson, Katharina S. Sunnerhagen, Annie Palstam</i>	13
<b>OP21: Provision of a multi-professional health-related rehabilitation service in day hospitals in the Riga territorial unit,</b> <i>Līga Korosevska, Guna Berzina</i>	13
<b>OP22: Kinematic movement analysis of upper extremity in persons with spinal cord injury,</b> <i>Lamprini Lili, Katharina S. Sunnerhagen, Margit Alt Murphy</i>	13
<b>OK23: Intensive augmented speech-language therapy for post stroke aphasia delivered by telerehabilitation – a pragmatic pilot randomized controlled trial,</b> <i>Hege Prag Ora, Melanie Kirmess, Marian Brady, Frank Becker</i>	14
<b>OP24: Decision-making process in the selection of mobility assistive devices in the Latvian context,</b> <i>Zoya Osipova, Signe Tomsone</i>	14
<b>Poster Abstracts</b>	
<b>PP1: Improvement of mobility of patients with spinal cord injury in C4–C8 segments based on the International Classification of Functioning, Disability and Health,</b> <i>Laura Gulbinaitė, Aušra Adomavičienė, Evelina Narutytė, Alvydas Juocevičius</i>	15
<b>PP2: Participation and autonomy five years after stroke: A longitudinal observational study,</b> <i>Annie Palstam, Astrid Sjödin, Katharina S Sunnerhagen</i>	15
<b>PP3: Analysis of daily physical activities by combination accelerometer and diary monitoring data: feasibility study in two different populations,</b> <i>Lina Butane, Daina Smite, Andris Skride</i>	15
<b>PP4: Cognitive fatigue after an acquired brain injury causes a lower health-related quality of life,</b> <i>Elisabeth Åkerlund, Hanna C. Persson, Katharina S. Sunnerhagen</i>	16



## INVITED LECTURE ABSTRACTS

## IL1

**OLLE HÖÖK LECTURE – STROKE  
REHABILITATION: STATE OF THE ART****Katharina Stibrant Sunnerhagen, MD, PhD***Department of Rehabilitation, Sahlgrenska University Hospital, Göteborg, Sweden*

Abstract is not available.

## IL2

**HISTORIC PERSPECTIVE ON THE  
DEVELOPMENT OF PHYSICAL MEDICINE  
AND REHABILITATION IN JOURNAL OF  
REHABILITATION MEDICINE****Gunnar Grimby, MD, PhD***Department of Rehabilitation, Sahlgrenska University Hospital, Göteborg, Sweden*

Abstract is not available.

## IL3

**MULTIDISCIPLINARY ASSESSMENTS IN PRM,  
PAST AND FUTURE****Unni Sveen, PhD***Department of Physical Medicine and Rehabilitation, Oslo University Hospital Ullevål, Oslo, Norway*

Abstract is not available.

## IL4

**FUTURE CHALLENGES IN PUBLISHING IN  
SCIENTIFIC JOURNALS****Henk Stam, MD, PhD***Department of Rehabilitation Medicine, Erasmus MC, University Medical Centre, Rotterdam, The Netherlands*

Abstract is not available.

## IL5

**FAMILY MATTERS IN  
NEUROREHABILITATION: WHY, WHEN, WHO  
AND HOW?****Anne Norup, PhD***Department of Neurorehabilitation/TBI unit*

Family matters in neurorehabilitation: why, when, who and how? The objective of this talk is to describe the different types of family matters that professionals deal with every day when working in neurorehabilitation. This talk emphasizes WHY including the closest family members is essential in neurorehabilitation, and WHEN during the rehabilitation it is important to work with the whole family.

Furthermore, the talk summarizes family reactions throughout the rehabilitation process as well as identified family needs at different timepoints. The talk will examine WHO in the family is more at risk of poor caregiver outcome. Lastly, the talk will address HOW it is possible to work with the family in the different rehabilitation phases.

## IL6

**PHYSICAL ACTIVITY FOR IMPROVING  
HEALTH IN CHRONIC PAIN****Monika Löfgren, PhD***Department of Clinical Sciences Karolinska Institutet and Department of rehabilitation medicine, Pain rehabilitation Danderyd hospital Stockholm, Sweden.*

In chronic pain, exercise is the most often recommended evidence-based treatment. Exercise reduces levels of pain, at least in the long-term, as well as having positive effects on health, increased levels of activity, function and quality of life. Exercise is a treatment safe from serious side effects compared to pharmacological treatment. Still, it has been shown to be difficult for patients with long-term pain to exercise and/or to show long-term adherence to their exercise programs. One factor which strongly influences the willingness to exercise is pain exacerbation during and after exercise due to a disturbed function of endogenous pain control mechanisms, as is often seen in patients with chronic pain. In healthy, pain free populations, a single bout of exercise leads immediately to a decrease in pain sensitivity, an effect of so-called exercise induced analgesia (EIA). EIA is a result of centrally mediated top-down pain inhibition and influenced both by internal and external factors. In patients with chronic pain, research has shown alterations in the function of EIA. For example, in fibromyalgia no function of EIA is seen, resulting in increased pain sensitivity during and following exercise. A similar pattern is seen in patients with whiplash associated disorders, while patients with low-back pain or rheumatoid arthritis show functioning EIA. In patients with pain exacerbations from exercise, this will be a major barrier and needs to be addressed to allow these patients to benefit from exercise. The function of EIA has implications for recommendations for exercise prescription. Recommendations should be specific to the needs of different groups of patients. Physiotherapists and others using exercise in the treatment of patients with chronic pain need to have sufficient knowledge to explain EIA to patients. They also need to support patients in their exercise, in how to adjust the exercises according to the individuals' EIA function.

## IL7

**FAMILY-BASED REHABILITATION****Mari Rasmussen, PhD***Department of Physical Medicine and Rehabilitation, Oslo University Hospital Ullevål, Oslo, Norway*

Abstract is not available.

## IL8

**GOAL-CENTERED OUTPATIENT  
REHABILITATION PROGRAMS****Laraine Winter, PhD***Philadelphia VA Medical Center, USA*

Abstract is not available.

## IL9

**REHABILITATION SERVICES IN AUSTRALIA – MODELS OF CARE & UNDERLYING GUIDING PRINCIPLES****Andrew M Cole, MBBS (Hons) FAFRM (RACP)***Hammond Care, Sydney NSW Australia; Conjoint Associate Professor, UNSW, Sydney, Australia*

**Introduction:** Rehabilitation services restore people and their carers, to best quality of life. They function in socio-political contexts, with guiding principles (explicit or not) informing Models of Care (MoC). MoC are used to develop new or existing services, progressing rehabilitation care to ever-better levels of quality and care. Australian Context and Guiding Principles. Australia is a multicultural liberal social democratic nation, formed by the 1901 federation of former British colonial states and territories, planted upon the landscape of the oldest continuing aboriginal culture in the world. With universal healthcare, our community health and aged care services are funded nation-wide, with public hospitals administered by the states. Our guiding rehabilitation principles include: service leadership; equitable timely access to patient-centred multidisciplinary care; evidence-based care; and care provided in the right/appropriate setting. A patient may start their rehabilitation in acute inpatient care; increasingly, rehabilitation now occurs elsewhere however. **Care Models and Settings:** Rehabilitation care in Australia is described in 6 defined settings: a) In-reach into acute hospital wards; b) Subacute inpatient services, either co-located with or off-site from an acute hospital; c) Ambulatory Day Hospital care; d) Ambulatory single-therapy outpatient care; e) Home-based care; f) Out-reach to non-specialist settings. **Enablers of Quality Rehabilitation:** Numerous factors underpin quality rehabilitation, including: a well-trained and sufficient workforce; accurate data collection/collation for performance review and improvement; integrated assessment and care coordination, between hospital and community services; improvements in technology; and appropriate infrastructure and referral pathways, often with 'hub-and-spoke' links between larger and smaller care program centres. **Implementing Models of Care Improvements:** Having access to agreed MoC documents, each service undertakes a 'gap analysis' between their present situation, and future possibilities. Jurisdictions (e.g. government health departments) set Key Performance Indicators (KPIs) for comparative service performance and improvements. Criteria are set for rehabilitation admissions and for transfer of care, in/out of each care setting. New and emerging therapies and workforce roles should drive MoC development, with reviews of workforce standards and skill mix. **Conclusion:** Appropriately-applied Models of Care are powerful tools allowing the establishment, development, assessment and improvement of professionally-accountable rehabilitation services, bench-marked against external care standards.

## IL10

**PARTICIPATION****Dominique van de Velde, PhD***Department of Rehabilitation Sciences and Physiotherapy, Occupational Therapy programme, Ghent, Belgium*

Abstract is not available.

## IL11

**THE USE OF ROBOT TECHNOLOGY IN REHABILITATION****Beata Tarnacka, PhD***Department of Rehabilitation, Medical University of Warsaw, 1<sup>st</sup> Faculty of Medicine, Warsaw, Poland, Department of Rehabilitation, Eleonora Reicher National Institute of Geriatrics, Rheumatology and Rehabilitation, Warsaw, Poland*

Disorders of gait and dexterity of the hand often negatively affect the patient's functioning and quality of life. Improving gait function and upper limb are therefore the most important therapy goals in neurological rehabilitation. Recently, the number of different robotic devices has been constructed and introduced to the sales market to overcome problems with conventional physical therapy. Gait rehabilitation using robotics is a very new field in Poland and we are seeing a very large increase in interest in this therapy, especially for commercial centers dealing with rehabilitation. This type of rehabilitation in Poland is not refunded by the state. In Poland the stationary and overground walking systems are most often used to improve the ability of walk. In the presentation the possibilities of robotic rehabilitation of gait in Poland are shown with special emphasis on issues: what systems are most commonly used and how patients are qualified for this type of therapy. At the end of the lecture, cases of rehabilitated patients with gait problems will be presented.

## IL12

**PERSONAL AND ENVIRONMENTAL FACTORS PROMOTING PARTICIPATION IN CHILDREN WITH SPECIAL NEEDS****Mats Granlund, PhD***School of Health Sciences, Jönköping University, Jönköping, Sweden*

Abstract is not available.

## IL13

**HOW TO OPTIMIZE THE IMPACT OF REHABILITATION IN HEALTH CARE****Antti Malmivara, MD, PhD***Centre for Health and Social Economics / Scientific Unit, Helsinki, Finland*

Abstract is not available.

## IL14

**CHALLENGES IN PRM EDUCATION AND TRAINING****Grethe Maanum, PhD***Department of Research, Sunnaas Rehabilitation Hospital, Nesoddtangen, Oslo, Norway*

Abstract is not available.

## IL15

**PRM ORGANIZATION IN THE BALTIC COUNTRIES****Guna Berzina, PhD***Physical and Rehabilitation Medicine, Riga Stradiņš university, Riga, Latvia*

Abstract is not available.

## IL16

**PMR ORGANIZATION IN THE SCANDINAVIAN COUNTRIES****Catharina Deboussard, MD, PhD***Karolinska Institutet, Department of Rehabilitation Medicine, Stockholm, Sweden*

Health care systems for rehabilitation in the Scandinavian countries are grounded on the principles of providing high quality health evidence-based care for all according to need, on an equal basis. Services are structured similarly to other forms of healthcare, with primary, secondary (more specialised, often based in hospitals or larger units) and tertiary (regional) services. Ensuring that all levels of the system offer up to date, evidence-based rehabilitation care presents multiple challenges and requires continuous dialogue both between rehabilitation professionals and with acute care colleagues and other authorities, locally, regionally and nationally. Some successful Scandinavian examples of brain injury rehabilitation models incorporating organisational aspects can provide inspiration for future developments in all countries: 1) Norway: integrated rehabilitation on the intensive care unit at Oslo University Hospital allows an un-

broken chain of care for patients with traumatic brain injury, and has been shown both to improve outcome, and to have health-economic benefits. 2) Denmark: a centralised care model focusing on the needs of patients with severe traumatic brain injury has been in place for over a decade: chain of care from coma to community for the most severely injured patients is clearly defined, with prioritised access to the most specialised (tertiary) resources. 3) Sweden: the regional rehabilitation unit for Stockholm at Danderyd has developed a team for young adults with acquired brain injuries, supporting the transition from being a child with an acquired brain injury into adulthood and working with non-health care organisations (schools, employment office, insurance office) to offer optimal support. Truly patient-centred care can only be accomplished with improved collaboration across specialty boundaries (e.g. neurosurgery, rehabilitation medicine, psychiatry, and addiction care for brain injury). A recurring theme in discussions with acute care colleagues is the need for a common language and clarity at the interface between acute and rehabilitation care. Health care systems need to define what constitutes an adequate assessment of the patient's rehabilitation needs, who should perform this assessment, and when. There needs to be sufficient understanding that this very process needs to be adapted to the severity and complexity of the patient's condition.

## IL17

**MULTIPROFESSIONAL TEAMWORK AND FUTURE HEALTH SERVICES NEEDS****Christoph Gutenbrunner, MD, PhD***Hannover Medical School, Dept. Rehabilitation Medicine, Hannover, Germany*

Abstract is not available.

**WORKSHOP ABSTRACTS**

## WS1

**DILEMMA GAME****Henk Stam, MD, PhD***Department of Rehabilitation Medicine, Erasmus MC, University Medical Centre, Rotterdam, The Netherlands*

Abstract is not available.

## WS2

**LAY WRITING AND PRESENTING****Kristian Borg, MD, PhD***Div of Rehabilitation medicine, dept of Clinical Sciences, Karolinska Institutet, Danderyd University Hospital, Stockholm Sweden*

During the last decade there has been a shift in the financing of scientific journal. They used to be financed by subscription from university libraries, and national and international organizations. When open access was launched in many scientific journal, articles were financed

by the authors, in many cases of the funding organizations. This means that the scientific articles nowadays are free to read and download for everyone and that there is a demand that members of the general public, patient and patient organizations, media as well as donors and organizations funding research should be able to read and understand a scientific article. Thus, there is a need of lay abstract or a lay summary in order to summarize a research project and explain ideas and background, methods, results and the conclusion for someone who do not have prior knowledge of the subject.

## WS3

**HOW TO USE ICSO-R****Christoph Gutenbrunner, MD, PhD, Boya Nugraha, PhD***Hannover Medical School, Dept. Rehabilitation Medicine, Hannover, Germany*

Abstract is not available.



## Free Oral Presentations

## OP1

**SPINAL CORD INJURY IN THE PEDIATRIC POPULATION - AN INTERNATIONAL MULTICENTER STUDY**

**Wiebke Höfers, MSc, PhD-student<sup>1</sup>, Vivien Jorgensen, PhD<sup>1</sup>, Marika Augutis, PhD<sup>2</sup>, Peter New, Associate professor<sup>3</sup>, Susanne Sällström, MSc<sup>1</sup>, Johan Stanghelle, Professor<sup>1</sup>, Kirsti Skavberg Roaldsen, Associate prof<sup>1, 4, 5</sup>**

<sup>1</sup>Sunnaas Rehabilitation Hospital, Oslo, Norway, <sup>2</sup>Sundsvall Hospital, Sundsvall, Sweden <sup>3</sup>Caulfield Hospital, Melbourne, Australia <sup>4</sup>Karolinska Institutet, Stockholm, Sweden, <sup>5</sup>Oslo Metropolitan University, Oslo, Norway

Due to the low incidence of pediatric spinal cord injury (SCI) and the high demand for knowledge and research, international cooperation is needed to build a solid and shared understanding of the extent of the problem, and also uniformity in treatment and measurement methods. The aim of the study is to map organization of care and rehabilitation of children and adolescents <18 years of age with SCI, to explore qualitatively psychosocial aspects of individuals and to establish use of common outcome measures in 10 rehabilitation units from seven countries, cooperating within the Sunnaas International Network in Rehabilitation (SIN); China, USA, Russia, Israel, Palestine, Norway and Sweden. *Method:* In Phase I of the project (2018–2020) two cross-sectional studies is conducted to set the scene for the outcome studies following in Phase II (2021–2023). Phase I consists of a quantitative descriptive study using a web-survey to describe and compare the systems of care and delivery of inpatient rehabilitation services for pediatric SCI patients. In addition, a qualitative study will explore the psychosocial aspects of living with a childhood acquired SCI. Two adolescents, aged 13–16 years and at least 6 months post-acute treatment, from each unit will interviewed using a semi-structured interview guide. Ethical approval has been applied for in each unit, and the study is registered at ClinicalTrials.gov. A workshop for the 24 study team members, where the main focus was to ensure that data collection is conducted in a good manner, was held in May 2018, and data collection is finalized by Juni 30, 2019. Phase II will consist of methodological outcome studies. *Discussion:* Phase I of the study will broaden the body of knowledge on pediatric SCI internationally, thus enabling comparison, discussion and development of organizational models and quality of care and rehabilitation for young persons with SCI. Phase II will contribute to the use of common and reliable outcome measures for these patients.

## OP2

**INDIVIDUAL GOALS FOR REHABILITATION; WHAT IS THE CONTENT OF THE GOALS? DO THEY PREDICT IMPROVEMENT DURING REHABILITATION AND SUSTAINABLE EFFECTS AT FOLLOW-UP?**

**Line Preede<sup>1,3</sup>, Cecilie Røe<sup>1,3</sup>, Helene Sjøberg<sup>1</sup>, Håkon Dalen<sup>2</sup>, Erik Bautz-Holter<sup>1,3</sup>, Astrid Nyquist<sup>2</sup>, Reidun Jahnsen<sup>2</sup>**

<sup>1</sup>Department of Physical Medicine and Rehabilitation, Oslo University Hospital Ullevål, Oslo, <sup>2</sup>Beitostølen Health sports Centre, Beitostølen, and <sup>3</sup>Institute of Clinical Medicine, Faculty of Medicine, University of Oslo, Oslo, Norway

*Background:* Goal setting is considered important for compliance and effect of rehabilitation. However, the process of goal setting has not been fully explored. The present study was undertaken to identify the goals set among individuals with chronic disabilities attending a rehabilitation program based on adapted physical activity and how

health professionals' guidance modified their goals. We also wanted to assess if outcome was influenced by the type of goals set. *Materials and methods:* All patients aged 18 years to 67 years admitted to rehabilitation at Beitostølen Healthsports Centre were eligible. Data were collected by a written questionnaire administered eight and four weeks before the rehabilitation, at admission and discharge of rehabilitation, four weeks and twelve months after the rehabilitation. Participants were asked to nominate two goals at admission and two at discharge. The goals together with goals set in collaboration with a physician upon arrival, were coded and linked to the international classification of functioning, disability and health (ICF). The linking was performed using the Norwegian translation and the ICF linking rules. As outcome, physical functioning were measured by the Medical Outcomes Study 12-item Short Form Health Survey (SF-12). *Result:* Goals were set by 150 subjects. Preliminary data results show that 417 ICF codes were applied at admission. The ICF domain most frequently used were "body function", secondly most used were "activities and participation". At discharge, 362 codes were applied. The ICF domain most frequently used were "activities and participation", secondly most used were "body function". The association between the goals nominated by the subjects alone and with the physician and their influence on function remains to be analysed. *Conclusion:* This study shows a tendency to a shift in goal profile towards the ICF category of "activities and participation" after a rehabilitation program based on adapted physical activity.

## OP3

**ADVANCING REHABILITATION RESEARCH BY CREATING A ROBUST DATABASE OF INDIVIDUAL PARTICIPANT DATA: THE RELEASE DATABASE OF APHASIA AFTER STROKE**

**Frank Becker, MD, PhD**

Sunnaas Rehabilitation Hospital, Nesoddtangen, Norway & University of Oslo, Institute of Clinical Medicine, Oslo, Norway

*Background and aims:* Big data offers advantages to rehabilitation research by allowing to process high volume and highly diverse information. It brings new opportunities for statistically examining subtle population patterns, heterogeneities and commonalities of subpopulations that may predict recovery but would have insufficient power to be detected in small data. Building a database by systematically sourcing pre-existing individual participant data (IPD) for secondary analyses is methodologically unbiased and offers the optimum opportunity to fully explore recovery across subpopulations. The aim of the present study was to create the REhabilitation and recovery of people with Aphasia after Stroke 'RELEASE' database: an international, multidisciplinary research resource of IPD for secondary analyses. *Methods:* We systematically searched (Cochrane Stroke Group Trials, MEDLINE, AMED, CINAHL, Cochrane Library Databases [CDSR, DARE, CENTRAL, HTA], LLBA, EMBASE, and SpeechBITE) for datasets which included a minimum IPD of 10 people with aphasia after stroke and information about time since stroke and language impairment. We invited corresponding authors of these publications to contribute their datasets, approached members of the Collaboration of Aphasia Trialists for contributions and searched for eligible data in the public domain. Demographic, stroke and aphasia data were double extracted, and speech and language therapy rehabilitation intervention details were captured supported by the Template for Intervention Description and Replication (TIDieR) checklist. *Results:* We identified 524 eligible records from 5,276 screened records, forming the RELEASE database with 5,928 IPD from 174 primary research datasets across 28 countries (3,940 IPD from 75 electronic datasets; 45 RCT (1,766 IPD), and 91 (2,746 IPD) SLT intervention datasets). Data on overall aphasia severity (IPD 2699;

45.5%), spoken language production (naming IPD 2,886; 48.7%; other IPD 380; 6.4%), auditory comprehension (IPD 2,750; 46.4%), functional communication (IPD 1,591; 26.8%), reading (IPD 770; 13.0%) and writing (IPD 724; 12.2%) were available for use in planned analyses. **Conclusions:** Big data in rehabilitation research is feasible while IPD enhances the insights into a highly heterogeneous population. Additionally, with sufficient IPD sample sizes, performing subpopulation stratification affords the opportunity to highlight therapy options for subgroups; a vital step towards personalizing therapeutic care and improving language recovery. The RELEASE Collaboration – author list: Marian C Brady, Myzoon Ali, Kathryn VandenBerg, Linda J Williams, Louise R Williams, Masahiro Abo, Frank Becker, Audrey Bowen, Caitlin Brandenburg, Caterina Breitenstein, Stefanie Bruehl, David A Copland, Tamara B Cranfill, Marie di Pietro-Bachmann, Pamela Enderby, Joanne Fillingham, Federica Lucia Galli, Marialuisa Gandolfi, Bertrand Glize, Erin Godecke, Neil Hawkins, Katerina Hilari, Jacqueline Hinckley, Simon Horton, David Howard, Petra Jaecks, Elizabeth Jefferies, Luis MT Jesus, Maria Kambanaros, Eun Kyoung Kang, Eman M Khedr, Anthony Pak-Hin Kong, Tarja Kukkonen, Marina Laganaro, Matthew A Lambon Ralph, Ann Charlotte Laska, Béatrice Leemann, Alexander P Leff, Roxele R Lima, Antje Lorenz, Brian MacWhinney, Rebecca Shisler Marshall, Flavia Mattioli, İlknur Maviş, Marcus Meinzer, Reza Nilipour, Enrique Noé, Nam-Jong Paik, Rebecca Palmer, Ilias Papathanasiou, Brigida F Patricio, Isabel Pavão Martins, Cathy Price, Tatjana Prizl Jakovac, Elizabeth Rochon, Miranda L Rose, Charlotte Rosso, Ilona Rubi-Fessen, Marina B Ruiter, Claerwen Snell, Benjamin Stahl, Jerzy P Szaflarski, Shirley A Thomas, Mieke van de Sandt-Koenderman, Ineke van der Meulen, Evy Visch-Brink, Linda Worrall, Heather Harris Wrigh.

#### OP4

### PAIN AND ELECTROMYOGRAPHIC IMPROVEMENTS OF CORE STABILIZATION EXERCISE AND PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION IN CHRONIC LOW BACK PAIN PATIENTS

**Pattanasin Areedumwong, PhD, Vitsarut Buttagat, PhD**  
School of Health Science, Mae Fah Luang University, Chiang Rai, Thailand

**Background:** Core stabilization exercise (CSE) and proprioceptive neuromuscular facilitation (PNF) training have been prescribed for treating chronic low back pain (CLBP), but evidences of comparison between the interventions in CLBP are still lacking. **Objective:** To compare the effects of CSE and PNF training on pain intensity and trunk muscle activity in CLBP patients. **Methods:** Forty-five CLBP patients aged 18–50 years were randomly assigned to a four-week CSE, a four-week PNF training or a control group receiving general trunk exercises. Pain intensity and activities of superficial and deep trunk muscles were evaluate before and after the finished four-week intervention. **Results:** Compared with the controls, participants in the CSE and PNF training groups showed significant improvements in pain intensity ( $p < 0.01$ ), and deep trunk muscle activity including transversus abdominis (TrA) and superficial fibres of lumbar multifidus (LM) after four-week intervention ( $p < 0.05$ ). **Conclusion:** The four-week CSE and PNF training provide short-term effects on pain intensity with increased activation of deep trunk muscle in CLBP patients.

#### OP5

### EFFECTIVENESS OF WORK-RELATED MEDICAL REHABILITATION IN PATIENTS WITH CHRONIC MUSCULOSKELETAL DISEASES

**Marco Streibelt, Dr<sup>1</sup>, Miriam Markus, Dip<sup>2</sup>, Michael Schuler, Dr<sup>3</sup>, Christian Gerlin, Dip<sup>3</sup>, Matthias Bethge, ProfDr<sup>4</sup>**

<sup>1</sup>German Federal Pension Insurance, Berlin, <sup>2</sup>University of Lübeck, Lübeck, <sup>3</sup>University of Würzburg, Würzburg, <sup>4</sup>University of Lübeck, Lübeck, Germany

**Background:** In Germany, work-related medical rehabilitation programs were developed for patients with musculoskeletal disorders. Randomized controlled trials have shown that return to work rates can be increased by about 20 points compared to common medical rehabilitation programs. To implement these programs into routine care, the Federal German Pension Insurance developed a guideline and approved several new departments. Our study was launched to assess the effects of the programs under real-life conditions. **Methods:** Participants received either a common or a work-related medical rehabilitation program. Propensity score matching was used to create balanced samples. Effects were assessed by patient-reported outcomes 10 months after completing the rehabilitation program. **Results:** We included 641 patients treated in work-related medical rehabilitation and 641 patients treated in a common medical rehabilitation program. The rate of stable return to work increased from 75 to 81 % in patients treated in work-related medical rehabilitation (OR = 1.42; 95% CI: 1.02 to 1.96). Moreover, time to return to work was decreased and self-rated work ability was slightly better ( $b = 0.38$ ; 95% CI: 0.05 to 0.72) compared to participation in a common medical rehabilitation program. Patients treated in work-related medical rehabilitation were also less depressed, had less fear-avoidance beliefs and reported better self-management skills. A per-protocol analysis including only patients with a high risk of failing return to work and patients who actually received the minimal treatment dose that is described as mandatory for all patients in the guideline for work-related medical rehabilitation revealed stronger effects in favor of work-related medical rehabilitation. **Conclusions:** Implementation of work-related medical rehabilitation in German rehabilitation centers affected work participation. Reaching patients with a high risk of failing return to work and improving the treatment consistency according to the recommendations of the work-related medical rehabilitation guideline may improve outcomes in real care.

#### OP6

### THE MONTREAL COGNITIVE ASSESSMENT: THE CUT-OFF SCORES FOR PREDICTING THE FUNCTIONAL DEPENDENCE AFTER STROKE

**Tamar Abzhandadze, MS, PhD student, Lena Rafsten, MS, PhD student, Åsa Lundgren Nilsson, PhD, Annie Palstam, PhD, Katharina S. Sunnerhagen, MD, PhD**  
Institute of Neuroscience and Physiology, Rehabilitation Medicine, University of Gothenburg, Gothenburg, Sweden

**Background and Aim:** Cognitive impairment after stroke is very common. The Montreal Cognitive Assessment (MoCA) is a commonly used screening toll, the score of  $> 26$  p (range 0–30 p) indicates normal cognitive function. Although the MoCA assessed at stroke unit is often used for predicting the need of help later after stroke, few studies have investigated correlation of early MoCA with functional outcome at later stage of stroke. The aim for the study was to identify an optimal cut-off score on the MoCA for predicting the functional dependence 3 months after stroke. **Methods:** This is a longitudinal cohort study. Clinical data from a stroke unit at Sahlgrenska University hospital were linked with the Swedish Stroke Register – Riksstroke. Cognitive function was assessed with the MoCA 36–48 h after stroke. Level of global disability 3 months after stroke was studied with mRS, calculated based on five questions from the Riksstroke. Receiver Operating Characteristic curves (AUC), sensitivity and specificity were used for identifying the optimal cut-off score on the MoCA for predicting functional dependence. **Results:** A total of 305 participants were included in the study. The mean age was 69 years at stroke onset and 126 were female. The MoCA cut-off of  $\leq 23$  points for impaired cognitive function had equally good sensitivity (70%) and specificity (65%). Thus, it was chosen as the most optimal cut-off score for predicting functional dependence 3 months after stroke. Furthermore, the MoCA cut-off of  $\leq 20$  and  $\leq 26$  had the best specificity (86%) and

sensitivity (92%), respectively for predicting functional dependence 3 months after stroke. **Conclusions:** People with a MoCA score  $\leq 23$  for impaired cognition are more likely to demonstrate functional dependence 3 months after stroke. Thus, this group might benefit from in-depth activity and cognitive assessments before discharge from the hospital and structured follow-up after discharge.

## OP7

### COMPARING THE EFFECTS OF TRADITIONAL THAI MASSAGE AND MUSCLE ENERGY TECHNIQUE ON PATIENTS WITH CHRONIC NECK PAIN ASSOCIATED WITH MYOFASCIAL TRIGGER POINTS

**Vitsarut Buttagat, PhD, Kanokwan Muenpan, BPT, Witawit Wiriyaakunphan, BPT, Saowalak Pomsuwan, BPT, Pattanasin Areudomwong, PhD**

*Department of Physical Therapy, School of Health Science, Mae Fah Luang University, Chiang Rai Province, Thailand*

**Background and Aims:** Myofascial pain syndrome (MPS) is the most common form of muscle disorders caused by trigger points located within taut bands of skeletal muscle. Traditional Thai massage (TTM) and muscle energy technique (MET) have been used to treat patients with MPS for long time but head-to-head comparisons of these interventions have not been established. The present study was aimed to investigate the effect of TTM and MET on pain, pressure pain threshold (PPT), neck disability and neck range of motion in patients with chronic neck pain associated with myofascial trigger points. **Methods:** Forty-five participants were randomly allocated into 1) TTM, 2) MET and 3) control (resting in bed, no intervention), each of which had 8 treatment sessions over a period of 2 weeks. Intensity of pain, PPT, neck disability and neck range of motion were measured before and after the intervention period. **Results:** Results indicated that both intervention groups showed a significant improvement in all parameters after 2 weeks of the treatments ( $p < 0.05$ ). Whereas, there was no significant improvement in all outcomes in control group. Moreover, group 1 and 2 were significantly higher in the improvement of all parameters when compared with group 3. **Conclusions:** TTM and MET can improve pain, PPT, neck disability and neck range of motion in this patient population.

## OP8

### PREDICTIVE VALIDITY OF THE DAILY WORK CAPACITY IN THE MEDICAL REHABILITATION REGARDING THE ACCESS TO EARLY RETIREMENT DUE TO PERMANENT WORK DISABILITY

**Uwe Egner, Math, Marco Streibelt, Dr**

*German Federal Pension Insurance, Berlin, Germany*

**Purpose:** Rehabilitation on behalf of the German pension insurance has to prevent work disability pension (WDP). In the medical rehabilitation report, a rating of the work-capacity after rehab is documented. The aim of our study was to analyze whether this can predict the claim for WDP after medical rehabilitation. **Methods:** The analysis included all medical rehabilitation measures due to musculoskeletal diseases. We used routine data of the GPI including the information of the rehab-discharge report and the work trajectories six years prior to and five years after rehabilitation. The work capacity was documented in three categories: more than 6 hours, 3 to 6 hours and less than 3 hours per day. To test the predictive validity of the daily work capacity, multiple regression models were calculated. The models were adjusted for sick leave in the year before rehabilitation, days in paid employment six years before rehabilitation and age. **Results:** We included data of 93,783 patients ( $48 \pm 8$  years). Of all patients, 1,027 (1.1%) had a documented work capacity of 3 to 6 hrs per day and 481

(0.5%) were evaluated with less than 3 hrs. In the 5-year-follow-up, 10,473 persons (11.2%) received a WDP. A reduced work capacity per day in the rehab led to a significantly higher chance of WDP (3 to 6 hrs: OR=9.23; less than 3 hrs: OR=15.28). However, only 972 of all 10,473 WDP patients could be identified (9.3%). **Conclusions:** The documented work capacity in the rehab is strongly associated to the access to early retirement due to permanent work disability in the 5-year follow-up. But compared to the WDP access rates, the proportion of patients with reduced work capacity per day in the rehab was low. The results underline the multi-complex, hardly predictable transition from active work to early retirement.

## OP9

### TRANSITION OF CARE IN PATIENTS WITH TBI – RESULTS FROM THE CENTER-TBI STUDY

**Nada Andelic, PhD**

*Department of Physical Medicine and Rehabilitation, Oslo University Hospital, Oslo, Norway*

Abstract is not available.

## OP10

### FEAR AVOIDANCE BELIEFS QUESTIONNAIRE (FABQ): DOES IT REALLY MEASURE FEAR BELIEFS?

**Cecilie Røe, PhD**

*CHARM Research Centre for Habilitation and Rehabilitation Models & Services, Institute of Health and Society, Faculty of Medicine, Oslo, Norway*

Abstract is not available.

## OP11

### VISUAL DYSFUNCTION IN ACQUIRED BRAIN INJURY: CLINICAL FINDINGS AND THEIR ASSOCIATION WITH SELF-REPORTED SYMPTOMS

**Märta Berthold-Lindstedt, PhD student<sup>1</sup>, Jan**

**Johansson, PhD<sup>2</sup>, Jan Ygge, Professor<sup>2</sup>, Kristian Borg, Professor<sup>1</sup>**

*<sup>1</sup>Department of Rehabilitation Medicine, Danderyds sjukhus, Stockholm, <sup>2</sup>Eye and vision, Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden*

**Background:** Vision is the most important tool to get information about the environment and an acquired brain injury may cause a range of visual dysfunctions having a negative impact on activities of daily life, social- and work ability. Though several reports have showed a high rate of visual impairment, these impairments are often overlooked in neurorehabilitation. One of the reasons may be the lack of cooperation between vision- and rehabilitation specialists. The purpose of this study was to estimate the frequency of vision dysfunctions with a two-folded approach, to compare a self-reported interview of visual disturbances with a measurement made by a vision specialist. **Methods:** The study was cross-sectional and included 72 patients, suffering from a medium to severe acquired brain injury, mostly caused by stroke and traumatic brain injury. The interview and vision assessment were made at the enrollment for a day-care rehabilitation period at a rehabilitation center in Stockholm, Sweden. The Visual Interview (VI) was completed by the physician and an examination made by an optometrist. **Results:** Eighty-nine per cent of the patients experienced at least one symptom where reading-related issues and a general concern about vision were most common. The most common clinical signs were related to perseverance of eye



alignment (vergence), (83%) and to flexibility (49%), i.e. functions that are important for maintaining clear vision comfortably. Chi-square and Fisher Exact tests found significant associations between symptoms and clinical signs. **Conclusion:** The VI and the visual examination both identified significant signs of visual dysfunctions but the strengths of associations between the two were moderate. This suggests that both methods are needed but probably ought to be combined to strengthen the assessment. Our future research will address how this may be incorporated.

Table 1. Associations between symptoms according to VI and clinical signs found in the visual examination

Clinical sign	
Symptom	Eye alignment (Vergence)
Visual acuity	Visual field defect
General vision concern	Phi range 0.29 – 0.41*
Double vision	Phi 0.26**
Affected visual field	Phi 0.34**    Phi 0.49***
Problems recognizing faces	Phi 0.29*
Frequently bumping into people/objects	Phi 0.30*

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

## OP12

### IN HOSPITAL AT HOME. SERVICE INNOVATION WITH FOCUS ON INTERDISCIPLINARY COLLABORATION

**Ingebjørg Irgens, Cand. med.**

Sunnaas Rehabilitation Hospital, Nesoddtangen, Norway

**Aim:** Present an effective and less time consuming follow-up treatment for individuals with spinal cord injury and pressure ulcer. **Method:** The outpatient follow-up in a hospital versus from the patient's home using telemedicine interventions, are compared, measuring the healing, changes in quality of life, cost-benefit and the patient satisfaction. **Results:** The results from a newly terminated study will be presented. **Conclusion:** The results might influence future guidelines for outpatient treatment of conditions in need of interdisciplinary time consuming follow-up.

## OP13

### HIGH-LEVEL MOBILITY AFTER AN ANEURYSMAL SUBARACHNOID HAEMORRHAGE

**Ludvig Toftedahl, PT, Master's degree<sup>1</sup>, Tanja Karic, MD, PhD<sup>2</sup>, Kristin Heier Johansen, PT, Master's degree<sup>2</sup>, Angelika Sorteberg, MD, PhD<sup>3</sup>, Ingerid Kleffegård, PT, PhD<sup>4</sup>, Helene Lundgaard Søberg, PT, PhD<sup>5</sup>**

<sup>1</sup>Department of Rehabilitation, The municipality of Strömstad, Sweden

<sup>2</sup>Department of Physical Medicine and Rehabilitation, Oslo University Hospital, Norway <sup>3</sup>Department of Neurosurgery, Oslo University Hospital, Norway and University in Oslo, Norway <sup>4</sup>Department of Physical Medicine and Rehabilitation, Oslo University Hospital, Norway <sup>5</sup>Department of Physical Medicine and Rehabilitation, Oslo University Hospital, Norway and Faculty of Health Sciences, Oslo Metropolitan University, Norway

**Background and Aims:** Mobility is an important factor in daily life and a common disability after stroke, but the relationship between mobility and aneurysmal subarachnoid haemorrhage (aSAH) remains unclear. The aim was to examine high-level mobility 3 and 12 months after an aSAH, assess changes in mobility, and examine which variables predicted mobility 12 months after an aSAH. **Methods:** The study was a longitudinal cohort study of all aSAH patients admitted to the neuro-intermediate ward at Oslo University Hospital, Oslo in 2011–2012. Demographic data and aSAH characteristics were collected from the patients' medical records and questionnaires. Mobility were tested with

the High-level mobility assessment tool (HiMAT) (scores 0 [worst] to 54 [best]) and the patients' scores were compared to HiMAT normative values. **Results:** 125 patients (66% women), mean age 53 (SD 10.4) years were tested 3 and 12 months post injury. 70 patients performed both follow-ups. 82 patients performed only the 3-month follow-up and 113 patients performed only the 12-month follow-up. 91 of the patients (73%) who performed HiMAT had good grade World Federation of Neurological Surgeons (WFNS) score, WFNS score 1–2, at ictus. Mean total HiMAT score at 3 months was 32.6 (SD 9.3) points and 34.8 (SD 9.9) points at 12 months, which is lower than the normative values for HiMAT ( $p < 0.001$ ). Mobility changed 1.8 points between 3 and 12 months ( $p = 0.03$ ), which is less than the minimal detectable change. Patients with severe aSAH had greater progress in the HiMAT score from 3 to 12 months ( $p = 0.017$ ). Lower age predicted better mobility at 12 months for patients after an aSAH ( $B = -0.34$ ,  $R^2 = 0.21$ ,  $p < 0.001$ ). **Conclusion:** Patients with an aSAH had lower mobility performance at 3 and 12 months post-injury compared to the normative values and a small improvement between 3 and 12 months. Higher age was negatively associated with mobility at the 12-month follow-up.

## OP14

### DEPENDENT ON FUNCTIONAL DEPENDENCY AT DISCHARGE; DIFFERENT PREDICTORS ARE IMPORTANT FOR OUTCOME AFTER STROKE

**Hanna C. Persson, PhD, Daniel Hörsell, MD, Emma Westerlind, MD, PhD student**

Institute of Neuroscience and Physiology, Department of Clinical Neuroscience, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden

**Background and objectives:** Level of dependency after a stroke is important for long-term outcome in several aspects, but less is known about important predictors for outcome depending on functional dependency. The aim of the current study was to investigate self-perceived outcome and identify possible predictors of strength, participation, and emotional outcome five years after stroke based on functional dependency at discharge from hospital. **Materials & Methods:** This observational cohort study included participants living in Gothenburg that were diagnosed with first ever stroke in 2009 and 2010. Baseline data were gathered from medical charts and the outcome was based on the Stroke Impact Scale (SIS) questionnaire mailed out five years post-stroke. Logistic regression identified potential predictors of better strength, participation, and emotional outcome. **Results:** A total of 266 participants responded to the SIS. The functionally independent participants at hospital discharge reported significantly better scores in all SIS domains compared to the functionally dependent. For those who were functionally independent, only non-modifiable factors (age, sex, stroke type) were significant predictors of a better outcome. However, for the functionally dependent participants, modifiable factors such as feeling depressed, cardiovascular risk factors, and recurrent stroke were significant predictors of unfavourable outcome. **Conclusions:** Important factors for predicting a favourable outcome differed due to the level of functional dependency, and modifiable factors were only present in participants that were functionally dependent at discharge. Prevention, detection, and treatment of modifiable factors give an opportunity to reduce the burden of stroke for those who are most vulnerable.

## OP15

### THE DESCRIPTION OF HEALTH-RELATED REHABILITATION SERVICE PROVISION AND DELIVERY IN RANDOMIZED CONTROLLED TRIALS. A TOPIC REVIEW

**Nada Andelic, Prof, PhD<sup>1</sup>, Juan Lu, Prof, PhD<sup>2</sup>, Christoph Gutenbrunner, Prof, PhD<sup>3</sup>, Boya Nugraha, PhD<sup>3</sup>, Cecilie Røe, Prof, PhD<sup>1</sup>**

<sup>1</sup>University of Oslo, Research Centre for Habilitation and Rehabilitation <sup>2</sup>Virginia Commonwealth University, Department of Family Medicine and Population Health <sup>3</sup>Hannover Medical School, Dept. Rehabilitation Medicine, Hannover, Germany

**Background:** The recently developed International Classification System for Service Organization in Health-Related Rehabilitation (ICSO-R 2.0) intends to define uniform criteria to describe and classify rehabilitation services. To advance the service delivery, an understanding of how ICSO-R may be applied in rehabilitation research is fundamental. **Aim:** To compare rehabilitation service descriptions in recently completed randomized controlled trials (RCTs) with the uniformed criteria and classification dimensions proposed by ICSO-R 2.0. **Methods:** A Medline search was performed between January and December 2018 among indexed English language studies to identify eligible RCTs. All RCTs were eligible if the primary goal was to provide rehabilitation and trial report included descriptions of provision and delivery of rehabilitation services. We excluded studies from hospitals or other organizational units that did not provide rehabilitation services as primary goals. A standardized protocol has been developed to extract relevant information regarding service descriptions and compare them to two dimensions and corresponding categories as proposed by ICSO-R 2.0. Descriptive analysis will be used to summarize the data. The Provider dimension is defined as organizational units with the primary goal of providing rehabilitation services, including categories of Context, Ownership, Location, Governance/Leadership, Quality Assurance and Management, Human Resources, Technical Resources, Funding and Other categories of Provider. The Service Delivery dimension is defined as offer of set of products (interventions, procedures, devices, pharmaceuticals, etc.) to a specific group of individuals (patients, informal caregivers, and/or other users and clients) aiming at achieving or maintaining optimal functioning within an organizational context. This dimension describes characteristics of service delivery including Health Strategies, Service Goals, Target Groups, Modes of Referral, Location of Services Delivery, Facility, Setting, Integration of Care, Patients-Centeredness, Aspects of Time and Intensity; Rehabilitation Team, Reporting and Documentation, Funding of Service Delivery, and Other Categories of Service Delivery. **Preliminary Results:** Overall, 96 RCTs have been identified; 16 were excluded by title, and 37 by abstract. The remaining 43 studies to be screened by full-text cover different organizational units and target groups (neurological disabilities, musculoskeletal conditions, heart diseases, diabetes and elderly). The final review results will be presented at the conference.

## OP16

### LONGITUDINAL STUDY OF POSTURAL BALANCE CHANGES IN PEOPLE WITH STROKE

**Dongni Johansson, PhD student, Lena Rafsten, PhD student, Katharina S. Sunnerhagen, MD, PhD**

Rehabilitation Medicine, Department of Clinical Neuroscience, Institute of Neuroscience and Physiology, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden

**Background:** Longitudinal changes in postural balance can be useful to evaluate fall risk for stroke patients. The aim of this study was to investigate postural balance changes in stroke patients over one year. **Method:** The longitudinal data is a subset of a large project (Gothenburg Very Early Discharge) conducted in a randomized controlled design with blinded assessors. The static postural balance was assessed using Berg Balance Scale and dynamic balance was assessed with Time Up and Go test. Longitudinal changes were analyzed using mixed effect time-varying-effect models with SAS macro, across five different occasions: five days after onset, within 24 hours after discharge, one month, three months and one year after stroke onset. Demographic characteristics were recorded and cognitive function, dependence in activities of daily living, stroke severity and motor function were also assessed. Preliminary results One hundred-forty participants (median age 76 years, range 37–96, 55 female [39%]) were included in the analysis. There were significant improvements

of postural balance within 24 hours after discharge and between one and three months post stroke. Postural balance stabilized one month after stroke onset. Higher age, dependency and decreased lower extremity motor function had negative impact of static and dynamic postural balance over time. **Conclusions:** More individual tailoring and a long-term rehabilitation schedule focused on balance training are desirable. Those who are older have particular needs. A better knowledge of postural balance change over time would facilitate a prediction of fall risk and adjustment of rehabilitation training in term of intensity and volume.

## OP17

### PATIENTS FUNCTIONING 2 MONTHS AFTER MILD-TO-MODERATE TBI

**Emilie Isager Howe, Cand Psych<sup>1</sup>, Silje C. R. Fure, MD<sup>1</sup>, Marianne Løvstad, PhD<sup>2</sup>, Torgeir Hellström, MD, PhD<sup>1</sup>, Nada Andelic, MD, PhD<sup>1</sup>**

<sup>1</sup>Department of Physical Medicine and Rehabilitation, Oslo University Hospital, Oslo, <sup>2</sup>Sunnaas Rehabilitation Hospital, Nesoddtangen, Norway

Abstract is not available.

## OP18

### HOME-BASED STROKE REHABILITATION SERVICE EVALUATION

**Aija Voitkevica, M.H.Sc. (To be awarded 2019 June)<sup>1</sup>, Guna Berzina, PhD<sup>2</sup>**

<sup>1</sup>Health Center 4, Riga, Latvia, <sup>2</sup>Riga Stradins university, Riga, Latvia

**Objective:** There has been much attention given recently to rehabilitation service evaluation using systemic approach, thus enhancing gathering of internationally comparable information, also for rehabilitation services delivered at home. There has been special classification system for evaluating rehabilitation services developed – ICSO-R Classification system. Home-based rehabilitation (HBR) services for stroke patients have been available in Latvia for seven years, though there is very little known about organisation of service delivery. Aim of the study Evaluation of service provider, funding and service delivery dimensions between various HBR for stroke patients service providers in Latvia by using ICSO-R Classification system and defining barriers and facilitators in HBR for stroke patients service delivery. **Methods:** Qualitative study, including five service provider focus group (functional specialists, PRM doctors and/or nurse) discussions and four individual interviews (physiotherapists, PRM doctors) carried out in every statistical region in Latvia. Semi-structured interview questions were developed on the basis of ICSO-R dimensions and categories. Qualitative content analysis and thematic analysis were chosen for data analysis. **Results:** Rehabilitation specialists participated from four regional health care institutions in Kurzeme, Zemgale and Riga, from two local institutions in Latgale and Vidzeme and from one nationwide rehabilitation institution in Pieriga region. After carrying out thematic analysis there were four main service delivery barriers and facilitatory factors identified – time, patients and relatives, finances and the environmental factors, there were also several subthemes for each of the main themes. **Conclusion:** This qualitative study showed that almost every category of the ICSO-R service provider, service delivery and funding of the service has been covered in all of the service providers, though the differences in service delivery between service providers are attributable to organisational factors and the availability of functional specialists in different regions of Latvia. The barriers of service delivery are the time spent for transfer and documentation; financial factors, such as not compensated travel expenses and insufficient remuneration. As facilitative factors the compliance of the patient and relatives is mentioned. In addition, environmental factors, such as safety aspects



cts and rehabilitation possibilities are also important. Key words: Stroke rehabilitation; Delivery of rehabilitation service; ICSO-R; home-based rehabilitation.

## OP19

### THE EFFECTIVENESS OF VIDEO-GUIDED EXERCISE AFTER A STROKE

**Madeleine Kenny, PT, BSc, Rory O'Connor, MD**

*Leeds Teaching Hospitals Trust/The University of Leeds, Leeds, West Yorkshire, UK*

**Background and aims:** Finding practical ways to help people with stroke to develop skills in exercising independently early in their recovery could allow opportunities for a greater intensity of therapy to be received, and sow the seeds of later self-management. This study investigates the feasibility and acceptability of using individualised video guides on a computer tablet to help hospitalised people with stroke practise their prescribed arm exercises outside of therapy sessions. **Methods:** This is single-blind pilot randomised control feasibility study with an embedded qualitative study, carried out on the stroke wards in a large UK teaching hospital. Fourteen participants were recruited (new stroke diagnosis), eleven completed the study. Participants were randomised to either a treatment as usual or intervention group. The intervention group were provided with a computer tablet, upon which their prescribed tailored arm exercises had been filmed during their therapy sessions. They then used the guide to practise outside of therapy sessions. The main outcome measure was the Motor Status Scale for upper limb. This was used to calculate sample sizes for a powered study. Data on recruitment and retention, time exercising in and out of therapy, movement quality, self-efficacy and the experience of the therapists (Focus group) and patient participants (interviews) were collected. **Results:** The outcome measures used showed utility in this trial, except for time spent exercising and self-efficacy. Recruitment rate was 1 patient participant /week. Using a minimal clinically significant difference of five, 92 patients/group would need to be recruited for a powered study. Patient and physiotherapy participants found the intervention acceptable, but the needs for motivation and support to exercise were highlighted. **Conclusions:** A video-guided exercise after stroke trial is feasible to deliver. Potential changes to design, outcome measures, eligibility criteria and the intervention itself were all informed by this study.

## OP20

### PRE-STROKE PHYSICAL ACTIVITY COULD AFFECT COGNITION EARLY AFTER STROKE

**Malin Reinholdsson, MSc<sup>1</sup>, Katharina S. Sunnerhagen, MD, PhD<sup>2</sup>, Annie Palstam, Med Dr, PhD, PT<sup>2</sup>**

*<sup>1</sup>Institute of Clinical Neuroscience and physiology, Sahlgrenska Academy, Gothenburg, <sup>2</sup>Department of Clinical Neuroscience at Institute of Neuroscience and Physiology, University of Gothenburg, Sweden*

**Background and aims:** Physical inactivity is a global pandemic. Physical activity (PA) is known to prevent stroke while the effects of PA on the different consequences after stroke are uncertain. In a previous study we showed that older age and physical inactivity could result in a more severe stroke. In this project the aim is to see if PA and other predictors could affect cognition early after stroke. This research is important since post-stroke cognitive impairment (PSCI) is one of the most common symptoms after stroke and no similar study has been done. **Methods:** This is a cross-sectional study design, based on data

from Swedish stroke registries. Predictors were age, sex, smoking, diabetes, prestroke PA, atrial fibrillation, previous TIA and protective treatments such as statin or hypertension treatments while the main outcome was PSCI assessed with Montreal Cognitive Assessment (MoCA). Prestroke PA was assessed with Saltin-Grimby Physical Activity Level Scale. Logistic regression analyses were performed. **Results:** Adult patients with first stroke admitted to Sahlgrenska University Hospital in Gothenburg 2014-2018, were included in the study. **Preliminary Results:** The study population was 1,297 patients, 42% women with a mean age of 71 years. Ischemic stroke was more common (93%), 87% of the patients had a mild stroke. Almost half of the patients, 42% were inactive and 43% had PSCI with 25 or less points when assessed with MoCA. Regression analysis showed that light PA (OR=1.65), moderate and high PA (3.81), younger age (OR=0.96), no diabetes (OR=0.58) and no atrial fibrillation (OR=0.54) could predict preserved cognitive function after stroke. **Conclusions:** This study suggests that PA and younger age could result in preserved cognitive function. In this study, PA such as walking at least 4 hours/week was beneficial although exercise 2-3times/week seems to be even more effective.

## OP21

### PROVISION OF A MULTI-PROFESSIONAL HEALTH-RELATED REHABILITATION SERVICE IN DAY HOSPITALS IN THE RIGA TERRITORIAL UNIT

**Liga Korosevska, Master's<sup>1</sup>, Guna Berzina, PhD<sup>2</sup>**

*<sup>1</sup>Korosevska Liga - Physiotherapist Practice, Riga, Latvia <sup>2</sup>Riga Stradins University, Riga, Latvia*

**Background:** Global demographic and epidemiological trends indicate that there is a growing need for rehabilitation worldwide. To gradually achieve equal access to high-quality health-related rehabilitation services, it is necessary to develop comprehensive service delivery models. Hence, existing services should be compared at regional, national and international level. **Aim:** to describe and compare by content the provision of multi-professional health-related rehabilitation service in day hospital in the Riga territorial unit by using the ICSO-R classification system. **Methods:** Qualitative research – deductive content analysis approach. Eight medical institutions of the Riga Territorial Unit, which provide the service in day hospital, participated in the study. Document analysis was carried out: Republic of Latvia Cabinet Regulation No. 555 and analysis of medical records in 3 medical institutions. Eight semi-structured interviews were conducted with persons responsible for organizing and coordinating the service. A data analysis matrix was created in accordance to ICSO-R. The results were collated in structured tables and compared by content. **Results:** According to the ICSO-R classification system, the service in day hospital in the Riga territorial unit is funded by state in various organization and context medical institutions, to children and/or adults with acute, subacute and chronic functional limitations as a basic or intensive rehabilitation course aimed at improving the body functions and activity and participation. The service is provided by a multi-professional rehabilitation team involving the user and often his family or assistants and carers in the rehabilitation process. **Conclusions:** The multi-professional health-related rehabilitation service is provided similarly in the 8 day hospitals in the Riga territorial unit. Its provision does not differ substantially from the Republic of Latvia Cabinet Regulations No. 555, but there are inconsistencies in service delivery target group and intensity. The ICSO-R classification system is suitable for description and comparison of the service provision, though certain categories and subcategories should be further adjusted.

## OP22

**KINEMATIC MOVEMENT ANALYSIS OF UPPER EXTREMITY IN PERSONS WITH SPINAL CORD INJURY**

**Lamprini Lili, PhD student, Katharina S. Sunnerhagen, Professor, chief physician, Margit Alt Murphy, PhD, Associate Professor**

*Institute of Neuroscience and Physiology, Rehabilitation medicine, Sahlgrenska Academy, University of Gothenburg, Sweden*

**Background and aims:** Upper extremity (UE) function is highly prioritized by persons with spinal cord injury (SCI) and has a central role in rehabilitation. However, despite the plethora of outcome measures available, kinematic analysis is seldom used as measurement in SCI. The present study will measure movement performance and quality during a daily task using kinematic analysis in individuals with established SCI. **Methods:** In total 28 individuals (20 males, 8 female, mean age 58 years) with tetraplegia ( $n=17$ ) and paraplegia ( $n=11$ ) along with age- and gender-matched 54 healthy controls. Among individuals with SCI, 15 had complete (AIS A and B) and 13 incomplete (AIS C and D). Kinematic analysis of drinking task was performed unimanually with both hands. Measures of movement speed, smoothness, and joint and trunk displacements were calculated. Participants with SCI were categorized as having full ( $n=18$ ) or limited ( $n=10$ ) UE function according to Action Research Arm Test. **Results:** The preliminary results show that kinematic variables of movement time, smoothness, trunk displacement, arm abduction during drinking and elbow angular velocity in reaching were significantly different in those with limited UE function compared to healthy controls. Kinematic variables in those with full UE function (ARAT=57 pts) were not different from controls. **Conclusions:** Results from this study show that kinematic analysis of UE function during a common daily task is sensitive to identify specific deficits in movement performance and quality in individuals with limited UE function after SCI. Further studies are needed to more closely define the clinical significance of these UE limitations and how kinematic analysis can be employed to guide goal setting, treatment evaluation and selection in SCI rehabilitation.

## OP23

**INTENSIVE AUGMENTED SPEECH-LANGUAGE THERAPY FOR POST STROKE APHASIA DELIVERED BY TELEREHABILITATION – A PRAGMATIC PILOT RANDOMIZED CONTROLLED TRIAL**

**Hege Prag Ora, MD<sup>1</sup>, Melanie Kirmess, PhD<sup>2</sup>, Marian Brady, PhD<sup>3</sup>, Frank Becker, MD<sup>1</sup>**

*<sup>1</sup>Sunnaas Rehabilitation Hospital, Nesoddtangen, Norway & University of Oslo, Institute of Clinical Medicine, Oslo, <sup>2</sup>Sunnaas Re-*

*habilitation Hospital, Nesoddtangen, Norway & University of Oslo, Department of Special Needs Education, Oslo, Norway, <sup>3</sup>Nursing, Midwifery and Allied Health Professions Research Unit, Glasgow Caledonian University, Scotland*

Abstract is not available.

## OP24

**DECISION-MAKING PROCESS IN THE SELECTION OF MOBILITY ASSISTIVE DEVICES IN THE LATVIAN CONTEXT**

**Zoya Osipova, MHSc<sup>1</sup>, Signe Tomson, PhD<sup>2</sup>**

*<sup>1</sup>National rehabilitation center VAIVARI, Jurmala, Latvia/Faculty of Rehabilitation Riga Stradins University Riga Latvia <sup>2</sup>Faculty of Rehabilitation Riga Stradins University, Riga, Latvia*

**Topicality:** Mobility devices designed to facilitate or enhance a user's personal mobility – this relates to their ability to change and maintain body position and walk and move from one place to another. Mobility assistive devices encourage participation in daily activities and public life. The United Nations Convention on the Rights of Persons with Disabilities emphasizes the responsibility of states to take effective measures to ensure access to personal mobility devices. **Aim:** Describe the factors and their interactions that affect the choice of mobility assistive device. **Design:** Qualitative study using a grounded theory approach. **Participants:** The study involved 37 participants experienced in the decision-making process on the selection of mobility assistive device. Sixteen specialists were involved, including functional specialists, six occupational therapists, three physiotherapists, four physical medicine and rehabilitation physicians, and three primary care physicians. Twelve people represented mobility assistive device users. Nine people represented assistive device providers. Providers represented both groups from the public and private sectors. **Methods:** In study were conducted eight focus group discussions with semi-structured content. **Results:** Twelve categories have been created after analysing discussions content. Common categories for all involved participants is specialist's competencies, feedback and perception of collaboration. Health care providers involving in decision-making process characterized by categories of evaluation process, access to assistive devices. User's group characterized by categories of disability experience, factors affecting choice. Providers divided in two groups – public and private. Provision of assistive devices in a public sector characterized by determination of eligibility, budgetary dependency and specialist's responsibility. Private sector characterized by determination of eligibility and impact of the financial aspect. **Conclusions:** The decision-making process on the selection of mobility assistive devices affected by a national system of technical aids. Collaboration of health care specialists and providers is only effective with knowledgeable, experienced or interested user. Multiple functional disorders, especially cognitive disorders, make decision-making process more complicated. All of the participants pointed out the lack of feedback. There is a lack of competence between professionals at different levels of health and social care.

## POSTER ABSTRACTS

## PP1

# IMPROVEMENT OF MOBILITY OF PATIENTS WITH SPINAL CORD INJURY IN C4–C8 SEGMENTS BASED ON THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH

**Laura Gulbinaitė, MD<sup>1</sup>, Aušra Adomavičienė, PhD<sup>2</sup>, Evelina Narutytė, MD<sup>3</sup>, Alvydas Juocevičius, Prof. (HP)<sup>2</sup>**

<sup>1</sup>Physical Medicine and Rehabilitation Department, Klaipėda Seamen's Hospital, Klaipėda, <sup>2</sup>Rehabilitation, Physical and Sports Medicine Center, Vilnius University Hospital Santaros Klinikos, Vilnius, <sup>3</sup>Medical SPA „Eglės sanatorija“, Druskininkai, Lithuania

**Background:** Spinal cord injury (SCI) affects all body functions below the level of the neurological lesion. That causes medical disorders and loss of functions, independence and physical activity in daily and social life. The International Classification of Functioning, Disability and Health (ICF) is the universally accepted conceptual model for the description of functioning. **Aims:** To evaluate patients' with spinal cord injury independence and participation in activities of daily living, to identify the most common difficulties of mobility and assess their change during inpatient rehabilitation. **Methods:** Prospective analysis of patients who were treated in inpatient rehabilitation unit after SCI. 25 patients (22 (88.0%) men and 3 (12.0%) women) with spinal cord injury in C4 – C8 segment level were evaluated. The inpatient rehabilitation program lasted an average of 123.1 ± 12 days. Functional problems were assessed by the Comprehensive ICF Core Set for SCI at the beginning and at the end of rehabilitation. **Results:** All patients (100%) had complete (4 points) or severe (3 points) mobility impairment in the beginning of rehabilitation. Improvement of mobility was observed in almost half (up to 47.7%) of patients ( $p < 0.001$ ) at the end of inpatient rehabilitation, moderate or mild severity in mobility predominated. **Conclusions:** There was significant improvement of mobility in patients' with cervical spinal cord injury after treatment in inpatient rehabilitation unit (mostly moderate or minimum need of assistance remained).

## PP2

# PARTICIPATION AND AUTONOMY FIVE YEARS AFTER STROKE: A LONGITUDINAL OBSERVATIONAL STUDY

**Annie Palstam, PhD, Astrid Sjödin, MSc, Katharina S. Sunnerhagen, professor**

*Institute of neuroscience and physiology, Department of clinical neuroscience, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden*

Stroke is the second most common cause of disability in the world. The purpose of this study was to evaluate the participation and autonomy of persons with stroke, five years after a stroke, and to explore potential associations between factors and perceived restrictions in participation and autonomy. **Methods:** This five-year follow-up survey study included individuals diagnosed with a first-time stroke during 2009–2010, in Gothenburg. The survey included the Impact of Participation and Autonomy-questionnaire (IPA-E), which comprised five domains: Autonomy Indoor, Family Role, Autonomy Outdoor, Work & Education, and Social Life & Relationships. Logistic regression analyses were used to analyze factors associated with participation restrictions. **Results:** At 5 years after a stroke, 457 patients were alive; of these, 281 responded to the follow-up survey. Participation

restrictions were most pronounced in the IPA-E domains of Autonomy Outdoors, Work/Education, and Social Life and Relationships. In contrast, restrictions were less pronounced in the IPA-E domains of Autonomy Indoors and Family Role. Severe stroke, older age, and female sex predicted participation restrictions at five years after a stroke. Participation restrictions were partly explained by feelings of depression at five years after stroke. Problems associated with participation restrictions were most frequently observed in the areas of mobility, leisure, and help/support from other people. In conclusion, this study showed that participation and autonomy were restricted among persons with stroke at five years after the stroke. The domains perceived as most restricted were those that required high levels of physical, social, and cognitive abilities.

## PP3

# ANALYSIS OF DAILY PHYSICAL ACTIVITIES BY COMBINATION ACCELEROMETER AND DIARY MONITORING DATA: FEASIBILITY STUDY IN TWO DIFFERENT POPULATIONS

**Lina Butane, PhD Student<sup>1,2</sup>, Daina Smite, Dr.med.<sup>2</sup>, Andris Skride, Dr.med.<sup>1,2</sup>**

<sup>1</sup>P.Stradins Clinical University Hospital (Riga/Latvia); Riga Stradins University, Faculty of Rehabilitation (Riga/Latvia) <sup>2</sup>Riga Stradins University, Faculty of Rehabilitation (Riga/Latvia)

**Background:** Physical activities is natural and essential part of human life. Purposeful activities are one of the most important, safest and cost-effective treatment options, and has been shown to be beneficial in a wide range of diseases, and also strongly recommended in healthy population. To foster participation in daily physical activities is essential goal both in health promotion as well fundamental part of successful functional recovery during rehabilitation. Most frequently monitored data about level of physical activities are number of steps and covered distance, but the necessity to use more specific instruments and ability to detect different motions/movements, for example, in persons with severe functional limitations and/or chronic disease is growing. Along with quantitative data collection analysis of diaries about activities kinds (daily habits), subjective experience and environmental influences gives more comprehensive view. **Aim:** Test feasibility of combination accelerometer and diary monitoring data in analysis in two distinct population – persons with chronic disease (COPD) and healthy school age children. **Methods:** We carried feasibility study to test opportunities in analysis of daily physical activities by the developed methodology and to test acceptability of wearable motion sensor (accelerometer) in two dissimilar populations. We used multiple case study design. Participants were selected purposely: 4 COPD patients and 4 healthy school age children (age 12–13). In COPD patients were analyzed 7 consecutive days, in children – 4 weekends. The assessment instruments were: accelerometer (we established cooperation with Maastricht University and used their instrument - MOX Physical Activity Monitor) and patient's diary (it was distributed by hours and included type of activity, self-feeling, environment). At the end of the study, patients completed survey about the applicability of accelerometer. **Results:** The results approved that combined data monitoring allowed to analyze time (minimal unit - second) and time ratio spent in each activity level for each day (total and awake time), types of daily activities and their saturation based ratio of its intensity, time spent in each activity. Questionnaire results support appropriate applicability (with only one participant recorded irritation to the skin under sensor). **Conclusions:** The tested methodology with combination accelerometer and diary monitoring data is feasible tool to analyze daily physical activities that allows to develop individualized interventions to improve participation in optimal physical activities.

## PP4

**COGNITIVE FATIGUE AFTER AN ACQUIRED BRAIN INJURY CAUSES A LOWER HEALTH-RELATED QUALITY OF LIFE****Elisabeth Åkerlund, PhD student, Hanna C.****Persson, Med Dr. PhD. Psysioterapist, Katharina S.****Sunnerhagen, Professor, MD, PhD***Rehabilitation Medicine, Department of Clinical Neuroscience, Institute of Neuroscience and Physiology, the Sahlgrenska Academy, University of Gothenburg, Sweden*

**Background and Aims:** Cognitive fatigue, emotional distress and executive dysfunctions are common consequences after an acquired brain injury (ABI), limiting activity and participating. Adequate treatment is imprecise. The aims of this study were to investigate the impact of cognitive fatigue after an ABI in health-related quality of life (HRQoL) as well as in relation to executive functioning and emotional status. **Methods:** Outpatients at the rehabilitation clinic, with an identified working memory problem, were assessed with the WAIS-III working memory tests together with the self-rating scales:

Fatigue Impact Scale (FIS), Dysexecutive Questionnaire (DEX), Hospital Anxiety and Depression Scale (HADS) and the dimension of health-related quality of life (HRQoL) EQ-5D-3L. Descriptive statistics, correlations and a logistic regression with HRQoL as the dependent variable was used. **Results:** The study included 41 patients (22 women), median age 51 years. Stroke was the most common diagnose ( $n=31$ ), followed by trauma ( $n=5$ ) and other diagnoses ( $n=5$ ). Median time since ABI was 8 months. Cognitive fatigue was reported by 90%, executive dysfunctioning 48%, anxiety 39% and depression 25%, while 93% perceived a lower HRQoL than average. Cognitive fatigue correlated on a moderate level with depression, (0.579) and executive dysfunctioning (0.555). Moderate correlations were also seen between executive functioning and anxiety (0.603) resp. depression (0.631), and between anxiety and depression (0.699). In the regression analysis, cognitive fatigue was the only significant factor with impact on HRQoL. **Conclusion:** These results strengthens the understanding of cognitive fatigue as a common consequence after an ABI and a direct partial cause to a lower HRQoL. Less than half of the group reported emotional distress while experienced HRQoL was seen low. The moderate correlations between cognitive fatigue and depression resp. executive dysfunctioning stresses the fatigue problem. Thus, understanding and handling cognitive fatigue should be in focus in rehabilitation after an ABI.



## Author Index

### A

Abzhandadze, Tamar 8  
Adomavičienė, Aušra 14  
Alt Murphy, Margit 13  
Andelic, Nada 10, 11  
Areeudomwong, Pattanasin 8, 9  
Augutis, Marika 7

### B

Bautz-Holter, Erik 7  
Becker, Frank 7, 13  
Berthold-Lindstedt, Märta 9  
Berzina, Guna 6, 11, 12  
Bethge, Matthias 8  
Borg, Kristian 6, 9  
Brady, Marian 13  
Butane, Lina 14  
Buttagat, Vitsarut 8, 9

### D

Dalen, Håkon 7  
Deboussard, Catharina 6

### E

Egner, Uwe 9

### F

Fure, Silje C. R. 11

### G

Gerlin, Christian 8  
Granlund, Mats 5  
Grimby, Gunnar 4  
Gulbinaitė, Laura 14  
Gutenbrunner, Christoph 6, 10

### H

Hellström, Torgeir 11  
Höfers, Wiebke 7  
Hörsell, Daniel 10  
Howe, Emilie Isager 11

### I

Irgens, Ingebjørg 10

### J

Johansen, Kristin Heier 10  
Johansson, Dongni 11  
Johansson, Jan 9  
Jørgensen, Vivien 7  
Juocevičius, Alvydas 14

### K

Karic, Tanja 10  
Kenny, Madeleine 12  
Kirmess, Melanie 13  
Kleffeldgård, Ingerid 10  
Korosevska, Liga 12

### L

Lili, Lamprini 13  
Löfgren, Monika 4  
Løvstad, Marianne 11  
Lu, Juan 10  
Lundgaard Søberg, Helene 10  
Lundgren Nilsson, Åsa 8

### M

Maanum, Grethe 5  
Markus, Miriam 8

### N

Narutytė, Evelina 14  
New, Peter 7  
Norup, Anne 4  
Nugraha, Boya 6, 10  
Nyquist, Astrid 7

### O

O'Connor, Rory 12  
Ora, Hege Prag 13  
Osipova, Zoya 13

### P

Palstam, Annie 8, 12, 14  
Persson, Hanna C 10, 15  
Preede, Line 7

### R

Rafsten, Lena 8, 11  
Rasmussen, Mari 4  
Reinholdsson, Malin 12  
Røe, Cecilie 7, 10

### S

Sällström, Susanne 7  
Schuler, Michael 8  
Sjödin, Astrid 14  
Skavberg Roaldsen, Kirsti 7  
Skride, Andris 14  
Smite, Daina 14  
Søberg, Helene 7  
Sorteberg, Angelika 10  
Stam, Henk 4, 6  
Stanghelle, Johan 7  
Streibelt, Marco 8, 9  
Sunnerrhagen, Katharina S. 4, 8, 11, 12, 13, 14, 15  
Sveen, Unni 4

### T

Toftedahl, Ludvig 10  
Tomsone, Signe 13

### V

van de Velde, Dominique 5  
Voitkevica, Aija 11  
Westerlind, Emma 10  
Winter, Laraine 4  
Wiriyasakunphan, Witawit 9

### Y

Ygge, Jan 9

### Å

Åkerlund, Elisabeth 15