Abstract book

Joint Congress of the DCRM, BNF-PRM and RBSPRM 2017

9 and 10 November 2017 - MECC Maastricht, The Netherlands

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BNF PRM
Baltic & North Sea Forum on PRM

DCRM
Dutch Congress of Rehabilitation Medicine

NSRM
NETHERLANDS SOCIETY OF REHABILITATION MEDICINE

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15.35 – 16.15	**Poster walk and exhibition: networking break**	
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FRIDAY 10 NOVEMBER

07.30 – 08.30 **Registration of the participants**

08.30 – 10.00	**Parallel Session 3: Workshops and mini-symposia**	
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10.00 – 10.45 **Coffee break and exhibition: Networking Break**

10.45 – 11.45	**Parallel Session 4: Debate and PhD thesis session**	
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4b.	Debate: Moving ahead towards participation?	**0.4 + 0.5**

11.50 – 12.30 **KEYNOTE LECTURE: Wilma van der Slot MD PhD** **Auditorium**
Growing older with cerebral palsy: lifelong challenges for patients and providers

12.30 – 13.30 **Poster walk and exhibition: Networking Lunch Break**

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15.00 – 15.45 **Poster walk and exhibition: Networking Break**

15.45 – 16.00 **Awarding best PhD thesis 2017, best presentation and best poster** **Auditorium**

16.00 – 16.20	**KEYNOTE LECTURE: Best abstract presentation**	**Auditorium**
16.20 – 17.00	**KEYNOTE LECTURE: Prof. Yves Vandermeeren MD PhD** *Implementing motor learning and tDCS in stroke neuro-rehab*	**Auditorium**
17.00	**Closing of the congress**	**Auditorium**

Keynote Lectures

Thursday 9 November

FRIDAY 10 NOVEMBER

Jacqueline Kool

Thursday 9 November, 10.10 – 10.50

Moving towards the right to participate?

Chair: prof. Coen van Bennekom MD PhD

Summary

In 2016 the Dutch government finally ratified the United Nations Convention on the Rights of Persons with Disabilities (CRPD). This convention aims at full inclusion and participation of people with disabilities at all live domains, presenting participation as an individual right as well as an obligation of society. In her opening keynote Jacqueline Kool will explore the opportunities and pitfalls of the CRPD and its focus on participation from a disability studies perspective. How and under what conditions can it be helpful to us in moving towards participation?

Biography

Jacqueline Kool, MA in Theology. Before that she was trained as a social worker. She is one of the founders of Disability Studies in the Netherlands and currently serves as the organisation's knowledge manager. She has served as a writer, trainer and consultant in the disability advocacy and policy fields in the Netherlands for over 20 years, working f.i. for educational institutions, care institutions, government, patient-/disability organisations and religious communities. Kool's work centres on disabled people's belonging and participation, and representations of the disabled body. Her work reflects a commitment to integrate theoretical perspectives with the lived experience of disability. She wrote f.i. Goed Bedoeld. Levensbeschouwelijk kijken naar handicap en ziekte (With good intentions. Religious Perspectives on Disability and Disease), Zoetermeer: Boekencentrum 2002 and Eros in de kreukels. Verhalen van lijven, leven en lust (Eros (un)limited, stories on lives, limbs and lust), Renkum: MK Publishers 2010.

Prof. Björn Gerdle MD PhD

Thursday 9 November, 10.50 – 11.30

Olle Höök lecture: Multimodal/multidisciplinary pain rehabilitation – new ways forward!?

Chair: prof. Kristian Borg MD PhD

Summary

Chronic pain conditions are common; approx. 20% of the adult population lives with at least *moderate* chronic pain. Chronic pain patients describe wide consequences such as intense and disturbing pain, psychological distress and insomnia, reduced work ability and sick-leave, ill-health, and low quality of life. Acute and chronic pain are influenced by and interact with physical, psychological, social, and contextual factors, a bio-psycho-social framework is considered in clinical practice. Multimodal (i.e., multidisciplinary) rehabilitation programs (MMRPs) are complex interventions based on such a framework and usually continue over several weeks with both general and patient specific goals. MMRPs represent evidence-based progress in treatment for patients with chronic pain. Although there is some evidence that MMRPs are effective, the effect sizes are generally small to moderate. During the lecture will be discussed how to improve the results of MMRPs. Both emerging neurobiological aspects of nociception/pain as well as selection to and content of MMRPs may be important to consider for improving the results.

Biography

Björn Gerdle MD PhD is professor and a senior consultant in rehabilitation medicine since 1992 at Pain and Rehabilitation Centre, University Hospital, and Linköping University, Linköping, Sweden. He is mainly active within the field of chronic pain. His current major research areas are biomarkers of nociception and pain and multimodal/multidisciplinary rehabilitation. Since 2012 he is research leader for the research group associated with the Swedish Quality Registry for Pain Rehabilitation. During 2005-2013 he was Associate Editor for J Rehabilitation Medicine.

Wilma van der Slot MD PhD

Friday 10 November, 11.50 – 12.30

Growing older with cerebral palsy: lifelong challenges for patients and providers

Chair: prof. Henk Stam MD PhD

Summary

With increasing age, persons with cerebral palsy (CP) begin to develop co-morbidities that are often progressive. Frequently reported symptom clusters include pain, fatigue, depressive feelings and deterioration in walking ability. These experiences contribute to functional problems. Because there is no cure for CP, navigating life with this complex disability requires knowledge of the disorder, self-management skills and coping strategies for persons with CP and their caregivers. To optimise health and functioning, health care services must address challenges at various life stages. This presentation will cover ageing, frequently occurring problems and treatment approaches to providing care to adults with CP. Specific attention will be given to treatment of symptom clusters. The discussion will be framed in the context of providing efficient health care throughout the adult lifespan. Because of overlapping symptom clusters and participation limitations experienced with increasing age, the treatment approaches discussed are applicable to persons with CP as well as those with other long-term neuro-disabilities.

Biography

Wilma van der Slot MD PhD, is a rehabilitation specialist at Rijndam Rehabilitation in Rotterdam, the Netherlands. She works as a senior researcher at the Department of Rehabilitation Medicine, Erasmus University Medical Centre, within the themes 'Transition and Lifespan research' and 'MoveFit'. Her major interests are the consequences of chronic neuro-disabilities such as cerebral palsy (CP) on the health and life of patients, and provision of care throughout the lifespan. Among other things, she researches health issues in CP and works on symptom cluster treatment (e.g., long-term effects management programme), for persons with chronic childhood- or neuro-disabilities. Her goal is to disseminate these findings to patients, patient support organisations and clinicians in an easily accessible format to improve the health, self-management and quality of life for persons with long-term neuro-disabilities.

Prof. Yves Vandermeeren MD PhD

Friday 10 November, 16.20 – 17.00

Implementing motor learning and tDCS in stroke neurorehabilitation

Chair: prof. Guy Vanderstraeten MD PhD

Summary

Despite the advance of efficient management of acute stroke and the revolution driven by the rise of thrombectomy, a majority of stroke victims are and will be left with various impairments which dramatically impact upon their quality of life and independence. More than ever, neurorehabilitation will become a cornerstone in the development of acute and chronic stroke care. Therefore, a real science of neurorehabilitation is currently emerging; this is why so many new methods and technologies are under investigation. Two key developments will be discussed within the framework of stroke neurorehabilitation: motor learning and transcranial direct current stimulation (tDCS). Motor learning is one of the main factors driving motor recovery after stroke. Understanding the neurophysiological foundations of motor learning, whether it is impaired after stroke and whether it is possible to enhance it by adequate interventions are among the crucial questions to be answered in the next years. tDCS is a safe and non-invasive neuromodulation method used to directly modulate brain excitability and activity through weak and painless transcranial electrical stimulation. Many studies have demonstrated that tDCS can modulate virtually any brain function in healthy individuals. Several pioneer studies have also shown that tDCS can enhance impaired functions in stroke patients and can be safely combined with motor learning/ training/ neurorehabilitation, with the potential to enhance long-term benefits of such interventions.

Biography

Yves Vandermeeren is a Neurologist involved in the care of acute and chronic stroke patients; and in the study of neuroplasticity after stroke. He obtained is MD degree (1998) and his PhD in Neuroscience (2003) from the Université catholique de Louvain (UCL, Belgium). After completing the Neurology residency program, he pursued his research on post-stroke plasticity as a Post-Doc Fellow at the National Institute of Health (NIH, 2005-2007). In 2007, he joined in the CHU UCL Namur (Belgium), where he works as a stroke neurologist (Stroke Unit) and a neuroscientist. YV has been appointed Associate Professor in 2009 (UCL), and Professor in 2015. He is an active member of the Institute of NeuroScience (IoNS, UCL) and the Louvain Bionics consortium. He is one of the founding members of the Belgian Society for NeuroRehabilitation (bSNR). He is also a member of the Scientific Board of the Belgian Stroke Council (BSC) since 2008 where he served as President (2009-2013). His main research topics are the study of the motor system's plasticity with fMRI, developing new ways to enhance post-stroke motor recovery based on motor learning principles, the use of neuromodulation such as non-invasive brain stimulations, and robotics.

Parallel Session 1 – Free Paper Sessions

Thursday, 13.00 – 14.00

During the free paper sessions the Dutch nominee for the TESC-Award will be chosen.

Free paper session 1A

Chair: Gunilla Brodda Jansen

1. Body weight-supported bedside treadmill training facilitates ambulation in Intensive Care Unit patients: An observational proof of concept study

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Introduction: Early mobilisation is advocated to improve recovery of intensive care unit (ICU) patients. However, severe weakness in combination with tubes, lines and machinery are practical barriers for implementation of ambulation with critically ill patients. **Objective:** The aim of this study was to explore the feasibility of Body Weight-Supported Treadmill Training (BWSTT) and to evaluate whether this intervention could facilitate the time to first ambulation in critically ill patients in the ICU. **Methods:** A custom build bedside Body Weight-Supported Treadmill was used and evaluated in physiologically stable medical and surgical patients in the ICU. Feasibility was evaluated according to eligibility, successful number of BWSTT, number of staff needed, adverse events, number of patients that could not have walked without BWSTT, patient satisfaction and anxiety. **Results:** Twenty participants, of whom 15 with ICU-acquired weakness, underwent 54 sessions BWSTT. Two staff members executed the BWSTT and no adverse events occurred. Medical equipment (ventilator, monitor, infusion, etc.) did not have to be disconnected during all treatment sessions. In 74% of the session, the participants would not have been able to walk without the BWSTT due to severe muscle weakness. In 25% of the interventions, walking distance was increased by more than 100% compared to walking without BWSTT. Patient satisfaction with BWSTT was high and anxiety low. **Conclusions and clinical message:** This proof of concept study demonstrated that BWSTT is safe, reduces staff resource, and facilitates the first time to ambulation in critically ill (mechanically ventilated) patients with severe muscle weakness in the ICU.

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2. Does cardiac rehabilitation extended with a behavioral group intervention lead to changes in physical activity and sedentary behavior? The OPTICARE randomized controlled trial

N. ter Hoeve[1], M. Sunamura[2], H.J. Stam[1], M.L. Geleijnse[1], E. Boersma[1], R.T. van Domburg[1], H.J.G. van den Berg-Emons[1]

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Introduction: Current cardiac rehabilitation (CR) is insufficient to achieve an active lifestyle. Our objective was to evaluate the effectiveness of CR extended with behavioral group sessions on physical activity and sedentary behavior. **Methods:** 491 persons with acute coronary syndromes were randomized into: 1) 3-months (M) standard CR; or 2) CR+counseling: standard CR with 3 additional pedometer-based active lifestyle group counseling sessions and a 9M follow-up program comprising 3 sessions with healthy lifestyle counseling. Measurements were performed at baseline (T0), post-CR (T1), 9M post-CR (end of follow-up program, T2), and 15M post-CR (T3). Physical behavior was measured with accelerometry and expressed as steps/day, daily minutes of moderate-to-vigerous physical activity (MVPA) and daily hours in sedentary behavior (SB). Longitudinal changes were analyzed with GEE models. **Results:** At T1, the CR+counseling group gained daily 1493 steps, whereas the standard CR group gained only 798 steps/day (p=.019). During the follow-up program, these improvements partly diminished (+1204 vs +450 steps at T3, p=0.15). Although there was a trend for higher improvements in MVPA for CR+counseling at T1 (+14 min vs +7 min in standard CR), this was not significant (p=0.240). There were no differences in SB. **Conclusions:** CR extended with a behavioral intervention was successful in improving

daily step count, while improvements in total physical activity were minimal. These results suggest that objective feedback, in our study provided by pedometers, is essential for physical behavior changes. Although the program needs optimization, we recommend to implement physical behavior counseling sessions as part of CR.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_349195_NDsaKiw7FI.png
Caption 1: Intervention effects

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3. Compensation strategies for gait impairments in Parkinson's disease

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Introduction and objective: Patients with Parkinson's disease (PD) use a wide variety of strategies to compensate for gait deficits, and in particular to compensate for freezing of gait. An overview and classification of available strategies is currently lacking, but this may contribute to understanding their underlying mechanisms and to develop focused rehabilitation techniques. Here, we aimed to provide such an overview. **Methods:** We collected video recordings of patients with PD who spontaneously informed us about the use of self-invented tricks and aids to improve their mobility. Specifically, we asked them to bring home-videos showing strategies they were using to walk indoors or outdoors. Subsequently, six experts in the domain of freezing of gait studied the collected videos and devised them into categories of compensation strategies. **Results:** Over a period of 4 years we collected 58 unique compensation strategies. We devised them into the following categories: 1) using internal cues, 2) using external cues, 3) changing the balance requests, 4) altering the mental state, 5) using motor imagery or action observation, 6) adapting a new walking pattern, 7) alternative forms of using the legs to move forward. **Discussion:** Overarching working mechanisms of compensation strategies involve an allocation of attention to gait, the introduction of goal-directedness and the use of motor programs that are less overlearned than those used in normal walking. **Clinical message:** From a rehabilitation perspective, it is important to educate patients about the wide range of possible compensatory strategies, and to investigate which is most feasible for each individual.

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4. S100β protein as a predictor of post-stroke functional outcome: a prospective study

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Background: Stroke is one of the leading causes of disability worldwide. Early prediction of post-stroke disability using clinical models is of great interest, especially in the rehabilitation field. Although some biomarkers and neuroimaging techniques have shown potential predictive value, there are still insufficient data to support their clinical utility in predicting post-stroke functional recovery. **Aim**: To assess the value of serum biomarkers (CRP, D-Dimer, fibrinogen, and S100β protein), in predicting medium to long-term (12 weeks) functional outcome, in patients with acute ischemic stroke. **Methods**: This is an observational, prospective study in a sample of patients hospitalised for ischemic stroke (n=131). Peripheral blood levels of biomarkers of interest were determined at admission (C-reactive protein, D-dimer, and fibrinogen) or at 48 hours post-stroke (S100β protein). Functional status was accessed at 48 hours and 12 weeks post-

stroke, using the modified Rankin Scale (mRS). **Results**: S100β protein levels measured at 48 hours were significantly associated with mRS at 12 weeks (OR=1.005, 95%CI [1.005–1.007]; P<0.001). This association that was not seen for the remaining biomarkers of interest. The S100β cut-off for poor functionality at 12 weeks was ≥140.5 ng/L (sensibility 83.8%; specificity 71.4%; AUC=0.80, 95%CI [0.722, 0.879]). **Conclusions**: S100β levels in peripheral blood at 48 hours post-stroke reflect acute stroke severity and predict functional outcome at 12 weeks with a cut-off value of 140.5 ng/dL. The value of S100β as predictor of functional recovery after-stroke should be emphasised in further clinical research and clinical practice.**Keywords**: Stroke; Biomarkers; S100β; Rehabilitation; Functionality

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Free paper session 1B

Chair: Gaetan Stoquart

5. Transcranial direct current stimulation to treat sub-acute post-stroke aphasia: a randomized controlled trial

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Introduction: Transcranial direct current stimulation (tDCS) is assumed to have an additional effect on aphasia therapy in chronic post-stroke aphasia. However, studies investigating its effectiveness in the sub-acute stage are limited. **Objective:** To investigate the effect of tDCS in sub-acute post-stroke aphasia. **Patients:** 58 patients with sub-acute aphasia (<3 months post stroke), who were enrolled in an inpatient/outpatient rehabilitation programme. **Methods:** The protocol of this multicentre double-blind randomized controlled trial was published in Trials (2016). Patients participated in 2 intervention weeks, with a pause of 2 weeks in between. In each intervention week, participants received daily 45-minute word-finding therapy, combined with either anodal tDCS over the left inferior frontal gyrus (1 mA, 20 minutes; experimental group) or sham-tDCS over the same region (control group). Measurements were performed at baseline, immediately after both intervention weeks, and at 6 months follow-up. The primary outcome measure was the Boston Naming Test, a word-finding test for aphasia. Power analysis showed that a sample size of 58 patients was needed. Data will be analysed with linear mixed models. **Results:** At present, the inclusion is complete; N=58, 40 men, mean age 58.9 years (SD:9.9), time post-stroke 6.7 weeks (SD:2.6). In April 2017 follow-up data will be complete, which allows for unblinding of the data. In May 2017, statistical analyses will be performed and results will be available. **Discussion, conclusions and clinical message:** Our results will contribute to the discussion on whether tDCS is effective in regular aphasia rehabilitation programs for the sub-acute post-stroke population.

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6. Caregiver mediated exercises with e-health support for early supported discharge after stroke: results of the CARE4STROKE trial

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Introduction: Additional exercise therapy has a positive effect on functional outcome after stroke. There is an urgent need for resource-efficient methods to augment rehabilitation services without increasing health care costs. **Objective:** To evaluate (cost)-effectiveness of a caregiver-mediated exercises (CME) program combined with e-health services after stroke (CARE4STROKE) in terms of self-reported mobility and length of stay. **Patients and Methods:** An observer-blinded randomized controlled trial, in which 66 stroke-patients admitted to a rehabilitation center or nursing home were randomly assigned to either 8 weeks of the CARE4STROKE program in addition to usual care or 8 weeks of usual care alone. A tablet computer was used to present video-based exercises in which a caregiver acted as an exercise coach, in consultation with a trained physiotherapist. **Results:** We will present the results concerning 1) the primary outcome measures length of stay and self-reported mobility, 2) the secondary outcomes aimed at functional outcome of the patient and psychosocial functioning of patient and caregiver, including empowerment, health-related quality of life and strain of the caregiver, 3) an economic evaluation. **Discussion and conclusion:** This is the first proof-of-concept trial in

which the cost-effectiveness of CME combined with e-health services was investigated. We hypothesize this program leads to better functional outcome and early supported discharge, resulting in reduced costs. However, definitive effectiveness needs to be studied in a future phase IV trial. **Clinical message:** CME is an innovative intervention to augment rehabilitation services and facilitating early supported discharge from a rehabilitation centre or nursing home post stroke.

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7. Fatigue, physical fitness and physical behaviour in patients with aneurysmal subarachnoid haemorrhage: a prospective one-year follow-up

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Introduction: Aneurysmal subarachnoid haemorrhage (a-SAH) is caused by a bleeding of a ruptured aneurysm into the subarachnoid space. Fatigue is reported in two-thirds of the patients and is found to restrict participation in daily life. **Objectives:** To investigate fatigue, physical fitness and physical behaviour after a-SAH (I), to explore whether mechanisms of physical deconditioning underlie fatiue (II), and to explored whether fatigue can be predicted by diasease characteristics. **Methods:** Fatigue, physical fitness and physical behaviour were evluated at six and twelve months post onset, and compared to sex- and age-matched controls. Fatigue was evaluated by the Fatigue-Severity-Scale. Cardiorespiratory fitness ($\dot{V}O_{2peak}$) and isokinetic knee muscle strenght (Nm) were evaluated by cardiopulmonary exercise testing and isokinetic dynamometry (60°/s). Physical behaviour, including physical activity (PA) and sedentary behaviour (SB), was evaluated by accelerometery (VitaMove). **Results:** Fifty-two patients participated. Half of them had fatigue complaints over te first year. The cardiorespiratory fitness and knee muscle strength were lower in patients than in controls at six and twelve months ($p<0.05$). Patients were less physically active over the first year ($p<0.05$). Mixed model analyses revealed that patients with higher physical fitness were less severe fatigued ($p<0.05$), and patients who were more physiscally acitve had higher physical fitness ($p<0.05$). **Discussion:** The physical fitness is impaired after a-SAH and related to more severe fatigue. Furhter, patients who were less physically active had lower levels of physical fitness. **Clinical message:** Exercise training may contribute to a multimodal treatment for fatigue after a-SAH.

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8. Predicting level of functioning one year after moderate to severe traumatic brain injury: a systematic review

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Prognostic studies on outcome after moderate to severe traumatic brain injury (TBI) usually focus on survival 6 months post TBI. In clinical decision making a more detailed prediction of the expected level of functioning is of paramount importance. The aim of this study was to identify prognostic factors for level of functioning one year post TBI. **Objective**: To systematically review the literature for studies that investigated prognostic factors for the level of functioning as measured with the Barthel index, Functional Independence Measure or Glasgow Outcome Scale Extended one year after moderate to severe traumatic brain injury. **Search strategy and selection**: Pubmed, Embase, Psychinfo and Web of

Science were searched up to march 2016. Cohort studies were selected if they assessed predictors for BI, FIM or GOSE in adults at least one year after TBI. Inclusion criteria were: persons with moderate or severe TBI based on criteria of the Dutch neurologist association. Two reviewers independently included and reviewed articles. Levels of evidence were assigned based on quality and number of studies. **Results:** 50 articles involving a total of 22557 patients were included. Significant predictors for a higher level of functioning after TBI were: normal pupil reaction , lower intracranial pressure, lower Traumatic Coma Data Bank classification, absence of diffuse axonal injury on FLAIR scan. Not predictive for level of functioning were: gender, substance abuse and TAI lesions in T2 GRE scan. **Conclusion**: Available research varies greatly in outcome definition, methodology, and predictors of interest, which causes differences in results.

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Free paper session 1C

Chair: Nicole Voet

9. Development of gross and fine motor performance in individuals with cerebral palsy

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Introduction: In children with cerebral palsy (CP), limits of gross motor capacity decrease with increasing GMFCS level. For GMFCS I-III, gross motor capacity increases to 90% of the limit at 4 years of age. The limit and rate of motor *performance* development are unknown. **Objective:** To describe the development of gross and fine motor *performance* of individuals with CP. **Patients:** Individuals with CP aged 1-27 years were included (n=314, with 1054 observations, GMFCS I-V). **Methods:** Participants were assessed up to four times at 1-year intervals (age 1-16yrs) and at a 13-year follow-up (age 21-27yrs). Motor performance was measured using the gross (range: 0-40) and fine (range: 0-32) motor skills subdomains of the Vineland Adaptive Behavior Scales (VABS). Non-linear mixed effects analysis was conducted to estimate the limit (maximum) and Age-90 (age when 90% of the limit was reached) that create the average development curves for gross and fine motor performance by GMFCS level or MACS level. **Results:** Development curves showed that limits of gross and fine motor performance decreased significantly with each GMFCS or MACS level. Age-90's decreased from 6y8m for GMFCS I to 1y3m for GMFCS V and 7y0m for MACS I to 1y5m for MACS V. **Discussion and Conclusions:** Similar to motor capacity growth curves, severity of CP influenced gross and fine motor performance curves. Children with GMFCS I-III reached their maximum gross motor performance two years later than gross motor capacity. **Clinical message :** Treatment should incorporate a slower rate of development of gross motor performance than capacity.

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10. Physical activity, fatigue and sleepdisorders after mild brain injury and orthopedic injury in adolescents and young adults

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Introduction: Physical inactivity, fatigue and sleep disorders are common among adults after traumatic brain injury (TBI) but insight into their occurrence among youth with TBI is limited. **Objective**: To compare physical activity, fatigue and sleep disorders in youth after (m;mild) TBI with similar patients after orthopaedic injury (OI). **Patients** : Youth aged 12-25 years with mTBI or OI 6-18 months post-injury from two hospitals. **Methods**: Cross-sectional study, using an electronic survey including the Activity Questionnaire for Adults and Adolescents (AQuAA; minutes/week moderate-vigourous

activity), Checklist Individual Strength (CIS, 4 fatigue subscales), and Pittsburgh Sleep Quality Index (PSQI, total score). Associations between type of trauma (TBI or OI) (dependent) and meeting health enhancing physical activity recommendations (D-HEPA;yes/no), fatigue (CIS), sleep (PSQI) (independent) were examined by multivariable logistic regression analyses, adjusting for potential confounders. **Results**: Forty-nine patients with mTBI (mean 16.2 years (SD3.6), 45% male) and 54 with OI (mean 13.8 years (SD3.1), 54% male) were included. The mTBI patients were significantly less active and less frequently met D-HEPA recommendations than OI patients (OR 4.67 (95%CI 1.53-14.22), p=0.01). The CIS subscale-Concentration was significantly higher in the mTBI-group, whereas other subscales and PSQI were not different from the OI-group. **Discussion & Conclusion**: Youth with mTBI were less physically active and more fatigued (concentration) than their peers with OI, with no differences regarding sleep quality. **Clincal Message**: Physical inactivity and fatigue were more common after mTBI than OI in youth. Whether physical activity or fatigue is the best target for treatment remains to be established.

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11. Difficulty and independence in participation of emerging adults with cerebral palsy: a prospective cohort study from their adolescence into their early thirties

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Introduction: Knowledge on the course of participation difficulties of emerging adults with cerebral palsy (CP) could provide insight in an important stage of participation development. **Objective:** To describe the course of difficulty and independence in participation from adolescence into the early thirties of individuals with CP. **Patients:** Individuals with CP without intellectual impairment aged 16-20 years were included (n=151, 63% male, GMFCS I-IV). **Method:** Participants were assessed with the Life-H questionnaire three times biyearly (age 16-24) and at a 13 year follow-up (age 21-34). Scores (range: 0-10) reflect difficulty and independence in the categories housing, interpersonal relationships, education and employment, recreation, community life and responsibilities. Multilevel modelling was used to determine the course of participation by GMFCS level. **Results:** Difficulty in housing and interpersonal relationships increased regardless of GMFCS over age-range 16-34. In recreation and community life, a different course was observed for GMFCS III and IV compared to level I and II, reflecting a decrease in difficulty through ages 16-23. Additional analyses showed that difficulty increased over age 23 in education and employment, recreation and community life. Mean category scores reflected independent functioning (score 5.56) in all GMFCS levels over age 23. **Discussion and Conclusions:** In emerging adults with CP, difficulty in housing and interpersonal relationships increased and difficulty in recreation and community life decreased for GMFCS III and IV. Furthermore, over age 23 difficulty in participation increased in all categories except responsibilities. **Clinical message:** To prevent deterioration in adulthood, interventions should optimize participation for emerging adults with CP.

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12. Exploring determinants of effectiveness of intensive functional physiotherapy in ambulatory children with spastic cerebral palsy

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Introduction-and-objectives: Treatment of ambulatory children with spastic cerebral palsy (CP) is multidisciplinary, usually consisting of goal-directed intensive periods of physiotherapy (iPT) plus/minus botulinumtoxin, casting or ankle-foot-orthoses. Such combined trajectories are effective at the group level, but individual effectiveness varies enormously. We explored to what degree patient and treatment characteristics explained changes on several outcomes. **Patients-and-methods:** We used trial data of 64 children with CP (aged 4-12 years, GMFCS levels I-III) with spasticity-related problems in mobility/activity domains. All children had a 12-week iPT period as part of individual multidisciplinary treatment trajectories. iPT periods were based on a best-available-evidence guideline(2010); ideally three 45-60 minute sessions per week and a rest day between sessions. The actually executed iPT periods were dichotomized into optimally evidence-based executed or not (based on frequency, duration and rest day criteria). Effect outcomes were gross motor function (GMFM), goal attainment (GAS), functional strength and proxy-reported CP-impact. **Results:** For 59% the iPT was not optimally evidence-based executed. Multiple regression models (adjusting for other characteristics) showed that optimal execution of iPT strongly explained improvements in GMFM ($p=0.039, \beta=1,3$) and GAS ($p=0.088, \beta=0.6$), but not for CP-impact ($p=0.901, \beta=-0,4$) or strength ($p=0.347, \beta=0,7$). Simple regression for strength improvement however showed that a rest day positively contributed ($p=0.055$), whereas an interruption ≥1 week had negative impact ($p=0.001$). **Discussion-and-Conclusion:** We identified that optimal content and design of iPT periods is crucial for treatment success in this CP subgroup. **Clinical-message:** It is important to put effort into executing physiotherapy according to best-available evidence in ambulatory spastic CP.

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Free Paper Session 1D

Chair: Kristian Borg

13. Feasibility of functional outcome measures for adults with mitochondrial disease

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Introduction: To determine if a selection of functional outcome measures in adult patients with mitochondrial diseases (MD) is feasible in daily clinical practice. **Methods:** We systematically selected a list of robust functional outcome measures ('toolbox') that are relevant for MD patients namely the Åstrand submaximal cycle exercise test (Åstrand), 6-minutes-walking-test (6MWT), 30 seconds sit to stand test (30CST), Berg Balance Scale (BBS), Performance-Oriented Mobility Assessment Balance and Gait (POMA-B, POMA-G), hand grip strength (HGS), pinch strength (PS), muscle strength using a hand-held dynamometer (HHD), Motor Function Measure (MFM) and Modified Tardieu Scale (MTS). As part of a four-day multidisciplinary clinical admission to investigate different multi-organ problems ('Mitostreet'), patients with diagnosed MD were examined to explore the feasibility of the toolbox. **Results:** Fifty-five genetically proven MD patients (mean age 44±12, range 18-66, 42% men) were studied. The POMA-B, POMA-G, HGS, PS, HHD, MTS and MFM were feasible to perform in MD patients (96-100%). The 30SCT and BBS could be performed in 58% and 69%, respectively. Nineteen patients (34%) could complete the Åstrand. Failure to complete the Åstrand was due to muscle weakness, fatigue or exercise intolerance. Twenty-seven out of 36 patients (75%) who couldn't complete the Åstrand where able to perform the 6MWT. **Discussion and conclusion:** This is the first safe and feasible toolbox with functional outcome measures in patients with proven MD. More experience using these outcome measures must be obtained before reliable conclusions regarding the validity of these instruments can be drawn.

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14. Skills for Growing up: systematic attention for participation and self-management in children and youth with spina bifida

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Introduction: Youngsters with Spina bifida (SB) are challenged in achieving autonomy and self-management. The Skills for Growing Up tool (SGU ("Groeiwijzer")) encourages optimal development towards autonomy and participation. **Objectives:** We developed a digital version of SGU in KLIK (a safe web-based application), for use in the SB out-patient clinic. This study aimed to evaluate feasibility and appreciation of SGU. **Patients and methods:** We included SB patients >7 years who visited VUmc's SB clinic (March 2015-May 2016), their parents and professionals of the SB clinic. Feasibility and appreciation (score 1-10) were studied through questionnaires. This study was approved by VUmc's METC. **Results:** Twenty-nine of /57 eligible SB patients and their parents used SGU (51%). Most (n=22,76%) set independency goals using the "SGU action plan". Ten parents, 9 children and 4 professionals completed the evaluation form. The mean SGU appreciation score was 7, 6, and 8 respectively (range 4-9).The tool helped professionals to discuss topics about independency and sexuality. Children and their parents felt encouraged to discuss transition topics together. According to participants the SGU was easy to use, although some suggested improvements. **Discussion and conclusions:** Appreciation of the SGU in SB clinic is reasonable to good. The feasibility could possibly be increased by developing an

interactive SGU app featuring reminders and feedback. Half of the patients used the SGU; investigation of non-users could give more insight into obstacles. **Clinical message:** Systematic attention for self-management supplements regular rehabilitation care. Implementation could be improved with apps on modern devices that appeal to youngsters.

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15. Healthcare use and information needs of children with neonatal brachial plexus palsy: a cross-sectional survey among 465 patients

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Introduction: Children with neonatal brachial plexus palsy (NBPP) may have need for healthcare and/or information throughout their lives due to sequelae of their condition.**Objective:** To investigate healthcare use and information needs of children due to NBPP. **Patients/Methods:** For this cross-sectional study, all patients with NBPP (aged 0-18 years) and/or their parents, seen in our NBPP clinic, were invited to complete a survey. The survey comprised questions on healthcare use in the past year (contact with the expert team and/or 11 other types of healthcare professionals) and on information needs (12 NBPP-related topics). Outcomes were described for 3 age-groups (0-1, 2-9 and 10-18 years), and based on follow-up status (early/late/no discharge). **Results:** 465 parents/patients participated (59/226/180 patients in the 0-1/2-9/10-18 age-groups, respectively). 293 (63%) had C5-C6 lesions, 193 (42%) had been discharged from follow-up, 83 of whom were categorized as 'early' (defined as <1 year of age) due to spontaneous lesion recovery (19/59, 50/226, 14/180). Over the past year, 198 patients had had contact with the expert team (49/59, 81/226, 68/180) and 288 with at least 1 other healthcare professional (53/59, 133/226, 102/180). Of the 83 patients discharged early, 34 reported healthcare use. 228 participants (49%), of whom 23 were patients discharged early, reported information needs regarding at least one topic. **Discussion/Conclusions:** Healthcare use and information needs of children due to NBPP are considerable even in children who were early or late discharged. **Clinical message:** Stricter longitudinal follow-up and information provision for all patients with NBPP throughout life is needed.

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16. Sports choice and participation in Neonatal Brachial Plexus Palsy: A cross-sectional study

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Introduction: Neonatal brachial plexus palsy (NBPP) may result in life-long impaired upper arm function. Literature regarding sports participation among children with NBPP is scarce. **Objective:** To quantify sports participation in NBPP children. **Method:** All children with NBPP, aged 8-19 years, seen at the multidisciplinary NBPP expert center of LUMC

Leiden, The Netherlands were asked to fill out the Short Questionnaire to Assess Health and Activity for Adolescents. Participation in various types of sports was quantified. To investigate the impact of the severity of nerve lesions, surgical and conservative treated subgroups were compared using t-tests or Chi-squared tests. **Results:** 190 children participated (median age 12y, inter quartile range 10-14y). 71.4% underwent neurosurgery and/or secondary surgery. 147 (77%) participated in sports, with no differences between treatment groups. 96 children provided information on the type of sports: 40 (42%) were active in sports involving mainly the legs (e.g. soccer), 34 (35%) in sports which require also active use of one arm (e.g. badminton) and 22 (23%) in sports necessitating active use of 2 arms (e.g. swimming). In the surgical treatment group, significantly less children played sports involving 2 arms (16% vs 38%, p=0.007). No differences were found between subgroups for sports duration (p=0.30) and active minutes/day (p=0.51). **Discussion and Conclusion:** Most NBPP children succeeded in sports participation. Sport selection was associated with lesion extent and severity. **Clinical message:** The current study provides new insights into sports participation of NBPP children, therefore improving knowledge about functional prognosis. This is necessary to optimize patient education.

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Free Paper Session 1E

Chair: Janneke Stolwijk

17. Virtual reality training to improve gait stability in patients with chronic incomplete spinal cord injury: useful or useless?

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Many subjects with chronic incomplete spinal cord injury (iSCI) have disturbed gait and balance, which impacts daily functioning. Furthermore, walking speed is low. With conventional therapy, subjects are limited in training their gait stability, because of fear of falling. With virtual reality training on the GRAIL (Gait-Realtime-Analysis-Interactive-Lab), patients can perform many repetitions of challenging tasks in a safe environment. The objective was to examine the effect of 6-weeks GRAIL-training on walking speed and gait stability in iSCI patients. So far, ten patients with a chronic (>6 months) iSCI participated. Patients performed a two-minute-walk-test on the GRAIL, during the first, second and last (12th) training. Primary outcome was walking speed. Step length, step width and stability measures during gait (Dynamic Stability Margin (DSM) [Van Meulen, 2016]) were secondary outcomes. The effect of GRAIL-training on outcome parameters was tested by Friedman and Wilcoxon post-hoc tests. Friedman-test revealed significant differences in walking speed ($X^2(2,18)=14.6$, $p=0.001$). Walking speed was larger during the last training (0.92m/s) compared to the first training sessions (0.68m/s and 0.71m/s). Significant differences were found for step length ($X^2(2,18)=14.8$, $p<0.001$), step width ($X^2(2,18)=9.6$, $p=0.008$) and DSM ($X^2(2,18)=8.6$, $p=0.014$). Post-hoc showed significant improvements in step length and DSM at the last training compared to the first two training sessions. Median step width was significantly smaller in the last compared to the first training. GRAIL-training improved walking speed and gait stability in patients with iSCI. Future research should focus on the effect compared to conventional treatment and the endurance of this effect.

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18. Energy expenditure during lying, sitting, standing and walking in patients with spinal cord injury

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Introduction: Sedentary behaviour is a risk factor for an array of medical concerns. It is commonly defined as "any waking behavior characterized by an energy expenditure ≤1.5 metabolic equivalent of task (MET) while in a sitting or reclining posture". It is unknown whether this definition applies to patients with a spinal cord injury (SCI) because behaviours generally considered sedentary in the general population maybe more straining for them. *Objective* The objective of this study was to determine energy expenditure among patients with SCI across activities generally considered sedentary and non-sedentary. **Patients/Methods:** Energy expenditure of 19 patients with SCI (mean age 47.8 ± 11.3 years, Hofferscale 1(n=5), 2(n=5), 3(n=7), 4(n=2)) was measured using indirect calorimetry and expressed in METs during lying, supported and unsupported sitting, standing and walking. Calculations were done for the total group as well as categorised by the Hoffer Scale. **Results:** For the total group mean METs were 0.98 ±.18 for sitting supported, 1.03 ±.18 for sitting unsupported, 1.24 ±.28 for standing and 3.71 ±1.02 for walking. Supported sitting, unsupported sitting

and standing showed MET values below 1.5, and walking showed MET values above 1.5 across all levels of ambulation. **Discussion/Conclusions:** This study demonstrates that the energy expenditure during typical sedentary behaviours (sitting supported and unsupported) is very narrowly bounded around 1.0 METs. Energy expenditure during sitting and standing was ≤1.5 METs for all Hoffer levels. *Clinical message* Sitting (supported and unsupported) and standing seems not to be sufficient to interrupt sedentary behaviour in patients with SCI.

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19. A framework for measuring progress in exoskeleton-skills in people with complete spinal cord injury

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Before exoskeleton community use in people with spinal cord injury (SCI) is possible an intensive training in which users learn to perform basic and advanced skills independent and safe is necessary. So far, a framework to test exoskeleton-skills and the consistency of performing exoskeleton-skills is lacking. The aim of this study was to develop a framework for measuring the progress in the ability to perform basic and advanced skills. Twelve participants with motor complete SCI (Th1-L1) (twenty-five will be included) were given twenty-four training sessions in eight weeks with the Rewalk-exoskeleton. During the 6th, 12th and 18th training the Intermediate-skills-test was performed consisting of twenty-eight skills, measured in an ascending order of difficulty until two skills were not achieved (two out of three failed attempts). When participants could walk independently, the Final-skills-test, consisting of twenty skills, was performed twice in the last (24th) training session. As a reliability measure the consistency in the number of exoskeleton-skills which were performed the same (successful-successful or failure-failure) in the first two attempts relative to the total number was used. Ten participants completed the training program. Their median achieved Intermediate-skills were 5 (2-8), 6.5 (5-21) and 11.5 (5-27) in training six, twelve and eighteen, respectively. Seven participants performed the Final-skills-test, who achieved 16.5 (14-20) and 17 (14-19) skills. 179 out of 245 Intermediate-skills (73%) and 112 out of 140 Final-skills (80%) were performed the same. The progress in achieved exoskeleton-skills was measured with the proposed framework. The participants performed exoskeleton-skills with an acceptable consistency.

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20. SCI aftercare protocol as a result of co-creation

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Introduction: In The Netherlands high quality of care for spinal cord injury (SCI) patients is available. In publications SCI aftercare is mentioned but there was no national aftercare protocol. In the SCI specialised rehabilitation centres, current aftercare differs between centres and lacks transparency and uniformity. The Board of the Dutch Flemish Spinal Cord Society (DUFSCoS) launched, at the request of Dutch SCI Association (DON), the plan to obtain a DUFSCoS Aftercare Protocol. **Objective:** To develop and implement a uniform and transparent SCI aftercare program. Which in cooperation with SCI patient representatives and national health insurers improves and warrants care. **Patients:** SCI is a chronic condition. After primary rehabilitation SCI patients can experience secondary complications, changing needs and goals. Aftercare can address, prevent and/or treat these. **Methods:** Collect (inter)national information about aftercare. Form a

workgroup with SCI specialised rehabilitation physicians + a DON representative. Create the protocol together.: **Results:** The purpose is 'cure and care' and prevention of complications, supporting best participation in society and anticipating expected "deterioration" in long(er) life with SCI. With a national protocol, people can rely on basic SCI aftercare everywhere in The Netherlands. **Discussion and conclusions:** In the past, after primary rehabilitation persons call when needed. This promotes self-management, but it doesn't work preventive. A specialized SCI aftercare service helps people and will prevent complications and problems. **Clinical message:** - A need for specialized SCI aftercare service. - Describe a national SCI Aftercare Protocol. - Co-creation by professionals and patients leads to added value.

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Free Paper Session 1F

Chair: Gaetane Stassijns

21. Effects of vocational retraining on disability pensions and employment in work disabled patients: average treatment effects by using inverse probability of treatment weighting

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Introduction: Vocational retraining (VR) for people with disabilities aims at supporting them in obtaining competitive employment. **Objective**: The study analyzed the effects of VR on disability pensions and employment in work disabled and unemployed patients who completed a medical rehabilitation program. **Patients**: We included unemployed persons aged 18 to 59 years who had completed a rehabilitation program due to musculoskeletal or mental disorders in 2008 or 2009. Treated persons started a VR after their medical rehabilitation. **Methods**: Inverse probability of treatment weighting was used to balance treated and untreated samples. The primary outcome was the rate of disability pensions (time of follow-up: 2009-2012 and 2010-2013, respectively). Secondary outcomes were employment of at least 30 days during follow-up and days in employment (time of follow-up: 2011/2012 and 2012/2013, respectively). **Results**: Data of 1,238 persons were included. 466 patients started a VR. Weighting reduced imbalances in baseline characteristics. The risk of a disability pension was reduced from 16.7% to 11.3% (absolute risk reduction: 5.3%, p=0.031; number needed to treat: 19 persons). Employment of at least 30 days was increased from 33.9% to 48.1% (p=0.007). Days in employment increased from 188 to 236 days (p=0.118). **Discussion and conclusion**: Biased estimations of treatment effects due to unobserved heterogeneity of the treatment groups may be possible. Considering this limitation, our findings support the use of VR. **Clinical message**: VR should be supported and prepared during medical rehabilitation in unemployed patients who are unlikely to resume job activities corresponding to their former job.

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22. Effectiveness of Graded Return to Work after Multimodal Rehabilitation in Patients with Mental Disorders. A Propensity Score Analysis

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Introduction: Graded Return to Work (GRTW) is a strategy aimed at bringing people gradually back to coping with a full workload after an extended period of sick leave. **Objective:** To determine the effect of GRTW in addition to a multimodal rehabilitation return to work (RTW) in people with chronic mental disorders. **Patients:** Patients with chronic mental disorders in a clinical rehabilitation setting. **Methods:** Questionnaires at the start of a multimodal rehabilitation and 15 months later were provided. Balanced groups (GRTW, noGRTW) were formed by propensity score matching based on 27 covariates. The primary outcomes were the RTW status at follow-up and the number of days on sick leave during follow-up. **Results:** From 1,062 data sets (GRTW: 508, noGRTW: 554), 381 pairs were matched (age: 47.8 years; 78% female; 65% affective disorders, 28% neurotic or somatic disorders). At follow-up, 88% of the GRTW group had returned to work

compared to only 73% of the controls (RR = 1.22, 1.13 to 1.31). The mean sick leave duration during the follow-up period was 7.0 weeks in the GRTW group compared to 13.4 weeks in the control group (p < .001). Additional explorative analyses showed that these effects were only observed in patients with an unsure or negative subjective RTW prognosis. **Conclusions:** GRTW in addition to a multimodal rehabilitation is effective in enhancing successful work participation in people with chronic mental disorders. **Clinical message:** GRTW after multimodal rehabilitation is particularly suitable for patients with a negative subjective RTW prognosis.

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23. Implementing research into practice: the German model of work-related medical rehabilitation

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Introduction: German work-related medical rehabilitation (WMR) was developed to support work participation in patients with musculoskeletal disorders and poor work ability. Randomised controlled trials have shown that WMR increases return-to-work rates than compared to conventional medical rehabilitation. Therefore, a guideline was established which describes main components of WMR. The guideline was disseminated by the German Pension Insurance Agency. **Objective**: Implementation of the guideline was analysed by assessing the dose delivered in rehabilitation centres which were approved to provide WMR programmes. **Patients**: Participants of WMR programmes in 2014 were matched with similar patients who received a conventional medical rehabilitation in 2011 before the guideline was published. **Methods**: Patient characteristics and dose delivered were extracted from administrative records. **Results**: Data of 9,046 patients from 59 rehabilitation centres were included. In 2014, the dose of work-related therapies was 4-times increased (2011: 2.2 h; 2014: 8.9 h). The dose of social counselling increased from 51 min to 84 min, the dose of psychological work-related groups from 39 min to 216 min, and the dose of functional capacity training from 39 min to 233 min. However, there was clear heterogeneity in meeting the guideline's recommendations between centres, especially the recommendation for providing functional capacity training. **Discussion and conclusions**: Top down dissemination of the guideline affected rehabilitation practice. The dose of major components of WMR has clearly increased since 2011. **Clinical message**: There is still a discrepancy between schedules followed in randomised controlled trials and usual care. This may reduce effect sizes.

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24. Diagnostic Accuracy of a Screening Instrument predicting future RTW Chance of Patients with Chronic Diseases. Overview of the existing Evidence

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Introduction: The effectiveness of rehabilitation depends on the individual non return to work (RTW) risk. Therefore, a risk score (SIMBO) was developed to predict the future RTW chance supporting the referral management. **Objective:** To test the diagnostic accuracy of the SIMBO (0 to 100 points) and to provide evidence for the main diseases. **Patients:**

Patients in the rehabilitation setting (18 to 65 years). **Methods:** Data were obtained from questionnaires at admission and 3 months after rehabilitation. The occurrence of critical RTW events in the follow-up was the primary outcome. All analyses were weighted for age, gender and ICD-10 diagnosis group with regard to the German rehabilitation population in 2015. **Results:** Data from 2,422 patients out of nine different disease groups were included. In these groups between 9% and 47% reported critical RTW events in the follow-up (total: 35.2%). The area under curve (AUC) criteria laid between .844 and .899 (total: .891). The standardised mean differences in the SIMBO score between patients with and without a critical RTW event was 1.22 to 1.48 (total: 1.43). Sensitivity and specificity rates varied depending on the chosen threshold. Using optimal thresholds they ranged from 74% to 93% as well as 72% to 87%. The identification of critical RTW events could be increased threefold due to the SIMBO. **Conclusions:**The SIMBO screening predicts the non RTW risk after rehabilitation regardless of the disease group. **Clinical message:** The SIMBO can be used as generic screening identifying patients having a need for an intensified rehabilitation strategy.

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Free Paper Session 1G

Chair: Hans Bussmann

25. A randomized controlled trial assessing the efficacy of an upper limb self-rehabilitation programme among chronic Beninese stroke patients

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After stroke, approximately 80% of patients have upper limb impairment. Upper limb is then a key issue in neurorehabilitation. The objective of this study was to evaluate the efficacy of self-rehabilitation program of upper limb after stroke, in Benin. It was a randomised controlled trial concerning 59 patients presenting hemiplegia more than 6 months after stroke. The 28 patients of experimental group have executed a self-rehabilitation program during 8 week at home. The control group had 31 patients who received no treatment related to the study. Patients have been evaluated before the treatment (T0), at the end of the treatment (T1) and 8 weeks after later5T2). Le primary outcome was the manual ability assessed by ABILHAND Stroke for Benin. The secondary outcomes were: neurological impairments (Fugl-Meyer), manual dexterity (Box and Block Test, Wolf Motor Function Test) and quality of life (Whoquol-Brief). Two way repeated measure ANOVA in intention to treat was did for analysis. The experimental group improved significantly their manual ability in comparison to the control group ($p<0.001$). Within the experimental group, means difference were 10% between T1 and T0 (IC95%: 1.61 to 18.56), maintained at T2 (IC95%: 1.48 to 18.44). Quality of life also improved in the intervention group. The self-rehabilitation program for upper limb after stroke is feasible and efficient in Benin to enhances the manual ability for chronic stroke patients. The self-rehabilitation program is an intensive program including unimanual and bimanual functional exercises, repeating movements of the daily life of patients.

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26. Which factors influence the implementation of e-rehabilitation for stroke patients? A focus group study

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Introduction*:* Despite growing number of e-health services in stroke rehabilitation, their implementation is insufficient. **Objective***:* Explore factors influencing the implementation of e-rehabilitation in stroke care. **Patients***:* Adult stroke patients/informal caregivers and professionals (physiatrists, physical therapists, occupational therapists, psychologists, managers) involved in stroke rehabilitation. **Methods***:* Qualitative design; six focus groups conducted with patients/caregivers and two with professionals were audiotaped, transcribed in full and analyzed by direct content analysis. **Results**: Fifty-three patients (mean age 57 years, 59% male), 15 caregivers (mean age 61 years, 27% male), 13

professionals (23% male) participated. 562 quotes about factors influencing implementation of e-rehabilitation were made by patients/caregivers, 280 by professionals. These quotes could be divided for patients/caregivers and professionals into; respectively 234(42%) and 108(39%) concerning factors involving the content of e-rehabilitation, 70(12%) and 98(35%) concerning the organisational context, none and 43(15%) concerning professional motivation to change, skills and knowledge, 237(42%) and 16(6%) concerning patient characteristics (stroke-related impairments) and 21(4%) and 15(5%) concerning financial arrangements. **Discussion and Conclusion**: All stakeholders reported an added value of e-rehabilitation. Both patient/caregivers and professionals reported most factors regarding the content of e-rehabilitation, for patients/caregivers followed by stroke-related impairments and for professionals by organizational constrains. *Clinical message:* The identified factors influencing implementation ask for a different focus of the implementation strategies for patient/caregivers and professionals. While both strategies should focus on the added value of e-rehabilitation, the strategy for professionals should solve organizational constrains, for patients/caregivers it should facilitate the use by tailoring e-rehabilitation to stroke-related impairments.

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27. Lower exercise capacity related to cognitive impairments in Out-of-hospital cardiac arrest survivors

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Introduction: Hypoxic brain injury is described in up to 40% of survivors after out-of-hospital cardiac arrest (OHCA). Besides cognitive impairments, lack of circulation may also affect exercise capacity. It is not known if exercise capacity of patients with cognitive impairments differs from other OHCA survivors. **Objective:** Determine exercise capacity in OHCA survivors with and without cognitive impairments. **Patients:** Retrospective study including 65 patients with myocardial infarction (MI) as cause of OHCA. **Methods:** Patients ≥18 years with MI as cause of OHCA admitted for cardiac rehabilitation (between February 2011 and April 2014). Cognitive functioning was determined with Mini-Mental State Examination (<28), Cognitive Failures Questionnaire (>32) and Informant Questionnaire on Cognitive Decline in the Elderly >3.6). Exercise capacity (VO2peak), workload (Watts) and blood pressure (mmHg) were measured at maximum cardiopulmonary exercise. Heart rate (bpm) was measured at rest and maximum exercise and Metabolic Equivalents of Tasks (METs) were calculated. **Results:** Included were 65 patients (85% male, median age 60 years). Of 53 patients cardiopulmonary exercise data was available. Nine patients (17%) showed cognitive impairments. Significant differences in exercise capacity were found between patients without and with cognitive impairments: VO2peak (median 19.7 vs 14.5 ml/kg/min), workload (median 143.5 vs 130.0W) and MET's (median 5.6 vs 4.1) ($p<0.05$). No significant differences for heart rate or blood pressure. **Discussion and conclusions:** A correlation is found between cognitive impairments and lower exercise capacity in patients after OHCA. **Clinical Message:** Rehabilitation programs should take lower exercise capacity of patients after OHCA with cognitive impairments into account.

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28. Predictive modeling and reference values for peak power output in handcycling of people with a chronic spinal cord injury

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Introduction: Step size in a graded exercise test (GXT) is based on estimated peak power output (POpeak). Estimating and interpreting POpeak is hard in individuals with spinal cord injury (SCI) when experience with GXTs in this group is lacking. **Objective**: To develop and validate predictive models for POpeak in a handcycling GXT for people with SCI. To define reference values for POpeak based on lesion level and sex. **Patients**: 98 Recreational handcyclists with SCI/spina bifida. **Methods**: PO was measured during a handcycling GXT. Four multi-level linear regression models were developed based on 80% of the data: two theoretical and statistical models with POpeak and POpeak/kg as dependent variable. Models were validated using 20% of the data (predicted versus measured POpeak). Reference values were based on percentiles of the whole group. **Results**: The theoretical models were based on age, sex, body mass index (BMI), time since injury (TSI), lesion level and motor completeness (AIS). The ICC was 0.47 for POpeak (R^2=29%) and 0.72 for POpeak/kg (R^2=27%). The statistical models were based on BMI and lesion level for POpeak/kg, and included also sex for POpeak. The ICC was 0.46 for POpeak (R^2=30%) and 0.48 for POpeak/kg (R^2=18%). **Discussion and conclusions**: All models showed low explained variance and moderate validity. In the future, predictions might be improved by adding determinants like training status and/or increasing participant numbers. **Clinical message**: BMI, lesion level and sex are determinants for POpeak in handcycling. POpeak is lower in women and individuals with a high lesion level.

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Free Paper Session 1H

Chair: Jan Ekholm

29. Use and usability of custom made ankle-foot orthoses for calf muscle weakness in polio survivors

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Dorsiflexion-restricting ankle-foot orthoses for calf muscle weakness (DR-AFOs), prescribed to reduce walking and standing related problems, do not always result in adequate usability in terms of perceived effectiveness and satisfaction, which may compromise use. To assess the use and usability of custom-made DR-AFOs in polio survivors with calf muscle weakness, prescribed at our rehabilitation department between 2004 and 2015. Fifty-two patients were sent a questionnaire to assess perceived health status (SF-36), and DR-AFO 'context' and 'prescription goals'. Furthermore, DR-AFO 'use', 'perceived effectiveness' and 'satisfaction' (D-QUEST) were assessed. Differences between users and non-users on these aspects were tested with Mann-Whitney U or Fisher's exact tests. Thirty-five questionnaires were completed and returned. Twenty-six patients used their DR-AFO, nine did not. Compared to users, non-users were significantly ($p<0.05$) more often female, first time DR-AFO receivers, and fallers. Also, they experienced less overall effectiveness on prescription goals and satisfaction on DR-AFO related aspects, particularly comfort and dimension. Our study shows that 74% of the patients used their DR-AFO. A low satisfaction and perceived benefit from the DR-AFO, mainly in women, may be associated with non-use. These findings are in line with studies on other AFO types and in other patient groups. To promote effective and satisfied use, and possibly to reduce risk of falling, we recommend to pay specific attention to first time users, especially females, and their treatment goals before DR-AFO prescription. And also to monitor use and usability after DR-AFO provision, and, when indicated, adjust the DR-AFO to improve these outcomes.

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30. Compensation strategies during gait in patients with calf muscle weakness and their relevance for ankle-foot orthoses

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Introduction: Patients with calf muscle weakness suffer from a reduced push-off. To maintain their walking speed patients have to compensate by producing more work elsewhere. Knowledge about these compensations can be useful in defining the required functions of ankle-foot orthoses. **Objective:** The aim of this study was to examine which compensatory strategies during walking are used by patients with unilateral calf muscle weakness. **Method:** Seventeen patients with unilateral calf muscle weakness and 10 healthy controls participated. A 3D gait analysis was assessed walking barefoot on a standardized non-dimensional walking speed of 0.4. Positive and negative work (in J/kg) for the hip, knee and ankle joint were calculated and summed to get ipsilateral leg work (calf muscle weakness leg) and contralateral leg work. **Results:** Patients performed less ipsilateral positive work at the ankle (0.19±0.10 vs 0.31±0.04 J/kg, $p<0.001$) but performed more ipsilateral hip work (0.41±0.09 vs 0.27±0.07 J/kg, $p=0.001$). Positive contralateral leg work was higher in patients compared to controls (0.92±0.14 vs.0.69±0.13 J/kg, $p<0.001$). Negative contralateral leg work was also increased (-0.76±0.12 vs -0.57±0.10, $p<0.001$), mainly in the loading response. **Discussion & conclusion:** Patients

with unilateral calf muscle weakness compensate for a reduced push-off by increasing positive work at the ipsilateral hip and contralateral leg. Negative work in the contralateral leg was also increased, which reflects the increased energy losses at contralateral heel-strike due to a reduced ankle push-off. **Clinical message:** This study stresses the importance that orthoses should assist ankle power to reduce negative work in the loading response.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_357257_hFA152fy23.png
Caption 1: Figure 1. Positive and negative work for the separate joints during the gait cycle

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31. Effect of varying ankle foot orthosis stiffness on gait biomechanics and walking energy cost in patients with neuromuscular disorders exhibiting calf muscle weakness

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Introduction: To normalize the ankle dorsiflexion and reduce the walking energy cost in patients calf muscle weakness, a spring-like ankle-foot-orthosis (AFO) can be provided. Simulations have shown that the efficacy of spring-like AFOs is stiffness dependent. Whether varying AFO stiffness really affects gait in these patients is unknown. **Objective:** This study aims to determine how AFO stiffness effects gait biomechanics, walking energy cost and speed in neuromuscular disorder patients with calf muscle weakness. **Method:**Twenty-four neuromuscular disorder patients exhibiting calf muscle weakness participated (MRC calf: median 3 (range 0-5)). Patients received a custom-made AFO of which the stiffness could be varied using five replaceable carbon leaf springs (CA7, Otto Bock, Germany). For all stiffness's and shoes only, a 3D gait analysis and 6-minute walking test were performed to assess peak ankle dorsiflexion, peak ankle power and walking energy cost. **Results:** Peak ankle dorsiflexion and peak ankle power reduced with increasing AFO stiffness (both $p<0.001$). Walking energy cost reduced and walking speed increased when wearing the AFO compared to shoes only ($p<0.05$), but no effect additional effect of AFO stiffness was found ($p=0.163$, $p=0.132$). **Discussion & conclusion:** Increasing AFO stiffness reduced maximal ankle dorsiflexion but negatively affected ankle power in patients with calf muscle weakness. Walking energy cost improved when using the AFO but varying AFO stiffness had no additional effect, most likely because optimal AFO stiffness differs between patients. **Clinical message:** Patients should be provided with the lowest sufficient AFO stiffness for normalizing ankle dorsiflexion to maintain ankle power.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_357266_GV9UxOKgyS.png
Caption 1: Table 1: effect of AFO stiffness on ankle dorsiflexion, ankle power and walking energy cost

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32. Effect of innovative custom-made footwear concepts on plantar pressure relief and patient satisfaction in patients with diabetes mellitus

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Introduction: Pressure-distributing footwear aims to prevent foot ulcers in diabetes. **Objective:** To compare pressure relief and satisfaction between several innovative custom-made footwear concepts for high-risk diabetic patients. **Patients:** Diabetic patients at high risk of ulceration **Methods**: In-shoe pressures were measured in four innovative footwear concepts and standard shoes during comfortable walking in twenty-four patients (15 male, mean age 65.8 years). All concepts used dynamic plantar pressure information for footwear design and optimization: one used barefoot data (TrueContour insole), two in-shoe data (DIAFOS-A shoe and DIAFOS-B insole), and one both (DIABETEC insole). The concepts varied in their use of scientific-based design principles and materials for shoe/insole construction. Insoles were worn in the same extra-depth rocker shoe. Patient satisfaction was scored 0 to 10. **Results:** Forefoot peak pressures were significantly lower for all innovative concepts compared to the standard shoe (13-53% relief, P<.02). Significantly lower metatarsal head peak pressures were found in DIAFOS-A (mean 117-141 kPa) and DIAFOS-B (112-155 kPa), compared to DIABETEC (119-173 kPa) and TrueContour (134-199 kPa) (P<0.05). In >91% of DIAFOS concept cases, peak pressures were below a 200kPa pressure threshold indicative for ulcer prevention. Patient satisfaction was moderate to good (5.8 to 8.3), with no significant differences present between concepts. **Conclusions:** The results support the use of a scientific-based data-driven protocol and in-shoe pressure measurements for footwear design and optimization. The studied design and manufacturing principles may be used to define the most effective shoe for ulcer prevention in high-risk diabetic patients.

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Free Paper Session 1I

Chair: Martine de Muynck

33. Comparison of the effect of Platelet Rich Plasma (PRP) with Hyaluronic Acid (HA) injections to treat chronic Jumper's knee

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Introduction: Patellar Tendinopathies (PT) represent a very frequent disorder which incidence can reach 30-50% among jumping sports. This trouble is often rebel to classical treatment. **Objective**: To compare the efficacy of a single injection of RPR to a double infiltration of HA at one week interval. **Patients/Methods**: Thirty-three patients suffering from PT were enrolled into the study and split into two randomized groups . Eighteen patients (Group 1) have received one PRP injection and the other fifteen subjects (Group 2) received two HA infiltrations. Pain and functionality of the knee were evaluated before injection (T0), 6 weeks (T2) and 3 months (T3) after injections: pain with VAS and pressure algometer, algofunctional scores with IKDC and VISA-P questionnaires, ultrasound, isokinetic evaluation (quadriceps contractions : concentric 60°/sec (C60), concentric 240°/sec (C240), excentric 30°/sec (E30) and VAS during testing). **Results**: At baseline, difference existed only between groups for algometer, tendon thickness and axial hypoechoic area. In both groups, VAS, algometer, IKCD, VISA-P, VAS for isokinetic testing C60, C240 and E30 were significantly improved at T2 and T3 compared to T0. Comparison between the 2 groups showed no difference excepted for algometer, tendon thickness (T2, T3) and axial hypoechoic area (T2). **Discussion and conclusions**: There existed a similar improvement of the symptoms in both groups. PRP has already shown its efficacy in PT. HA should probably be a new therapeutic opportunity in this indication. Nevertheless, it should better, for further studies, to include a more homogeneous population and a longer follow-up period of time.

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34. Hyaluronan in the treatment of painful Achilles tendinopathy

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Introduction: A randomized, controlled and multi-center trial was performed to investigate and compare safety and efficacy of hyaluronan (HA) injections with extracorporeal shock wave therapy in the treatment of painful Achilles tendinopathy. **Methods:** Adults presenting Achilles tendinopathy for at least 6 months and pain intensity score of at least 40 mm (VAS 100 mm). 62 participants were randomized and 59 analyzed. No withdrawal due to adverse effects occurred. Two peritendinous HA injections compared to three ESWT applications in weekly interval were administered. The patients underwent 3 follow-up visits post treatment. Primary criterion was VAS pain at 3 months post-treatment. **Results:** HA treatment was shown to provide clinical relevant in Achilles tendinopathy. For VAS pain large superiority of HA-group was observed. Better improvement of pain in HA-group was also obtained at 4 weeks and 6 months. Advantage of HA treatment was confirmed by VISA-A, CGI and clinical parameters. Evaluations were performed by blinded observers. A

total of 10 adverse events, 4 in HA31 group and 6 in ESWT-group were reported, none classified as serious. **Discussion:** Results show justification of both regimes in the treatment of Achilles midportion tendinopathy, but significant advantage of HA-treatment was seen throughout the entire study duration. Evaluation of VAS pain and VISA-A score revealed clinically meaningful results in patients receiving HA treatment. **Conclusions–Clinical message:** Two peritendinous HA injections revealed higher treatment success in Achilles midportion tendinopathy compared to standard ESWT.

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35. Translation and Validation of the VISA-P Questionnaire for French-Speaking Patients

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Background: The Victorian Institute of Sport Assessment-Patella (VISA-P), originally developed in English, assesses the severity of patellar tendinopathy symptoms. To date, no French version of the questionnaire exists. **Objectives:** The aim of our study was to translate the VISA-P into French and verify its psychometric properties. **Methods:** The translation and cultural adaptation were performed according to international recommendations in 6 steps: initial translation, translation merging, back translation to the original language, use of an expert committee to reach a prefinal version, test of the prefinal version, and expert committee appraisal of a final version. Afterward, the psychometric properties of the final French version (VISA-PF) were assessed in 92 subjects, divided into 3 groups: pathological subjects (n = 28), asymptomatic subjects (n = 22), and sports-risk subjects (n = 42). **Results:** All members of the expert committee agreed with the final version. On a scale ranging from 0 to 100, with 100 representing an asymptomatic subject, the average □ SD scores on the VISA-PF were 53 □ 17 for the pathological group, 99 □ 2 for the healthy group, and 86 □ 14 for the sports-risk group. The test-retest reliability of the VISA-PF was excellent, with good internal consistency. Correlations between the VISA-PF and divergent validity of the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) were low, and the correlation coefficient values measured between the VISA-PF scores and converged items of the SF-36 were higher. **Conclusion:** The VISA-PF is understandable, valid, and suitable for French-speaking patients with patellar tendinopathy.

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36. Effects of arthrodesis and rehabilitation in patients with osteoarthritis or rheumatoid arthritis of the proximal or distal interphalangeal phalanx joint: results of the Amsterdam hand cohort

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Study Design: Prospective observational cohort study. **Introduction:** Osteoarthritis (OA) and rheumatoid arthritis (RA) of the proximal or distal interphalangeal phalanx (PIP or DIP) joints results in impairments and activity limitations. Studies addressing the effects of an arthrodesis mainly focus on the effects on impairments. **Purpose of the study:** To evaluate the effects of PIP or DIP arthrodesis and rehabilitation on activity limitations in patients with OA or RA.**Methods:** Participants of the Amsterdam hand (AMS-hand) cohort were screened for eligibility. Selection criteria: indicated for

primary PIP or DIP arthrodesis without other hand surgery. Intervention: Zuggertung osteosynthese and rehabilitation. Measurements: before, 3 and 6 months after surgery. Primary outcomes: patient-specific activity limitations(Canadian Occupational Performance Measure [COPM]). Secondary outcomes: range of motion (ROM), strength (kg), pain (Numerical Rating Scale [NRS]), hand-specific activity limitations (Australian/Canadian [AUSCAN], Osteoarthritis Hand Index, the Disabilities of Arm, Shoulder and Hand [DASH] and the Michigan Hand Outcomes Questionnaires [MHQ]), and patient-specific (COPM), hand-specific (MHQ) and global satisfaction. **Results:** 25 patients age (mean±SD) 60.6±11y.; 22 [88%] female; 18 [72%] OA, underwent surgery of 26 hands and 32 (20 [63%] DIP) joints. Patient-specific activity limitations decreased at 3 months (COPM 1.2±2.5, p=0.05). Grip strength increased on some outcomes. Pain decreased (NRS -2.0±3.5, p=0.039). Hand-specific activity limitations decreased on all outcomes (AUSCAN -4.0±4.6, p=0.005; DASH -6.0±9.0, p=0.026; MHQ 9.8±12.8, p=0.017). Patient-specific (COPM -2.0±2.3, p=0.001), hand-specific (MHQ 22.8±24.8, p=0.009), and global satisfaction increased. **Conclusions:** PIP of DIP arthrodesis and rehabilitation decreased activity limitations in patients with OA or RA.

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Mini-symposia and workshops - index

Thursday 9 November

Parallel Session 2 – Mini-symposia and workshops

Thursday 10 November, 14.05-15.35

Parallel Session 2: Workshops and mini-symposia

2A. Parental participation and engagement in paediatric rehabilitation: Needs, Wishes and Opportunities
2B. Practical Pointers on Participation in Pediatric Rehabilitation: Guidelines & Measures
2C. Neuropsychology beyond pen-and-paper
2D. Neurophysiological techniques for functional quantification and prognosis in multiple sclerosis
2E. Pain treatment in patients with underlying medical disease
2F. Participate in sports: ' no pain, no gain'
2G. Precision orthotics to improve the effectiveness of orthopedic assistive devices
2H. Activities towards rehabilitation service implementation
2I. How to (better) support medical rehabilitation patients in participation and autonomy
2J. E-health in progress
2K. Rehabilitation Medicine: What do doctors do every day and why it is fun!

2A. Workshop: Parental participation and engagement in paediatric rehabilitation: Needs, Wishes and Opportunities

Over the last decades family centred care has become the accepted paradigm in Dutch rehabilitation care. Parents and professionals aim to collaborate in partnership using a request oriented approach. Governmental policies create a more steering role for parents in the organization of the care of their child, for example in applying for fees and aids, and managing daily care in the context of the family. Parental engagement and participation are increasingly considered essential aspects of the rehabilitation process. But what exactly do these concepts mean to parents and to professionals? Besides the confusion accompanying all different interpretations, the developments also ask new competences of professionals in order to tune in to parents and children they work with. However, not all parents as well as professionals are optimally equipped for filling in their roles. In the last years parental needs and wishes have been studied and various tools have been developed to engage and involve parents in the care process of their child. In this workshop examples of such initiatives and tools and the way they have been developed will be presented. Also perceptions of professionals on the value, challenges and opportunities with regard to parental engagement and participation will be discussed.

Chair: Mattijs Alsem, rehabilitation physician (NL)

Speakers: Ruud Wong Chung, Pediatric Physiotherapist and Educationalist (NL), Marjolijn Ketelaar PhD Senior researcher (NL), Johannes Verheijden Governance Coordinator Care (NL)

2B. Mini-symposium: Practical Pointers on Participation in Pediatric Rehabilitation: Guidelines & Measures

Participation, defined by the World Health Organization as "involvement in a life situation", is essential for child and youth development and an important outcome of rehabilitation interventions. Studies in Europe and North America have consistently shown that the participation of children and youth with disabilities is significantly lower than their peers without disabilities. In this symposium, findings from research on participation and the influence of the environment for children and youth with disabilities will be explored. We will then discuss participation assessments, and provide an overview of outcome measures and recommendations from the Dutch Guidelines for Cerebral Palsy. The Participation and Environment Measure for Children and Youth (PEM-CY), the Young Children's Participation and Environment Measure (YC-PEM) and the Children's Assessment of Participation and Enjoyment (CAPE) will be discussed in detail. These validated measures, available in English and Dutch, enable clinicians and researchers to examine child and youth participation in home, school and community settings. Finally, we will introduce resources from CanChild's Participation Knowledge Hub and highlight how these resources can be used to engage youth, parents and community partners. Throughout the symposium, we will share client stories and video clips to illustrate the importance of addressing participation in clinical practice.

Chair: Rachel Teplicky

Programme

1. (NL)PEM-CY, YC-PEM and CanChild's Participation Knowledge Hub - *Rachel Teplicky, Occupational Therapist (CAN)*
2. CAPE_ and PEM-CY_NL- *Barbara Piskur Senior researcher and educator (NL)*
3. Assessment of young children's participation and environment for early childhood research and care planning - *Mary Khetani, Assistant Professor, Occupational Therapy (USA)*
4. Participation - Dutch Guidelines for Children with Cerebral Palsy - *Jeanine Voorma, Pediatric physiatrist (NL)*
5. Practical Pointers / Resources - Participation Hub CanChild/NetChild - *Jan Willem Gorter, Physician, Director of CanChild, and Professor (CAN)*

2C. Mini-symposium: Neuropsychology beyond pen-and-paper

Cognitive impairment is a serious, disabling consequence of stroke, with major impact on especially activities of daily living and participation in rich and dynamic surroundings. Proper assessment of cognitive impairment is therefore of utmost importance, yet the traditional neuropsychological pen-and-paper tests are generally not sensitive enough to capture (mild) cognitive impairment nor able to properly predict quality of activities of daily living. This mini-symposium will move away from traditional neuropsychology and beyond pen-and- paper assessment reviewing and reporting new insights from digitised neuropsychological assessment, experimental paradigms, including eye movement recordings, pupillometry, and virtual reality simulations.

Chair: Tanja Nijboer

Programme

1. The relation between cognitive complaints in daily life and the outcome of neuropsychological assessment: preliminary results – *David Sluiter, Junior Researcher (NL)*

2. Dynamic outcome measures in neuropsychological assessment – *Teuni Ten Brink, PhD student (NL)*
3. Feasibility of virtual reality and patients preferences for display of virtual reality – *Floor Verheul, resident(aios) (NL)*
4. The use of Virtual Reality simulations in cognitive assessment – *Lauriane Spreij, PhD student (NL)*
5. Gaming technology in the cognitive rehabilitation of spatial navigation impairments – *Milan van der Kuil PhD student (NL)*

2D. Mini-symposium: Neurophysiological techniques for functional quantification and prognosis in multiple sclerosis

Multiple Sclerosis (MS) is a chronic inflammatory disease characterized by myelin sheath destruction along with a focal or diffuse axonopathy of the central nervous system. The axonal loss is closely linked to disability, as demonstrated by modern magnetic resonance imaging. The individual clinical course prognosis is tricky because of the clinical variability and complexity of MS. Electrophysiology provides functional quantitative data on multimodal afferent and efferent pathways through cerebral and spinal long tracks. It will be shown in this symposium: 1) that multimodal (motor, visual, somatosensory) evoked potentials (EP) correlate with clinical scales such as the Expanded Disability Status Scale (EDSS) and with the motor components of Multiple Sclerosis Functional Composite (MSFC) including the 9 Hole Peg Test (9HPT) and the Timed 25 Foot Walk (T25FW), 2) how multimodal EP may be used as a biomarker of the MS disease, 3) what models, using a multivariate approach, may be proposed for the risk estimation of clinical aggravation, 4) that the Triple Stimulation Technique (TST), applied to the upper limbs, correlates not only to the hand dexterity and grasping strength but also to the walking capacity.

Chair: Dominique Dive

Programme

1. TST : technique - *François Wang, Medical Doctor (BE)*
2. Application of the TST as a surrogate marker of axonal loss in a population of patients with multiple sclerosis - *Xavier Giffroy, Physiotherapist (BE)*
3. Multimodal evoked potentials : procedure and results in MS patients - *Dominique Dive, Medical Doctor (BE)*

2E. Mini-symposium: Pain treatment in patients with underlying medical disease

In 2003, almost one in five surveyed Europeans reported having moderate or severe chronic pain. This group includes persons with musculoskeletal pain, but also patients with chronic pain due to an underlying disease, such as diabetic neuropathy, CRPS, spinal cord injury and neuropathic pain. Chronic pain markedly decreases individuals' health status and quality of life and it can interfere with everyday activities and sleep. Recent studies have confirmed previous evidence of the enormous indirect socioeconomic costs due to chronic pain.
In the last decades, for musculoskeletal pain, rehabilitation treatments have been developed that can effectively help patient to cope with pain and decrease the level of disability. But what about individuals with pain related to an underlying disease? Their pain complaints are often based on neuropathic pain or a combination of different pain problems. Pain medication can help, but as a single treatment alone, it is often unsatisfactory. Can we help these patients by translation knowledge out of the field of pain-rehabilitation into the development of combined (medical and behavioural) treatments to increase their quality of life? In this minisymposium we will discuss treatment for pain in patients with painful diabetic neuropathy, polyneuropathy, spinal cord injury and complex regional pain syndrome. We will focus on current evidence on adequate medication. But we will also discuss latest findings for rehabilitation for these patient groups.

Chair: Henrica Schiphorst Preuper, Rehabilitation Physician (NL)

Programme

1. The burden of Painful Diabetic neuropathy; Physical Activity and Quality of Life – *Charlotte Geelen, Rehabilitation Physician*
2. Pain treatment in patients with underlying medical disease - *Robert van Dongen MD PhD, Anesthesiologist*
3. Pain in spinal cord injury – *Janneke Stolwijk, Rehabilitation Physician*
4. Neuropathic pain and pharmacotherapy: a guidance for the non-neurologist – *Brigitte Brouwer, neurologist*

2F. Workshop: Participate in sports: ' no pain, no gain'

Although we know the risks of inactivity, the level of sport participation or habitual exercise is low. Promoting healthy behaviour change is a challenge. For our patients, determinants of inactivity may not only be socioeconomic status and age, but also the presence of physical and cognitive limitations. Additionally, being 'pressured for time' is often used to justify an inactive life style. Therefore, with more time at hand (or less time consuming training), we may be able to instigate and sustain sport participation. When working with the sports medicine physicians, we learnt more about HIIT (high intensity interval training). Its selling point: 'a little pain, but a lot of gain'. This training method may be more easy tot sustain en may prove effective in different patient populations. During this workshop, you will learn about the determinants of sport participation in the general and in the rehabilitation population. You will learn about the time efficient strategy of HIIT and how it can work for you and your patients. And then, and this is the reason why YOU will participate our workshop: 20 minutes of HIIT.

Chair: Janneke Haisma, rehabilitation physician (NL)

Programme

1. Training of Elite endurance athletes and patients ; similarities and differences – *Louis Delahaije movement scientist, trainer/coach, Trainer/coach Lotto/Jumbo Cycling team, Dutch Triatlon association*
2. Transferring knowledge from sports related exercise physiology towards training of patients in a rehabilitation-programme – *Rob Riksen – physician for. Rehabilitation RAP rehabilitation practice Heerlen/Brunssum*
3. How to train the most vulnerable during and after rehabilitation? – *Linda Valent – movement scientist, occupational therapist, Rehabilitation centre Heliomare, Wijk aan Zee*
4. HIIT in Rehabilitation Medicine – *Maremka Zwinkels – PhD candidate Center of Excellence for Rehabilitation Medicine*

2G. Mini-symposium: Precision orthotics to improve the effectiveness of orthopedic assistive devices

The application of assistive devices, such as lower limb orthoses and orthopedic footwear is among the core areas of multidisciplinary rehabilitation expertise. However, the evidence with regard to their effectiveness is ambiguous, with both beneficial and poor outcomes reported. It is expected that poor functioning of the device can be attributed to an inadequate match between the orthotics' design and the patient's impairments, which calls for precision orthotics, i.e. the tailoring and optimization of the intended bio-mechanical mode of action of assistive devices to the specific patient. The prospect of this approach is that it may lead to improvement of treatment outcome, i.e. the development

of orthotic devices that are fully personalized, based on (bio) mechanical analysis and using modified body fitting, which is expected to maximize use, and prevent misuse or unused potential of assistive devices.

Chair: Frans Nollet

Programme

1. Introduction on the concept of precision orthotics as an approach for improving the effectiveness of orthopedic assistive devices – *Frans Nollet, rehabilitation medicine specialist (NL)*
2. The value of precision diagnostics for optimizing the stiffness mode-of-action of ankle-foot-orthoses will be shown – *Merel Brehm, senior researcher (NL)*
3. An overview will be given of current state-of-the-art in optimizing foot orthoses by the use of finite element approaches – *Jim Woodburn, rehabilitation medicine specialist (Scotland)*
4. Insight will be given the value foot pressure-driven optimization of orthopedic footwear – *Sicco Bus, senior researcher (NL)*

2H. Mini-symposium: Activities towards rehabilitation service implementation

The increase of survival rate in many chronic diseases has led to the increase of people with non-communicable diseases. After the adoption of Global Disability Action Plan 2014-2021 by World Health Assembly in 2014, many countries realized the importance of establishing or improving strengthening rehabilitation services. Strengthening health-related rehabilitation services must start from the needs of persons with health conditions experiencing disability. According to human rights and ethical principles, society must respond to these needs e.g. by inclusion and universal design or by appropriate rehabilitation services that should be implemented within health systems. Methodologically, the implementation of rehabilitation services in health systems should be planned and realized according to the six health systems building blocks of WHO. However, it is crucial to develop recommendations based on a situation analysis and the best available data. To facilitate such data collection at country levels, a checklist has been developed and a related questionnaire has been developed and tested in three countries to support the development of National Disability, Health and Rehabilitation Plans. This Mini-Symposium will present the assessment and evaluation tools for service implementation, the development of rehabilitation service implementation in Ukraine and how the rehabilitation service and social security in Latvia.

Chair: Prof. Christoph Gutenbrunner, Head of Department (DE) and Boya Nugraha

Programme

1. Assessment and evaluation tools for rehabilitation service implementation – *Boya Nugraha Researcher (DE)*
2. Rehabilitation system developing in Ukraine: from USSR to Europe – *Volodymir Golyk, Director, Neurologist (UKR)*
3. Medical rehabilitation service and social security policy in Latvia – *Aivars Vetra, Director (LVA)*

2I. Mini-symposium: How to (better) support medical rehabilitation patients in participation and autonomy

This year's congress theme underscores that participation in family and social life are the ultimate goals of rehabilitation medicine. The premise of this mini-symposium is that diverging approaches to rehabilitation treatment exist and that some may be more effective to support participation and autonomy of people with disabilities than others. During this mini-symposium four speakers will present results from rehabilitation research and clinical

experience to inspire the participants to reflect on how rehabilitation medicine supports participation in everyday practice. Options to improve on this will be offered and possible practical consequences for the rehabilitation practices will be discussed with the symposium participants.
The speakers will address the following topics:

- Participation and autonomy of people with disabilities: how successful are we to date?
- How do professionals promote autonomy and a sense of agency during the rehabilitation period.
- Practical ways for professionals tobe effective in learning patients to participate: "In search of a meaningful context".
- A new perspective on rehabilitation outcomes based on the principles of positive health (i.e. agency and social welfare).

Chair: Marcel Post

Programme

1. Participation problems in people with physical disabilities – *Marcel Post, researcher (NL)*
2. Autonomy as a precursor for experiencing participation – *Dominique van de Velde, reseacher - occupational therapist (BE)*
3. "Meaningful context" as a strong rehabilitation tool – *Inge Vuijk, director (NL)*
4. A new perspective on rehabilitation outcomes based on the principles of positive health – *Coen Vuijk, Initiator & Trainer (NL)*

2J. Mini-symposium: E-health in progress

The usage of e-health will increase rapidly in the coming years, one of its main drivers being the need to ensure, despite reduction of health care budget, access to health care for the growing number of elderly people and people with chronic conditions. E-health applications can support people's self-management, by offering innovative solutions for the delivery of information, the monitoring of relevant aspects of health status, the provision of tailored advice and treatment and interaction with health care providers and peers. The successful and sustained adoption of e-health in health care requires a comprehensive, structured and professional approach, including all relevant stakeholders, i.e. clinicians, managers, directors, patients and their caregivers, health insurance companies, supervisory bodies and policy makers. Professionals' knowledge and skills need to be developed and monitored, a quality system needs to be in place, as well as the physical infrastructure and financial resources to deliver e-health services. The mini-symposium "E-health in progress" addresses the current status of various aspects of e-health in the rehabilitation setting, according to a selection of recent of ongoing projects in The Netherlands.

Chair: Arend de Kloet

Programme

1. Trending topics in Ehealth in rehabilitation – *Bert Mulder, Associate professor (NL)*
2. Policy making in e-Rehabilitation – *Hans van Dijk, consultant (e-)Rehabilitation (NL)*
3. Caregiver-mediated exercises with e-health support for early supported discharge after stroke (CARE4STROKE) – *Judith Vloothuis, Rehabilitation physician and researcher (NL)*
4. Fast@home – *Jorit Meesters, senior researcher (NL)*
5. E-health in practice – *Klaas-Jan van Haastrecht, coordinator SmartLab (NL)*

2K. Workshop: Rehabilitation Medicine: What do doctors do every day and why it is fun!

This workshop is for medical students of all years of medical school. Maybe you are not familiar with Rehabilitation Medicine. That is about to change! We inform you about everyday practise in Hospital and Rehabilitation Centre. What is rehabilitation medicine all about?. We show you special rehabilitation treatments and residents and students will tell about their experiences in medical school and during the residents training. We also include a student poster walk in the workshop to inform you about the wide area of research. You all will be judging the poster presentations and award a prise. Please feel welcome to hear and learn more about Rehabilitation Medicine! ***(students only)***

Chair: Clemens Rommers consultant in rehabilitation medicine (NL)

Speakers: Duco Steenbeek, consultant in rehabilitation medicine (NL), Marga Tepper, consultant in rehabilitation medicine (NL), Barbara Dekker, resident in Rehabilitation Medicine (NL)

Parallel Session 3 – Mini-symposia and workshops

Friday November, 08.30-10.00

Parallel Session 3: Workshops and mini-symposia

3A. Dyskinetic Cerebral Palsy – from movement disorder to targeted treatment
3B. Innovative environmentally-focused interventions to improve children's participation: the PREP and the PEM+
3C. Care during the chronic phase of recovery after stroke: patients' needs and organization of primary care
3D. Rehabilitation of low back pain: how to translate the latest scientific evidence into clinical practice?
3E. Multidisciplinary Rehabilitation for Post-Intensive Care Syndrome; towards better outcome after acute critical illness
3F. pARTicipation: performing arts medicine in rehabilitation
3G. Participation of elderly with a lower limb amputation - keep them walking
3H. Not wishing to participate… euthanasia in rehabilitation
3I. Moving towards measuring participation: from performance, self-management to participation and autonomy
3J. B-FIT! A guideline to individualized aerobic exercise in neuromuscular diseases.

3A. Mini-symposium: Dyskinetic Cerebral Palsy – from movement disorder to targeted treatment

Aim: to provide insights in the clinical presentation and relation with activities and participation in daily life, the etiology (including neuroimaging) and treatment of dyskinetic cerebral palsy.

Dyskinesia (dystonia and/or choreo-athetosis) is the dominant movement disorder in 15% of children with cerebral palsy. The severity of dystonia has a high influence on the limitations in activities and participation. Recognition of the different movement patterns is found to be difficult. Better evaluation and understanding of dystonia and choreo-athetosis are important to provide targeted and evidence based treatment. During this session, we'll address the recognition of the movement patterns seen in dyskinetic CP and its consequences on activities and participation in daily life. Furthermore the etiology and pharmacological and other treatment options (including intrathecal baclofen and deep brain stimulation) will be presented.

Chair: Annemieke Buizer, Pediatric Physiatrist (NL)

Speakers: Laura Bonouvrié, Pediatric Physiatrist (NL), Jeroen Vermeulen, Child Neurologist (NL), Yasin Temel, Neurosurgeon (NL)

Programme

1. General introduction – *Annemieke Buizer, Pediatric Physiatrist (NL)*
2. Clinical patterns and the influence on activities and participation – *Laura Bonouvrié, Pediatric Physiatrist (NL)*
3. Etiology and neuroimaging - *Jeroen Vermeulen, Child Neurologist (NL)*
4. Pharmocological treatment option
5. Intrathecal baclofen treatment – *Laura Bonouvrié*
6. Deep brain stimulation – *Yasin Temel, Neurosurgeon (NL)*

3B. Mini-symposium: Innovative environmentally-focused interventions to improve children's participation: the PREP and the PEM+

Meaningful participation in everyday activities plays a key role in the health and well-being of children. Research has shown that children with disabilities are often restricted in their participation and that the environment is one of the most important factors contributing to these restrictions. There is need for evidence-based and feasible interventions to facilitate environmentally-focused approaches to care. The Pathways and Resources for Engagement and Participation (PREP) and the Participation and Environment Measure - Plus (PEM+) are two complementary approaches that aim to facilitate client-centered assessment and care planning processes and, consequently, improve children's participation by modifying aspects of the environment and/or the task. In this session, we will present information about the development of these two intervention approaches, their principles, and evidence supporting their utility for practice. Evidence on the effectiveness of the PREP intervention will be presented, as well as preliminary data on the usability of the PEM+. Through case studies, the steps of each intervention approach will be illustrated and specific participation goals and corresponding intervention strategies for improving participation will be examined. Finally, practical resources that are available and under development will be shared to support informed use of PREP and PEM+ in the clinical setting.

Chair: Dana Anaby, Occupational Therapy (CAN)
Speakers: Mary Khetani, Occupational Therapy (USA), Rachel Teplicky, Laura Turner

Programme

1. Assessment and intervention related to child and youth participation and environment; PREP and PEM+ - *Dana Anaby, Occupational Therapy (CAN)*
2. Assessment of young children's participation and environment for early childhood research and care planning; PEM+ - *Mary Khetani, Occupational Therapy (USA)*
3. PREP and PEM+ and CanChild's Participation Knowledge Hub - *Rachel Teplicky and Laura Turner*

3C. Mini-symposium: Care during the chronic phase of recovery after stroke: patients' needs and organization of primary care

Patients longer than 6 months post-stroke are identified as in chronic stage of recovery. Despite important improvements in the treatment of stroke including thrombolysis, its impact on patients' lives in chronic stage of recovery is often considerable in different domains of functioning, due to significant cognitive, emotional and/or physical impairments in many patients. Despite the availability of insight into the extent of problems and limitations encountered by patients and their caregivers, knowledge on the optimal delivery of care in this stage is limited. Patients may have had different initial care trajectories, whereby duration and extent of follow-up by clinicians is also subject to variation. The sparse data indicate that health care usage is still substantial in many patients, yet at the same time there are unfulfilled health care needs. Whereas stroke chains of care usually focus on the better attunement of hospital care and care delivered in rehabilitation centers or nursing homes, more attention to the connection and collaboration with clinicians in primary care is needed. Primary care stroke networks may offer a solution, but little is known about their structure, processes and outcomes.

Chair: Thea Vliet Vlieland (NL)
Speakers: Joris de Graaf, Medical Doctor (NL), Henk Arwert, Rehabilitation physician (NL), Paulien Goossens, Rehabilitation physician (NL), Jetty Borcherts, Researcher/Psychologist (NL), Monique Tjon-a-tsjien, General practitioner (NL)

Programme

1. Long-term restrictions in participation in stroke survivors under and over 70 years of age – *Joris de Graaf, Medical Doctor (NL)*
2. Health care use and needs in chronic stroke patients – *Henk Arwert, Rehabilitation physician (NL)*
3. Primary care networks in stroke care in The Netherlands – *Paulien Goossens, Rehabilitation physician (NL)*
4. Primary care networks in stroke care in The Netherlands – *Jetty Borcherts, researcher/ psychologist (NL)*
5. Long-term secondary stroke prevention in The Netherlands – *Monique Tjon-a-tsien, general practitioner (NL)*

3D. Mini-symposium: Rehabilitation of low back pain: how to translate the latest scientific evidence into clinical practice?

Although most acute *low* back pain (LBP) episodes resolve within a few days or weeks, estimates of recurrence at one year range from 24% to 80% and pain becomes chronic in 10-20% of the patients. LBP therefore remains a major health problem and an economic burden for the society given its peak of incidence during working age. International guidelines for the management of LBP recommend self-management (via advice and information provided by the healthcare professionals), exercise, manual therapy and combined physical and psychological programs amongst the non-invasive and non-pharmacological interventions. This mini-symposium will be led by 4 experts in the field of LBP. They will discuss the latest scientific evidence regarding the effectiveness of these interventions and how to implement them into clinical practice based on sound clinical reasoning. Finally, new promising technologies for low back pain rehabilitation will be discussed with regard to feasibility for their use in rehabilitation settings and at home, their contribution to the effectiveness of rehabilitation in LBP, and possible working mechanisms. The attending healthcare provider will leave this mini-symposium with improved knowledge on the current best evidence-based rehabilitation treatment for patients with LBP, including the use of innovative technologies for rehabilitation that may create new opportunities for improved treatment effects in LBP.

Chair: Jeanine Verbunt, Professor of Clinical Epidemiology in rehabilitation medicine and consultant in rehabilitation medicine (NL)

Speakers: Christophe Demoulin, Assistant Professor (BE), Stéphanie Grosdent, Clinician and researcher (BE), Nathalie Roussel, Assistant Professor (BE), Annick Timmermans, Assistant Professor (BE)

Programme

1. Rehabilitation of low back pain: how to translate the latest scientific evidence into clinical practice? – *Jeanine Verbunt, Professor of Clinical Epidemiology in rehabilitation medicine and consultant in rehabilitation medicine (NL)*
2. Information and education for patients with LBP: what to tell them and how ? – *Christophe Demoulin, Assistant Professor (BE)*
3. Manual therapy "hands-on" techniques in LBP: why, how and for whom? – *Stéphanie Grosdent, Clinician and researcher (BE)*
4. Exercise & physical activity in LBP: why, how, when and how much? – *Nathalie Roussel, Assistant Professor (BE)*
5. Technology-supported rehabilitation for low back pain: feasibility, effectiveness and possible working mechanisms – *Annick Timmermans, Assistant Professor (BE)*

3E. Mini-symposium: Multidisciplinary Rehabilitation for Post-Intensive Care Syndrome; towards better outcome after acute critical illness

Survival of critically ill patients has dramatically improved, but significant multiple impairments often remain, resulting in long-lasting limitations in daily functioning, participation restrictions (such as employment) and diminished quality of life. Post–intensive care syndrome (PICS) describes these new or worsening impairments in physical, cognitive, or mental health status after critical illness that persist beyond hospitalization. PICS applies to a survivor or family member (PICS-F). PICS remains frequently unrecognised and, even when identified, is often not appropriately assessed and managed. Early rehabilitation in the ICU is safe and effective, and improves functional status at hospital discharge. Beyond this stage, there are no standardized rehabilitation pathways for survivors of critical illness.

The aims of this mini symposium are to present the current evidence on:

- The impact of PICS on daily functioning of ICU survivors and their families;
- The state of the art of PICS rehabilitation after hospital discharge, and
- To discuss how to set up multidisciplinary rehabilitation for PICS in the Netherlands.

After 4 inspiring presentations on PICS, it's consequences for participation, and challenges for Rehabilitation, we will discuss how we can set up a National Network offering high quality treatment of patients with PICS.

Chair: Marike van der Schaaf and Frans Nollet

Programme

1. Impact of ICU stay on functioning – *Marike van der Schaaf, senior researcher (NL)*
2. Patient experiences with post hospital rehabilitation – *Mel Major, Lecturer (NL)*
3. Implications for rehabilitation care – *Daniela Dettling-Ihnenfeldt, Physiotherapist (NL)*
4. Implementation of Optimum Care in a Rehabilitation Center – *Tijs van Bezeij, Rehabilitation Physician (NL)*
5. Interactive discussion: Towards multidisciplinary rehabilitation for PICS – *Frans Nollet, Henk Stam, head of Dept of Rehabilitation Medicine, AMC (NL), Henk Stam, head of Dept of Rehabilitation Medicine, Erasmus MC (NL) and Marike van der Schaaf*

3F Mini-symposium: pARTicipation: performing arts medicine in rehabilitation

Many musicians encounter participation problems while playing as their hobby, or professionally. Performing arts medicine is a field with increasing interest, also from the point of view of physical medicine and rehabilitation. This is not surprising when one considers that 10 percent of the general (and rehabilitation) population is engaged in making music. Every rehabilitation team can be confronted with three categories of musicians with participation problems; 1. Limitations as a result of making music, 2. Limitations in playing due to chronic illness or accident and 3. Budding musicians (children and adults) who would like to make music in an adapted way. The bio-psycho-social and interdisciplinary approach of rehabilitation medicine is suited to address these often chronic musculoskeletal problems. Because of the high complexity and the specific bio-psycho-social characteristics in the field of music medicine, special expertise and a network of the rehabilitation physician (and team) is needed for a successful treatment. A small group of enthusiastic rehabilitation physicians have set up music clinics throughout the Netherlands and joined their forces and expertise in the field of music medicine via the Dutch Performing Arts Medicine Association (NVDMG).

Chair: Kees Hein Woldendorp, Physiatrist (NL)

Speakers: Anandi van Loon-Felter, physiatrist (NL), Vera Baadjou, trainee in physical medicine and rehabilitation (NL), Marjon van Eijsden-Besseling, physiatrist (NL)

Programme

1. General introduction to the musician: what is so special about the musician? – *Anandi van Loon-Felter, physiatrist (NL)*
2. Musculoskeletal complaints in musicians; pathophysiology and prevention – *Vera Baadjou, trainee in physical medicine and rehabilitation (NL)*
3. Hypermobility in musicians; a gift or a burden? – *Marjon van Eijsden-Besseling, physiatrist (NL)*
4. One-handed musicianship; more than a gimmick?! – *Kees Hein Woldendorp, physiatrist (NL)*
5. Music participation problems at your clinic; what to do? – *Anandi van Loon-Felter*

3G. Mini-symposium: Participation of elderly with a lower limb amputation - keep them walking

In the Netherlands most people undergoing a lower limb amputation are over 65 years of age. Chronic peripheral vascular disease or diabetes mellitus has led to irreversible ischemia or a life threatening infection. Despite advances in preventative care, medical treatment and (peripheral) revascularisation procedures, in some cases, an amputation remains the best option for ending ongoing pain, hospitalisation and infection/ischaemia, and ultimately, enabling a person to live. Many adults aged 65 and over spend, on average, 10 hours or more each day sitting or lying down, making them the most sedentary age group. They're paying a high price for their inactivity, with higher rates of falls, obesity, heart disease and early death compared with the general population. As people get older, it becomes even more important to remain active if they want to stay healthy and maintain their independence. If people don't stay active, all the things they've always enjoyed doing and taken for granted may start to become that little bit harder. In this session we focus on how to keep elderly with an amputation of the lower extremity active and walking.
Chair: Clemens Rommers, Consultant in rehabilitation medicine (NL), Bert Kap, Consultant in rehabilitation medicine (NL)
Speakers: Ruul de Winkel, Elderly Care Specialist (NL), Henk van de Meent, Consultant in rehabilitation medicine (NL)

Programme
1. About the epidemiology of lower limb amputations and their treatment – *Clemens Rommers , Consultant in rehabilitation medicine (NL)*
2. Elderly people with an amputation: how to help them effectively – *Ruul de Winkel, Elderly Care Specialist (NL)*
3. Time from amputation to prosthesis and its impact on health in elderly – *Henk van de Meent, Consultant in rehabilitation medicine (NL)*
4. What can technology do for the elderly? – *Bert Kap, Consultant in rehabilititation medicine (NL)*

3H. Mini-symposium: Not wishing to participate··· euthanasia in rehabilitation

End of life decisions are extremely complex and demand ample prudence on the side of the patient, his family and health-care professionals. In Western countries there is an increasing acceptance of end of life decisions and euthanasia. Also in rehabilitation medicine, especially in neurodegenerative diseases (ALS), multiple sclerosis and spinal cord injury euthanasia is encountered. This mini-symposium aims to give a general outline of euthanasia in the Netherlands, discussing diagnose groups involved, incidence of euthanasia, procedure with 6 due care criteria and ethical aspects. Furthermore it will focus on the course of action in 3 cases of persons with spinal cord injury in

Belgium and the Netherlands in which euthanasia was discussed and in some cases granted. These euthanasia requests ranged from the acute phase at the intensive care unit in the hospital, to the inpatient post-acute rehabilitation and to the chronic phase.

Chair: Janneke Stolwijk-Swüste, Rehabilitation physician (NL)
Speakers: Bregje Onwuteaka-Philipsen, Professor of end-of-life Research (NL), Carlotte Kiekens, Rehabilitation physician (BE)

Programme

1. Introduction: content and objective mini-symposium – *Janneke Stolwijk-Swüste, Rehabilitation physician (NL)*
2. General outline of euthanasia in the Netherlands: diagnose groups involved, incidence, procedure: due care criteria, difference in countries, ethical aspects – *Bregje Onwuteaka-Philipsen, Professor of end-of-life Research (NL)*
3. Overview of the literature on end of life decisions and euthanasia in SCI – *Christel van Leeuwen, Psychologist (NL), Janneke Stolwijk-Swüste*
4. SCI: due care criteria and course over time – *Carlotte Kiekens, Rehabilitation physician (BE)*

3I. Mini-symposium: Moving towards measuring participation: from performance, self-management to participation and autonomy

Participation and autonomy are the ultimate goals of rehabilitation medicine and moving towards participation is the motto of this year's DCRM congress. Against this background the implementation of instruments to measure participation in research and everyday practice is urgent. In this mini-symposium we will highlight four recently developed measures of participation, discuss their advantages and disadvantages with the audience, and address ways to move forward towards routinely measuring participation as outcome of rehabilitation. Marcel Post (Groningen/Utrecht) will present the USER-Participation. This measure of objective and subjective participation has been successfully used in various countries and diagnostic groups. Dominique van de Velde (Ghent) will present the development, psychometric characteristics and the clinical application of the Ghent Participation Scale (GPS), an individualized measure of objective and subjective aspects of participation. Marjolijn Ketelaar (Utrecht) will present the Pediatric Evaluation of Disability Inventory Computer-Adapted Test (PEDI-CAT) which is being translated and validated as part of a European initiative. Coen van Bennekom (Wijk aan Zee) will present the development and pilot-testing of a self-management and autonomy measure, an instrument developed to measure how people participate in life domains without or with help from others and how much control they experience in these domains.

Chair: Marcel Post, Researcher (NL)

Speakers: Dominique van de Velde, Reseacher - Occupational therapist (BE), Marjolijn Ketelaar, Researcher (NL), Coen van Bennekom, Physician/researcher (NL)

Programme

1. Measuring objective and subjective participation with the USER-Participation – *Marcel Post, Researcher (NL)*
2. Measuring participation based on prioritized activities – *Dominique van de Velde, Reseacher - Occupational therapist (BE)*
3. The Pediatric Evaluation of Disability Inventory - *Computer Adaptive Test – Marjolijn Ketelaar, Researcher (NL)*
4. A new measure of self-management and autonomy – *Coen van Bennekom, Physician/researcher (NL)*

3J. Workshop: B-FIT! A guideline to individualized aerobic exercise in neuromuscular diseases

In this workshop we will discuss the application of aerobic exercise in neuromuscular diseases (NMD) and the perceived barriers, and learn participants how to work according to the B-FIT ('Behoud en verbetering van de fysieke FITheid bij neuromusculaire aandoeningen') training guideline. This guideline gives rehabilitation specialists, physical therapists, and other healthcare professionals support in the prescription and evaluation of individualized aerobic training in slowly progressive NMD, by providing a systematic approach with practical instructions and useful tools. In individuals with NMD, symptoms of muscle weakness, fatigue and pain may lead to reduced physical activity, causing deconditioning. Although an increasing number of studies in slowly progressive NMD has demonstrated positive effects of aerobic exercise on physical fitness, overall evidence is inconclusive. Therefore it remains unclear what the most optimal individual training approach for patients is, hampering the application of aerobic exercise in clinical practice. A survey of 40 rehabilitation specialists and physical therapists confirmed this assumption. Therefore we developed the B-FIT training guideline.[1] The guidelines is based on the results of a recent RCT (FACTS-2-NMD), experiences of patients and care professionals, and scientific literature. B-FIT was recently successfully applied in a pilot study including 20 patients with 10 different slowly progressive NMD, demonstrating its potential for clinical practice.
[1]https://www.amc.nl/web/AMC-website/Trainingswijzer-Spierziekten/Home.htm

Chair: Fieke Koopman, Rehabilitation specialist, researcher (NL)
Speakers: Eric Voorn, Researcher (NL), Merel Brehm, Researcher (NL), Marie-Jose van der Putten, Physiotherapist (NL)

Programme

1. The art and science of aerobic exercise training in NMD – *Fieke Koopman, Rehebilitation specialists, researcher (NL)*
2. Development of the B-FIT training guideline –*Merel Brehm, Researcher (NL)*
3. How to work according to the B-FIT training guideline – *Eric Voorn, Researcher (NL)*
4. The use of B-FIT in clinical practice: results of a pilot – *Marie-Jose van der Putten, Physiotherapist (NL)*

Parallel Session 4 – Debate and PhD Thesis Session

Friday 10 November, 10.45-11.45

4a. PhD thesis session
4b. Debate: Moving ahead towards participation?

4a. PhD thesis session

Presentations of the best PhD theses in the Netherlands: nominees of the PhD Award Rehabilitation Medicine

Chair: prof. Jeanine Verbunt MD PhD

During this session, the best PhD theses in the field of rehabilitation medicine in the academic year 2016-2017 of the NSRM, BNF-PRM and RBSPRM are presented. These dissertations are nominated by professors in rehabilitation medicine. A selection of the theses was made by the PhD Award jury. During the session the jury will select the winner from the nominees of the PhD Award Rehabilitation Medicine 2017.

Programme

Three lectures of the nominees of PhD Award Rehabilitation Medicine

- Guna Berzina MD PhD - Comparison of Rehabilitation Outcomes for Persons After Stroke in Latvia and Sweden
- Nicole Voet MD PhD - Aerobic exercise and cognitive behavioral therapy in FSHD: a model based approach
- Thibault Warlop MD PhD - Can long-range autocorrelations be a clinical tool for assessing dynamic stability?

Comparison of Rehabilitation Outcomes for Persons After Stroke in Latvia and Sweden

Guna Berzina MD PhD

The aim of the thesis was to explore the determinants of rehabilitation outcomes for persons after stroke and compare them between those who lives in Latvia and Sweden, using the bio-psycho-social model suggested by the World Health Organisation. In this study, in-patient rehabilitation systems, as well as level of functional independence at discharge from rehabilitation after stroke in Latvia and Sweden has been compared. The impact of functional limitations in the post-acute phase of stroke (at the time of inpatient rehabilitation) for persons living Latvia and personal factors for persons living in Latvia and Sweden on self-perceived level of disability in the late phase of stroke was also investigated. The results of this thesis shows that different aspects influence rehabilitation outcomes for persons after stroke and results depends on the country of residence (Latvia or Sweden). Functional, organizational, social and personal factors are of importance. Some of the factors are modifiable by the healthcare system, but some are the responsibility of society as a whole.

Aerobic exercise and cognitive behavioral therapy in FSHD: a model based approach

Nicole Voet MD PhD

More than 60% of patients with facioscapulohumeral muscular dystrophy (FSHD) experience severe chronic fatigue. One would expect that being active leads to a higher level of fatigue. The opposite is true. In a model-based randomized clinical trial, 57 patients with FSHD and severe fatigue were randomized to 16 weeks of CBT, aerobic exercise (AET) or usual care. After 16 weeks of AET or CBT, the level of experienced fatigued decreased and the level of physical activity increased significantly. After CBT, patients experienced an increase in sleep quality and social participation too. The benefits of both interventions extended to the 12-week follow-up period, probably due to the fact that more than 70% of the participants continued their adjusted level of activity. MRI measurements of the upper leg muscles were collected before and after the intervention period. The progression of fatty replacement of muscle tissue was significantly lowered by both interventions. What proved to be impossible in drug trials up to now did succeed in research using rehabilitation interventions. AET as well as CBT did not only reduce the degree of disease burden, but also established a beneficial effect at the muscular level probably as a result of increased physical activity.

Can long-range autocorrelations be a clinical tool for assessing dynamic stability?

Thibault Warlop MD PhD

Human movement is intrinsically dynamic and complex. Continuous integration of multiple sensory inputs and coordination of motor outputs are needed to achieve efficient, stable and adaptable locomotion. Human movement variability stems inherently from such multiple interrelated loops. Increasing number of studies has indeed shown that human movement variability is not simply the signature of random noise but contains hidden temporal organization (assessed by long-range autocorrelations; LRA). Both externally (e.g. environment) and/or internally (e.g. pathology) generated perturbations and the neuromechanical responses to them contribute to the fluctuating dynamics of human gait. Although the origin of this property is largely debated, LRA may provide important information about neuromechanical control of gait and potentially constitute a powerful marker of dysfunction. Influence of external and internal factors on human locomotion was investigated, which allowed further investigation on both possible neuromechanical origin of LRA and their potential clinical utility. The recent consideration of LRA gives rise to new way of thinking about variability, adaptability, health and motor rehabilitation.

Lecture of the winner of the European Academy of Rehabilitation Medicine Prize 2016

Chair: prof. Guy Vanderstraeten MD PhD and prof. Joao Pinheiro MD PhD

Mental practice through motor imagery in neurorehabilitation

Kristine Oostra, Ghent University, Belgium

With this study project, we investigated the potential benefits of **Mental Practice** (MP) in neurorehabilitation. During mental practice (MP) with motor imagery (MI) a motor task is repeatedly mentally rehearsed without any overt movement. Patients with an acquired brain injury show a (partially) preserved **Mental practice through motor imagery in neurorehabilitation** MI ability and thus are potential candidates for MP. Moreover, MI vividness responded well to **MI training** with a normalization of kinesthetic motor imagery vividness scores in patients after stroke. Our study results further support the evidence that MP has an additional benefit in **gait rehabilitation** poststroke. Even people with initially low MI ability scores seemed to benefit from MP.

Finally, using **voxel lesion-symptom mapping**, we found that lesions in the left hemisphere were related to poor imagery ability. Voxel-lesion symptom mapping results identified the importance of an intact fronto-parietal network and basal ganglia for a preserved MI ability.

4b. Debate: Moving ahead towards participation? *The future of rehabilitation medicine*

Moving ahead towards participation…. Should we, as medical specialists, focus more on participation than on impairments? Focus more on community based rehabilitation than on intra-articular injections? Become a managerial doctor instead of a technical doctor? These are important questions for the future development of our profession. During this session representatives from the three societies will lively debate with the public on this existential topic.

A fierce debate will take place between three prominent rehabilitations physicians:

- **Gunnilla Brodda Janssen - BNF-PRM**
- **Koen Peers MD PhD - RBSPRM**
- **Leonie de Ruijter MD - NSRM/VRA**

The discussion will be headed by a professional debate leader: Hans Oosterkamp. The audience is expected to participate in the discussion.

Hans Oosterkamp

Hans Oosterkamp studied law at the Free University of Amsterdam and graduated in 1991. After that, he got involved in policymaking for the long-term care for disabled people. Since 2000 Hans' main profession is strategy-consultancy in the long term care in the Netherlands. He has been working for PricewaterhouseCoopers in assignments for the Ministry of Healthcare, umbrella-organisations and healthcare providers for the elderly and the handicapped. Since 2009 he is working for BMC, which is mainly focussed on the non-profit sector. His most recent experience is with healtinsurancecompanies and general practicioners.

In his regular work Hans usually leads the debate that comes with strategic analysis and strategic decision making. This led to the situation that clients and other people from his network invite Hans to be their debate leader or chairman for seminars and congresses. This role is what Hans calls his main side-activity.

Gunilla Brodda Jansen MD PhD

Gunilla Brodda Janssen MD PhD, specialist in Rehabilitation Medicine and Pain Management. Ass Professor at Karolinska Institutet. Medical director at PBM Sweden. Scientific secretary of the Swedish Society of Rehabilitation Medicine. Board member of the Foundation for the Nordic Prize in Medicine. Board member of the BNF-RM Baltic and Nordic Sea Forum on Physical and Rehabilitation Medicine. Organizer of workshops nationally and internationally with ICF focus. Major research and clinical focus is multimodal pain management with a focus on phychiatric and psychological co-morbidity.

Koen Peers MD PhD

Koen Peers, MD PhD is head of department Physical & Rehabilitation Medicine (PRM) at the University Hospitals Leuven (UZ Leuven) in Belgium. After obtaining a medical degree at KU Leuven in 1992, he got a special degree in Sports Medicine in 1995 and he further specialised in PRM at the Leuven University, he got his degree in 1999. He started working at the PRM department of UZ Leuven in 1999 and is currently leading the department Physical & Rehabilitation Medicine (PRM) at the University Hospitals Leuven and head of Sports Medical Advice Centre KU Leuven. Furthermore he is program director Sports Medicine KU Leuven and vice-president of the Royal Belgian Society of Physical and Rehabilitation Medicine (RBSPRM) and board member International Scientific Tendon Symposium. His field of expertise is in the musculoskeletal rehabilitation. He published numerous scientific articles in national and international journals and national and international presentations. He is currently promoting more than 30 master theses per year and 6 PhD projects.

Leonie de Ruijter MD

Leonie de Ruijter, MD, has just started her career as a rehabilitation specialist focusing on pediatric rehabilitation at Heliomare Rehabilitation Centre, Wijk aan Zee. During her residency (Academic Medical Centre, Amsterdam) she was a member of the residents committee (representing the residents in the NSRM) and Education Committee of the NSRM. To individualize her training she accomplished part of her residency focusing on management and organization of healthcare at Tolbrug Rehabilitation Centre, 's Hertogenbosch and completed an extra-curricular training program provided by the Academy for Medical Specialists regarding leadership and organization.

Parallel Session 5 – Mini-symposia and workshops

Friday 10 November, 13.30-15.00

Parallel Session 5: Workshops and mini-symposia

5A. RaceRunning, the new way to (sport) participation
5B. Long-term care for adults with neurodisability: State of the art in Cerebral Palsy and Spinal Cord Injury
5C. First hands on tDCS (transcranial direct current stimulation)
5D. Cognitive rehabilitation: a multidisciplinary approach
5E. Cochrane Rehabilitation or how to bring evidence to clinical rehabilitation practice.
5F. Does it matter what patients and health care practitioners think about low back pain?
5G. Outcome measurement in Physical and Rehabilitation Medicine: Current standards and recent developments
5H. How do you feel today, doctor?
5I. Community and participation: the challenges of the 21st century in Europe
5J. Health literacy in daily practice. Teach the teacher course: Low health literacy - how to recognize and to supervise?
5K. The Dilemma Game: an educational tool

5A Mini-symposium RaceRunning, the new way to (sport) participation

In this mini-symposium, the way RaceRunning can increase participation of persons with a disability will be presented and discussed. A racerunner, a tricycle that is propelled by stepping on the ground, was first introduced in the Netherlands in 2012. Since then, many (pediatric) rehabilitation centers have bought racerunners, especially for the pediatric population. They use racerunners in order to improve physical fitness of children and adolescents with all kind of diagnoses, who are unable to walk or run by them and mostly use a wheelchair for mobility. Moreover, 13 athletic sport clubs in the Netherlands have RaceRunning groups and this number is still increasing. Many young RaceRunning athletes also participate in running events. Now is the time to pay more attention to the use of a racerunner for adults in rehabilitation, like patients with TBI or stroke. In this mini-symposium the presenters will discuss what a racerunner is, the state of the art of RaceRunning in the Netherlands, and how to promote the use of a racerunner as a means to improve physical fitness and reduce sedentary time in wheelchair dependent persons. The results of different research projects will be presented in an interactive way.

Chair: Petra van Schie, Pediatric physical therapist and researcher (NL)

Speakers: Eline Bolster, pediatric physical therapist and researcher (NL), Marianne Assscheman, human movement scientist (NL), *Arnoud Edelman Bos, human movement scientist (NL), Maud Schoenmakers, physical therapist (NL)*

Programme

1. What is RaceRunning – *Petra van Schie, pediatric physical therapist and researcher (NL)*
2. Reliability of the 6 minutes RaceRunning test – *Eline Bolster, pediatric physical therapist and researcher (NL)*
3. Maximal tests by athletes with Cerebral Palsy during RaceRunning – Marianne Assscheman, human movement scientist(NL)
4. RaceRunning as a para-athletic sport – *Arnoud Edelman Bos, human movement scientist (NL)*
5. Psycho-social effects of RaceRunning – *Maud Schoenmakers, physical therapist (NL)*
6. Questions and discussion (try out of a Racerunner)

5B. Mini-symposium Long-term care for adults with neurodisability: State of the art in Cerebral Palsy and Spinal Cord Injury

A mini-symposium to define the challenges of treating and preventing secondary musculoskeletal and neurological conditions in the growing populations of adults with cerebral palsy (CP) or long-term spinal cord injury (SCI). CP and SCI have always been considered static conditions in the neurological sense. Secondary and associated conditions that occur in persons with CP or SCI can progress over time and cause unwanted sequelae. This mini-symposium discusses several conditions that present across the lifespan and can lead to progressive loss of function in persons with CP or SCI. These conditions may be lessened, or even prevented, with timely intervention and diagnosis. We will discuss possible interventions and outcomes over time in the context of multidisciplinary treatment. Also, we will focus on the importance of disability-management and self-efficacy for better health and higher levels of participation and life satisfaction in long-term CP or SCI.

Chair: Marij Roebroeck, Associate professor (NL)

Speakers: Jacinthe Adriaansen, Resident PMR (NL), Sander Hilberink, Senior researcher (NL), Wilma van der Slot, Physiatrist/ senior researcher (NL), Martijn Klem, patient organization BOSK, Dorien Spijkerman, Rehabilitation Physician

Programme

1. Lessons learned from studies in adults with CP – *Marij Roebroeck, Associate professor (NL)*
2. Secondary helath condiions in long-em spinal cord inury. Recommendations for follow-up – *Jacinthe Adriaansen, Resident PMR (NL)*
3. Health and participation problems in older adults wihlong-term disabiliy; Unmet needs – *Sander Hilberink, Senior researcher (NL)*
4. Follow-up and interventions for adults with CP – *Wilma van der Slot, Physiatrist/ senior researcher (NL)*
5. Discussion panel: The importance and organizational challenges for preventive care and access to specialized health services for persons with long-term neurodisability – *Martijn Klem, patient organization BOSK, Dorien Spijkerman, Rehabilitation Physician, Jacinthe Adriaansen, Sander Hilberink, Wilma van der Slot*

5C. Workshop First hands on tDCS (transcranial direct current stimulation)

Neuromodulation, i.e. the possibility to purposely modulate neural activity, is an appealing topic in the field of neurorehabilitation. Non-invasive brain stimulation offers the fascinating perspective to stimulate target brain

areas/networks in order to enhance/diminish their activity, which could potentially improve the impact of rehabilitation therapies. Transcranial direct current stimulation (tDCS) is the most user-friendly, safe, and easy-to-setup non-invasive brain stimulation method that has been studied during the last decade. Several scientific studies and clinical trials have demonstrated that tDCS could potentially become a useful add-on therapy in neurorehabilitation, although the bench-to-beside translation process is still long and rocky. After a short general introduction about tDCS (principles, safety …), this hands-on workshop will focus on the practical use of tDCS by providing to the participants the opportunity to manipulate tDCS devices on each other's.

Objectives:

- To provide the information about the general principles of tDCS (transcranial direct current stimulation), its safety of use, and a quick overview on its potential applications
- To provide to the participants the opportunity manipulating tDCS devices on each other's: placing the electrodes, connecting the devices, setting up the stimulation parameters, stimulating briefly (3 hands-on sessions of 25 min each)
- To provide to the participants the opportunity experiencing the cutaneous feeling during tDCS.

Chair: Yves Vandermeeren, Neurologist (BE)
Speakers: Ruud Selles (NL), Zeb Jonker (NL), Kerstin Spielmann (NL), Mieke van de Sandt (NL)

Programme
1. tDCS quick-off – *Yves Vandermeeren, neurologist (BE)*
2. tDCS targeting the primary motor cortex (M1) – *Yves Vandermeeren*
3. tDCS targeting the cerebellum – *Ruud Selles (NL), Zeb Jonker (NL), Joris van der Cruijsen (NL), Mieke van de Sandt-Koenderman (NL)*

Max. 21 participants

5D. Mini-symposium: Cognitive rehabilitation: a multidisciplinary approach

Several studies of specific interventions for cognitive deficits have been proven to be effective. Here, we will address diagnostic and therapeutic implementations regarding neglect and apraxia. Prism adaptation is a therapeutic tool for unilateral neglect. The study presented aims to investigate the effect of an extended treatment procedure using a wide range of 'ecological' visuo-motor tasks. The results of the treatment protocol and the rationale behind it will be discussed. In the second part, a test battery for the diagnosis of apraxia will be presented. Research has shown that apraxia significantly interferes with activities of daily living. We used a custom-build test battery in 63 brain injured patients to evaluate sensory, descriptive, and procedural knowledge of tool use. The study shows that brain injured patients in general show deficits on tasks that probe tool-related knowledge. We will critically review the results of therapeutic reports to alleviate apraxia, and provide guidelines for rehabilitation. Finally, we will discuss the treatment option of mental practice through motor imagery in patients with an acquired brain injury. The impact of the brain lesion on motor imagery ability will be reviewed and evidence regarding the use of motor imagery in this patient group will be presented.

Chair: Kristine Oostra, Medical doctor Physical and rehabilitation Medicine (BE)

Speakers: Guy Vingerhoets, Full professor (BE), Engelien Lannoo, Neuropsychologist (BE)

Programme

1. Detection and rehabilitation of apraxia – *Guy Vingerhoets, Full professor (BE)*
2. Ecological prism adaptation in the rehabilitation of unilateral neglect – *Engelien Lannoo, Neuropsychologist (BE)*
3. Mental Practice through motor imagery after acquired brain injury – *Kristine Oostra, medical doctor Physical and rehabilitation Medicine (BE)*

5E. Mini-symposium: Cochrane Rehabilitation or how to bring evidence to clinical rehabilitation practice

Cochrane is an independent, non-profit organisation that provides the most robust, trustworthy systematic reviews of research evidence designed to guide clinical decision making. Cochrane Rehabilitation is aimed to ensure that all rehabilitation professionals can apply Evidence Based Clinical Practice, combining the best available evidence as gathered by high quality Cochrane systematic reviews, with their own clinical expertise and the values of patients. The aim of this symposium is to provide clinicians with contemporary perspectives on the science of evidence-based practice, and the role that Cochrane should have in their clinical work. First an overview of the organisation, goals and plans of Cochrane Rehabilitation will be presented. The second presentation will outline when and how to use observational effectiveness studies and benchmarking controlled trials for assessment of clinical or health care system impacts. The third presentation will deal with specific challenges to generating evidence in rehabilitation that relate to the idea of evaluation of complex interventions, the need for multidimensional and individual functional outcomes, and the challenges of a multiprofessional interdisciplinary team-approach. Finally, suggestions will be given on how to identify and choose the relevant evidence and effectively change PRM clinical practice accordingly.

Chair: Guy Vanderstraeten, medical doctor physical and rehabilitation medicine (BE)

Speakers: Carlotte Kiekens, medical doctor physical en rehabilitation medicine (BE), Antti Malmivaara, medical doctor physical and rehabilitation medicine (FIN), Thorsten Meyer, Psychologist (DE), Stefano Negrini, medical doctor physical and rehabilitation medicine (IT)

Programme

1. Cochrane Rehabilitation – *Carlotte Kiekens, medical doctor physical en rehabilitation medicine (BE)*
2. Benchmarking Controlled Trial-a novel concept covering all observational effectiveness studies – *Antti Malmivaara, medical doctor physical and rehabilitation medicine (FIN)*
3. Generating evidence in rehabilitation: specific challenges and possible answers – *Thorsten Meyer, Psychologist (DE)*
4. From evidence to everyday clinical PRM practice – *Stefano Negrini, medical doctor physical and rehabilitation medicine (IT)*

5F. Mini-symposium: Does it matter what patients and health care practitioners think about low back pain?

Low Back Pain (LBP) is the most common musculoskeletal reason to consult a health care practitioner (HCP). A study evaluating years lived with disability as measure of disease burden reported that LBP was ranked highest. LBP therefore remains a major health problem and a socio- economic burden. After several decades during which patients with LBP were intensively studied, the time has come to have a closer look at the HCPs. Despite the plethora of evidence-based guidelines for LBP, surveys reveal that many HCPs do not adhere to these guidelines. In the present mini-symposium we will highlight the importance of assessing patients' beliefs about LBP, as it is a major prognostic

factor. In addition, we will discuss the importance of self-reflection of HCPs. Especially HCPs with a biomedical treatment orientation or higher fear-avoidance beliefs wrongly advice their patients to restrict work or activities or believe that medical imaging is useful in the case of non-specific LBP. Yet, the importance of an early return to work is widely accepted and inappropriate imaging might result in findings that are irrelevant for the HCP and alarming for the patient. Finally, we will discuss barriers to the implementation of LBP guidelines.

Chair: Anne Berquin, Assistant Professor, Coordination of pain clinic of the University Hospital St Luc (BE)

Speakers: Christophe Demoulin, Post-doctoral researcher and physiotherapist (BE), Marijke Leysen, Doctoral researcher (BE), Nathalie Roussel, Assistant Professor and physiotherapist (BE)istant Professor, Coordination of pain clinic of the University Hospital St Luc (BE

Programme

1. Does it matter what patients and health care practitioners think about low back pain? – Anne Berquin, Assistant Professor, Coordination of pain clinic of the University Hospital St Luc (BE)
2. Attitudes & Beliefs of patients : Why are they so important? – Christophe Demoulin, Post-doctoral researcher and physiotherapist (BE)
3. Attitudes & Beliefs of health care practitioners : Why are they so important? – Marijke Leysen, Doctoral researcher (BE)
4. How to overcome barriers to implementation of evidence-based guidelines in health care practitioners managing low back pain – Nathalie Roussel, Assistant Professor and physiotherapist (BE)

5G. Mini-symposium: Outcome measurement in Physical and Rehabilitation Medicine: Current standards and recent developments

Standardized measurement tools of functioning and quality of life, including patient-reported outcome measures (PROMs), are increasingly considered relevant and important sources of information for outcome measurement in physical and rehabilitation medicine (PRM). The science associated with outcome measurement has developed rapidly over the last decade, resulting in new, improved standards for scale development and analytical practice. This symposium will review current standards and practice as well as novel methods for using outcome measures, and show how they can be implemented through the latest scientific applications, and provide an example of how this can contribute to clinical practice. First presentation will discuss current basic standards for using assessments and outcome measures. Second talk will include a short introduction to the Rasch measurement model, why it is important for measuring outcome, what it adds to classical approaches with examples of applications (including computer-adaptive test) made since its introduction. Then the third presentation will review the use of PROMs in various fields of PRM and discuss the PROs and CONs of their application in clinical practice. Final talk will present a novel approach in outcome measurement which enables the development of standardized reporting of outcomes by establishing a common metric of existing PROMs.

Chair: Ayşe A. Küçükdeveci, Medical doctor (TUR)

Speakers: Alan Tennant (CHE), Sehim Kutlay, medical doctor (TUR), Birgit Prodinger, Occupational therapist (CHE)

Programme

1. Current principles and basic standards for assessment and outcome measurement in PRM – *Ayse Küçükdeveci, medical doctor (TUR)*
2. Making measurement: An update on Rasch analysis – *Alan Tennant (CHE)*

3. Challenges in using PROMs in PRM – *Sehim Kutlay, medical doctor (TUR)*
4. Harmonising existing outcome measures along the continuum of care – *Birgit Prodinger, Occupational therapist (CHE)*

5H. Mini-symposium: How do you feel today, doctor?

Doctors are mostly highly dedicated professionals who strive for best quality of care. Unfortunately, many report that they experience increased work-related stress, and experience problems with combining private (family) life and career. Next to this, there has been an increase in residents (AIOS) drop out of training (in rehabilitation and other specialisms). Some have doubts as to whether they will continue to work in the medical field. This is an alarming development, since much has been changed to protect residents, and residents are the young talents of our specialism. In 2016 the professional interests committee of the NSRM organized a mini-symposium around this topic. In 2017 professional interests committee will join forces with the educational committee and residents committee of the NSRM to deepen this topic. During this interactive mini-symposium we will zoom in on: reasons why residents are dropping-out of our residency programme; facts & figures of work-related stress and problems with combining private life and career, burn-out and the reasons why these topics occur. Afterwards we will provide tools how to deal with work-related stress and work-private life balance for residents and rehabilitation physicians and how to discuss this within your medical staff. Lastly, the participants will be divided into groups, each group being asked to write an action plan to tackle the problems within their region/organisation.

Programma

1. Introduction – *Inez van der Ham*
2. Causes of drop-out residency programmes – *Lennart Rem*
3. Results new questionnaire about causes of stress, burn-out, drop-out etc. – *Wim Janssen*
4. Group sessions (per region): each group must create an action plan to tackle the problems
5. Tools to deal with work-related stress, work-private life balance for residents and rehabilitation physicians – sharing best practices – *Natasja Schijf*
6. Exchange of feedback in plenary session

Max. 80 participants

On behalf of the professional interests committee, educational committee and residents committee of the Netherlands Society of Rehabilitation Medicine

5I. Mini-symposium: Community and participation: the challenges of the 21st century in Europe

The symposium presents the theme of participation in the following dimensions:

- Ambient intelligence technology: How to promote independent living?
- Participation as a domain of the active and healthy ageing
- Amputees Rehabilitation: how may we increase Participation?
- The importance of the caregiver to improve post-stroke recovery - promoting patient's participation

Chair: João Pinheiro, medical doctor (PRT)
Speakers: Anabela Martins, physical therapist (PRT), Pedro Cantista, medical doctor (PRT), João Branco, medical doctor (PRT)

Programme

1. ***Ambient intelligence technology: How to promote independent living? – João Pinheiro, medical doctor (PRT)***

The implementation of technologies end environmental interventions can contribute to the independent living in specific populations, particularly geriatric or with restricted mobility. Home modifications and assistive devices are decisive elements for maintaining the functionality and health promotion. Issues related to cost-effective, user security access, the role of caregiver and ethical impact of interventions are structuring elements in the community intervention program.

2. ***Participation as a domain of the active and healthy ageing– Anabela Martins, physical therapist (PRT)***

Active ageing is defined as the process of optimizing opportunities for physical, social and mental health to enable older people to take an active part in society without discrimination and to enjoy an independent and good quality of life. The World Health Organization assumed this as a process for increasing and maintaining an individual's participation in activities to enhance his/her quality of life. What are the factors that better explain the participation? Moving ahead towards participation should guide professionals and services into new practical models. The authors will discuss strategies to maximizing functioning and movement potential with impact on participation, one of the domains of the Active Ageing Index, a new analytical tool to help policy makers in developing policies for active and healthy ageing.

3. ***Amputees Rehabilitation: how may we increase Participation? – Pedro Cantista, medical doctor (PRT)***

Participation is one of the three domains considered in the ICF Health Model. Increasing Participation is therefore a fundamental health benefit. We present, as an example of participation gain, the experience of our Amputee Unit by describing our methodology and clinical practice approach.

4. ***The importance of the caregiver to improve post-stroke recovery - promoting patient's participation – João Branco, medical doctor (PRT)***

After a stroke, patients often suffer from varying degrees of disability that require acute inpatient' treatment and extended care at home. The caregivers assume multiple responsibilities that can result in stress, particularly when their own needs are inadequately addressed during the patient's recovery. The rehabilitation field has long underscored the importance of a person's environment on his or her recovery, health status, and participation in daily life activities. Collaboration between health professionals and caregivers is required across the entire stroke pathway.
We identified the major problems and associated feelings experienced by family caregivers of stroke survivors during the first month after returning home. We will address the contribution of the rehabilitation team's work in improving the interaction between professional health and caregivers / family to promote patient participation.

5J. Workshop: Health literacy in daily practice

Teach the teacher course: Low health literacy - how to recognize and to supervise?

For a successful treatment outcome an active and participatory role of the patients is essential. Unfortunately many health professionals are unaware of the fact that almost one in two European citizens is affected considering the proportion of limited (insufficient or problematic) health literacy. Many patients do not possess the specific participatory competencies needed to manage their health. They lack reading skills or have limited perceived ability to access, understand, appraise and apply health information.

Why is it important? Does lack of participatory competencies of your patient influence the communication and understanding with your patient? Does it influence the learning strategy used by the members of your rehabilitation team? Does it influence the outcome of the rehabilitation? And how to supervise your resident in Health literacy? In this workshop the attendees will learn about the impact of low health literacy on health, how to recognize low health literacy and how to supervise.

Chair: Marga Tepper

Speakers: Marjan Mensinga, Jos Dekker, Fons van Dijk, Wim Otto and Karin Schepman

Programme

1. Introduction Health literacy: why is it important? – *Marga Tepper*
2. Health literacy: citizens with and without a migration backround – *Marjan Mensinga and Jos Dekker*
3. Recognition low health literacy in your patient and how to supervise your resident – *Fons van Dijk, Wim Otto and Karin Schepman*

   Max. 40 participants

5K. Mini-symposium: The Dilemma Game: an educational tool

Medical, ethical and moral dilemmas are common in all medical fields, including Physical and Rehabilitation Medicine. However, little attention is paid to these dilemmas in education of residents or in continuous medical education of specialists in PRM. The European Academy of Rehabilitation Medicine has taken the initiative to publish an exercise book that covers a range of clinical, educational and scientific dilemmas. In this workshop the background and practical use of the Dilemma game will be explained. Participants will be invited to play the Dilemma game and to give suggestions for further improvement. A free copy of the concept exercise book will be provided to all participants. Those who are able to contribute new dilemmas will be recognized as co-author in the final version that will be launched in Paris during the ISPRM congress in 2018.

Chair: Henk Stam, Head of Department Rehabilitation Medicine (NL)

Posters – index

Abstracts with odd numbers will be presented on Thursday. Abstracts with even numbers will be presented on Friday.

Poster presentations

1. The functional added value of a microprocessor-controlled knee joint for geriatric amputees: A pilot study

I. Telgenkamp[1], H.A.M. Seelen[2], J.A. Verbunt[1], B. Hemmen[3]

[1]Adelante Rehabilitation Center, Maastricht, the Netherlands
[2]Research School CAPHRI, Maastricht University, Maastricht, the Netherlands
[3]Maastricht University Medical Centre (MUMC+), Maastricht, the Netherlands

Introduction: An amputee's ability to walk safely and efficiently with a prosthesis is largely determined by the knee joint. A new microprocessor-controlled knee joint, 'KENEVO', is developed for geriatric amputees. It has multiple switchable modes, allowing for increased freedom of knee motion. However, the functional added-value of this knee joint regarding activity and participation levels in geriatric amputees has not been investigated systematically. **Research question:** To what extent does a leg prosthesis with a Kenevo knee joint, compared to amputees' present knee joint, improve the independence in everyday life activities of amputees with a limited activity level in and around the house? **Trial Design:** Ten participants will be randomized over two treatment sequences involving 7 measurement moments (T1-T7) over 28 weeks. All participants will start on their present regular prosthesis (baseline) (T1). After randomisation across either Kenevo or regular prosthesis, measurements will be taken at T2-T4. Subsequently, cross-over will take place, followed by measurements T5-T7. Physiotherapy intensity will be equal during both treatment sequences. Actual independence in everyday life activities is measured using the 'Assessment of Daily Activity Performance in Transfemoral amputee Test' (ADAPT). **Expected contribution to research and clinical practice:** This study will yield data needed for an ensuing larger (cost-)effectiveness study that will also assess the Kenevo's functional benefits for geriatric amputees. Such research results are also important given the increasing pressure from health insurers to provide firm scientific justification for choosing a particular (and possibly more expensive) microprocessor-controlled knee joint.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_359339_KtAKXMwx8K.png
Caption 1: A schematic overview of the Kenevo study design.

I. Telgenkamp - i.telgenkamp@adelante-zorggroep.nl

2. Falls in unilateral lower limb prosthetized amputees. Functional evaluation

G. Engenheiro[1], J.P. Pinheiro[2], A.J. Cordeiro[2], P. Pereira[2], S. Ramos[1]

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Introduction: Falls in amputees may be related to biomechanical features and psychological aspects. Portuguese research on falls in prosthetized lower limb amputees is still scarce. **Objectives:** Our aim is to assess the risk of falling in patients submitted to transfemoral and transtibial amputation, and assess the predictive value of functional tools. **Material and Methods:** An exploratory non-randomized study was developed using 52 patients aged between 30 and 80 years old, with an unilateral amputation at transfemoral or transtibial level and ^{3}12 months of prosthetization, with a FIM® ^{3}100. A form was completed with sociodemographic and anthropometric parameters, characterization of falls, the *Falls Efficacy Scale*(FES) functional scale and a 10 Meter Walk Test(10MWT). Descriptive and correlational analysis was conducted using IBM® SPSS Statistics version 23 for Windows®. **Results:** The mean age of the patients (81% males and 19% females) was 57.21±11.54 years old; 44% had a transfemoral and 56% a transtibial amputation. Trauma was the most frequent aetiology (63.5%). 19 amputees (36%) had fallen in the previous year (56% transfemoral and 20%

transtibial (p=0.025)). Transfemoral amputees presented a lower walking speed (p <0.001). No correlation was found between number of falls, FES or 10MWT. **Conclusion:** Transfemoral amputees fell more than those with transtibial amputations and presented a lower walking speed. The FES and 10MWT metric instruments did not prove to be good tools for predicting the risk of falls in amputees.

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3. Influence of a microprocessor-controlled prosthetic knee on responses to anteroposterior platform perturbations during walking: A randomized cross-over trial

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Introduction: The use of a microprocessor-controlled prosthetic knee (MPKs) is associated with a reduced fall risk in individuals with a transfemoral amputation. There is no biomechanical explanation available that explains this finding. A potential way to obtain this explanation is to study responses to balance perturbations during walking. **Objective:** To study the added value of a specific MPK, the Rheo Knee II, on responses to anteroposterior platform perturbations during walking. Patients Individuals with a transfemoral amputation or a knee disarticulation that were currently walking with a non-microprocessor-controlled prosthetic knee (NMPK). All participants were free of stump problems or other musculoskeletal problems that might influence walking ability. **Methods:** Participants were measured with their own NMPK and with the Rheo Knee II. Participants were walking on a treadmill wich was embedded in a platform. The platform was pulled backwards during the single stance phase and swing phase of the prosthetic leg. We calculated the backwards margin of stability (BMoS) which is a measure of dynamic gait stability. **Results:** The BMoS of the steps after the stance phase perturbations in the Rheo Knee II condition was significantly increased when compared to the NMPK condition. This is achieved by reducing foot-forward placement. **Discussion and conclusions:** The use of the Rheo Knee II led to an increased BMoS after the stance phase perturbations which is thought to be reflective of a decreased fall risk. **Clinical message:** The results of this study provides evidence that might explain the reduced fall risk associated with MPKs.

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4. Concurrent validity and reliability of a low-cost spatiotemporal gait analysis system

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Introduction: Objective measures of spatiotemporal gait characteristics can inform clinicians about gait deficits in various patient groups. However, few low-cost and easily applicable systems are available for clinical settings. **Objective:** To establish the concurrent validity of a low-cost spatiotemporal gait analysis system (SGAS). **Subjects:** Thirty-three healthy adults. **Methods:** The SGAS consists of a camera placed perpendicular to a walkway that is calibrated in the camera field-of-view using custom software that determines spatiotemporal outcomes. Subjects walked repeatedly barefoot across a 10-m walkway at comfortable walking speed and were simultaneously recorded with the SGAS and

with the GAITRite® system. Ten footsteps were collected for each subject. Intraclass correlation coefficients (ICCs) were calculated to compare both systems. In addition, standard error of measurement and Bland-Altman repeatability coefficients were calculated. **Results:** High ICCs (≥.96; 95% confidence interval lower bounds ≥.88) were found for step length, step time and stance time. Standard error of measurement and Bland-Altman repeatability coefficients were ≤2.0% and ≤5.1%, respectively. Four footsteps were required to reach an ICC above .9 and coefficient of variation below 10% for step length, step time and stance time. Double support time was invalid (ICC .21). **Discussion and conclusions:** Except for double support time, the SGAS showed to be a valid system for assessing spatiotemporal parameters during barefoot walking. Four trials are required to obtain reliable data with the system. **Clinical message:** The SGAS is a valid and reliable low-cost instrument to measure step length, step time and stance time for clinical purposes.

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5. Hand function in boys and men with Duchenne muscular dystrophy (DMD)

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Introduction: Life expectancy is increasing for persons with DMD. It is of importance to preserve hand function for activities of daily living as long as possible. Not much is known concerning the natural disease course of the hands, therefore developing interventions is as yet difficult. **Objective:** Explorative study, cross-sectional design, to examine the natural disease course of the hands in patients with DMD and to explore relations between the level of body functions/structures and the level of activities, according to the ICF model. **Patients:** N=51 boys/men (age range 5.2-40.0) with established diagnosis of DMD. **Methods:** Strength measures: MyoPinch and MyoGrip. Range of motion by goniometry. Activities: several instruments were used e.g. Brooke, PUL, MFM, 9-HPT, Timed-TIHM and all participants completed a questionnaire containing ABILHAND-plus and CUE. **Results;** The most obvious decrease of ROM with increasing age was seen in wrist supination, both right and left. Strength increased with age until the age of 10. A decrease was seen thereafter with a more rapid decline around 20 years. On the level of activities great variability was seen on the different tests; some boys around the age of 10 already experienced difficulties. Correlations were found i.a. between thumb mobility and activities. **Discussion and conclusions:** Large variation in hand function was seen. In some younger patients disabilities were already present. Limitations: this study was performed within clinical practice, thus some data are missing. **Clinical message:** It is important to pay attention to hand function in DMD. Further research is necessary.

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6. Psychosocial impact of assistive technologies for mobility and participation - implications for rehabilitation

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Introduction: The Classification of Functioning, Disability and Health (ICF) captures functioning as the result of the interaction between body and environment, measured through activity and participation. Recognizing that assistive technology (AT) play an important role in participation, the appropriate selection and training will impact on the psychosocial domains of quality of life as well as on participation. **Objective**: To study the impact of AT for mobility on the participation of their users. **Patients**: 96 community dwelling adults, AT users for mobility, aged 45-97, mean 67.02

+/- 14.24 years old, 56.3% female, who attended rehabilitation centers in the center of Portugal. **Method**: From June 2015 until February 2016, participants were interviewed using the Psychosocial Impact of Assistive Devices Scale (P-PIADS), the Activities and Participation Profile related to Mobility (APPM), as well as a questionnaire about demographics, clinical and AT. **Results**: The participants' profiles revealed moderate limitation and restrictions in participation, measured by the APPM (2.03). All subscales and P-PIADS total were positively correlated with the activities and participation profile. **Discussion and conclusions**: These results encourage the authors to keep studying the impact of AT for mobility on participation to develop robust evidence for rehabilitation, giving a contribution to the efforts of the Global Cooperation on Assistive Technology Initiative, and create support for Rehabilitation 2030 A Call for Action. **Clinical Message** : To build comprehensive rehabilitation services, information on a person's experience in every aspect of his/her life is essential, as well as the role of AT on functioning.

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7. Investigation of Person Centredness in Therapeutic Relationships: the Viewpoint of Stakeholders in Latvia

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Introduction: The concept of person centredness is an empowering approach to care that makes the patient central to the therapeutic relationship. However Dierck et al (2013) have identified barriers that interfere with the implementation of person centred approaches, i.e., lack of health care provider skills, patient unwillingness to participate, absence of shared decision making, and shared responsibility. **Objectives:** This study assessed person centred relationships between physiotherapists and their service users. The aim was to explore the experience of person-centredness of physiotherapists and their service users. **Methods:** Data was collected using The Helping Alliance Questionnaire (Luborsky et al., 1996) for physiotherapists (n=208) and service users (n=115). Semi-structured individual in-depth interviews were conducted with participants (n=6) – service users. **Results:** The service user group scored an average of 97.53 points (SD 10.96) of maximum 114, and the physiotherapist group 88.26 points (SD 7.3) suggesting close collaboration, however scores significantly differed in 16 questions out of 19 ($p<0.05$). Interviewees expressed similar views, partially covering aspects of person-centred practice and recognizing physiotherapists role and decision making power as key elements in therapeutic relationships. **Discussion and conclusions:** Other studies have shown differences in the perception of therapeutic relationships between physiotherapists and service users as well. In this research person centredness was incompletely perceived by both groups indicating an authoritative physiotherapist role which discourages service user autonomy regarding their health. **Clinical message:** This paper offers insight into the extent to which current therapeutic relationships within physiotherapy practice in Latvia is person-centred.

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8. Why the concept of participation as defined in the ICF is still difficult to use in clinical rehabilitation. A critical review of the literature

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Introduction: rehabilitation services are increasingly interested in regaining performance in daily life of their patients. Within the ICF this domain is referred to as participation. However the definition of this term, and specifically how it is then measured are still subject to uncertainty and debate. Participation is defined as 'involvement in a life situation' and has become a key concept in rehabilitation. However, researchers have raised a lot of questions regarding its conceptualization. **Objective and search strategy**: with a critical review of the literature between 1976 and 2017 we aimed to identify conceptual problems in applying participation in clinical practice. This review has to be considered as a stock-take of accumulated insights and started from literature in rehabilitation journals. Literature from adjacent research fields were added when relevant for the rationale of this review. **Results**: key-limitations and criticism regarding the ICF definition are summarized and are structured in three themes: (1) the genesis and the definition of the concept of participation, (2) recurring limitations of the definition and (3) the divergence with regard to its operationalization and measurement. **Conclusion**: notwithstanding an increasing body of knowledge some issues still remain blurred. This impedes research and reduces practitioners' effectiveness to use participation as an important concept in rehabilitation. A call to find common ground and agreement regarding the concept is indicated. Having knowledge of the current body of knowledge and the accompanying shortcomings can be useful for professionals aiming to implement or to use participation in clinical practice.

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9. The challenges of growing up with a physical disability: description of functioning using a systematic set of questionnaires

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Introduction: Aiming to support young adults with a physical disability in their transition from child to adult treatment modules were developed, covering subjects such as housing, finances, education and work, relationships. Although previous studies on specific patient groups have suggested difficulties in participation, knowledge on transition status and level of independency and participation is scarce. **Objective:** To determine whether young adults with chronic disabilities encounter difficulties in participation. Secondly, to detect differences among subgroups. **Methods:** A set of questionnaires was used to determine participation, self-efficacy and self-management in 51 young adults: Rotterdam Transition Profile (RTP), Utrecht Scale for Evaluation of Rehabilitation-Participation (USER-P), Questionnaire of Young People's Participation (QYPP), Partners in Health (PIH), General Self-efficacy Scale (GSES). Subgroups consisted of rehabilitation outpatients (n=18) and students at a school for disabled children (n=33). Descriptive data are presented. **Results:** The most important differences between subgroups were age and level of education. Between subgroups differences in participation, measured with the RTP, QYPP and USER-P, were found, especially on housing and home life, education and work and sexuality. The level of self-efficacy (GSES) was comparable to that of the general population. There appears to be a connection between age, level of education or transition stage and level of participation and independency. **Discussion and conclusions:** Young adults with a physical disability show disadvantages on several domains of participation and transition. **Clinical message:** The set of questionnaires can be used as an instrument to detect limitations in participation and helps to indicate for treatment modules.

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10. An overview of head support solutions for people with reduced or altered head mobility

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Objective: To create an overview of existing assistive devices for supporting the head of people with decreased or altered head mobility. Additionally, to investigate if there are any functionalities missing in the current head support solutions. **Search strategy:** A systematic literature review was performed, combined with searches in technology manufacturer databases and websites, to get an overview of existing head support solutions. Expert opinions were gathered, as well as feedback from a number of head support users by means of semi-structured interviews. **Selection of articles:** A database was constructed from the assistive devices that were found. **Evaluation of articles and results:** Devices were categorized with respect to type of interface with the user, functionality and amount of adjustability in the system. **Conclusion:** Existing solutions that stabilize the head are mainly static, meaning that the head can only be stabilized in one position. Some systems offer freedom of movement but do not really support the head. Additionally, some systems can be configured such that there is a certain level of adaptability to the user. However, if head support systems are adjustable, most often it are systems which enable the caregiver and/or end user to manually change the head support to another position. Based on feedback from experts and users there can be concluded that there is a need for assistive devices that provide independent adjustability in such a way that changes in position of the trunk and head are combined with continuous stabilization.

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11. Test-retest reliability and validity of the two-minute walk test on a self-paced treadmill

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Instrumented treadmill training in a virtual reality environment has been introduced for balance and gait training. It provides a motivational and safe training environment and allows for objective data collection. To evaluate training progression in clinical practice, short task specific treadmill tests are needed. Self-paced treadmills allows for more natural way of walking [Sloot,2014].The purpose of the study was to evaluate reliability and external validity of the two-minute walk test (2MWT) on a self-paced treadmill (GRAIL). Twenty-two healthy controls, 14 persons after stroke and 13 persons with an incomplete spinal cord injury performed a 2MWT overground and two 2MWTs on the GRAIL in self-paced mode (GRAIL1 and GRAIL2). Motion sensors were attached to the ankles to assess spatiotemporal parameters. ICCs and Bland-Altman analyses (repeatability coefficient, RC) were performed. Covered distance was significantly larger during overground compared to GRAIL1 for all groups. ICCs (overground-GRAIL1) were between .64 and .70; RCs were between 50.7m and 65.1m. For the controls covered distance was 6.7m larger during GRAIL2 compared to GRAIL1 (p=0.01). ICCs (GRAIL1-GRAIL2) were between .84 and .96; RCs were between 25.9m and 35.2m. Analysis of the spatiotemporal parameters is in progress. Based on the ICCs, external validity of the 2MWT on the GRAIL was moderate and reliability was good. Differences between the GRAIL 2MWTs were similar to those reported for 2MWTs overground [Bohannon,2015; Selman,2014]. Hence, 2MWTs on the GRAIL are useful for group evaluation purposes but cannot be interchanged with 2MWTs overground. At least 50m increase of an individual means improvement.

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12. Community-based rehabilitation program. Experience of a Portuguese physical and rehabilitation medicine department

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Introduction: Community-based rehabilitation (CBR) program comprises a multidisciplinary rehabilitation team and it aims to promote proximity rehabilitation care towards enhancing functionality and participation. This study aims to characterize the population of patients assisted by HCR program. **Methods:** An observational study of patients participating in the CBR program was carried out. Inclusion criteria were patients who integrated the CBR program in 2016. Individual clinical files and CBR program records were consulted. Functional independence measure(FIM) scale was applied. Descriptive statistical analysis was performed. **Results:** 76 patients were included in the HCR program -72±16 years old, 54% female. The home visit was requested from the outpatient Physical and Rehabilitation Medicine(PRM) appointments in 32%, 33% from Neurology inpatient ward, 6% from Neurosurgery and 6% from Vascular Surgery. The main diagnosis were stroke(22%), lower limb amputation(16%) and other neurological diseases(19%). The patients had a FIM average score of 72(sd±24). 85% of the patients initiated a HCR program. Architectural barriers were evaluated during the first visit and in 42% structural adaptations were advised, most frequently at the bathroom. The most commonly aiding products prescribed were wheelchairs, bath chairs, transfer boards and grab bars. **Conclusion:** The CBR program provides community rehabilitation care to ensure a better integration of the individual in their environment and to improve the role of caregivers. CBR programs may benefit both functional and vital levels, and therefore we suggest that more comprehensive clinical and financial studies be carried out in order to generalize their use.

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13. Risk of falling and participation in community-dwelling older adults: influence of hypertension and polypharmacy

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Introduction: Falls are frequent in the elderly, have high mortality and often lead to restrictions in participation. Identifying risk factors for falls is fundamental to develop prevention strategies. **Objectives:** Identify useful tests in determining falling risk in community-dwelling older adults and the influence of medication and hypertension in falls and participation. **Patients**: 108 individuals who attended a health care facility between October 2016-January 2017. **Methods:** Retrospective, observational study. Inclusion criteria: age 65-85, FIM ≥120 and TUG≤12s. Individuals with serious cognitive and motor impairment were excluded. A form was filled with sociodemographic data, daily medication and history of falls. Handgrip strength and blood pressure were also measured. Fear of falling was assessed using the Activities-specific Balance Confidence (ABC) scale. Participation was evaluated using the Activities and Participation Profile related to Mobility (APPM). **Results:** Mean age was 72,28±6,02, 19,4% fell in the previous year. Fallers were older, took more medication, had higher SBP, lower ABC and handgrip strength. ABC strongly correlated with APPM. Hypertension existed in 77,4% and did not influence occurrence of falls. Polypharmacy and antidepressants were associated with increased falls. **Discussion and Conclusions:** ABC was useful in assessing risk of falling. Lower balance confidence was associated with higher restrictions in participation. Hypertension did not increase risk of falling, unlike polypharmacy and

antidepressants. Participation was not influenced by medication or hypertension. **Clinical Message:** Recognising risk factors for falls in community-dwelling older adults is important to direct interventions, such as re-evaluating medication, to prevent restrictions in participation associated with fear of falling.

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14. The CARE4STROKE program: description of a complex rehabilitation intervention using the Template for Intervention Description and Replication (TIDieR) checklist

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Introduction: CARE4STROKE is a caregiver mediated exercise intervention with many interacting components. The description of complex rehabilitation interventions in stroke rehabilitation trials is often incomplete. **Objective:**To describe the content of the Care4Stroke intervention in detail using the Template for Intervention Description and Replication (TIDieR) checklist. **Methods:** TiDieR consists of 12 items to describe an intervention: brief name, why, what – materials and procedures, who, how, where, when and how much, tailoring, modifications, how well – planned and actual. **Results:** *CARE4STROKE* combines caregiver-mediated exercises with e-health support. *Why:* It is hypothesized to augment intensity of daily practice during inpatient stay, continuing after discharge to patient's own living environment and as such improve functional outcome and facilitate early supported discharge for patients with stroke. *What:* Patient and caregiver exercise together and are guided by a trained physiotherapist once a week, *who* provides them a *tailor-made* program based on video exercises that are available on a tablet computer. *How much:* CARE4STROKE is followed for 8 weeks, with a minimum of 5 times a week 30 minutes exercise and can be executed in any rehabilitation setting *(where).* A suitability screening session with a physiotherapist is part of the inclusion procedure. **Discussion and Conclusion:** The TIDieR checklist helps to describe systematically all elements of a complex rehabilitation intervention like CARE4STROKE. **Clinical message:** When describing a complex rehabilitation intervention, we like to recommend the use of a consensus-based template to allow replication, proper interpretation of effects, increase transparency and facilitate implementation in clinical practice.

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15. Robot-based movement analysis in subacute stroke rehabilitation: Updated preliminary analysis of an ongoing longitudinal study to demonstrate feasibility of evaluating loss of independent joint control in clinical practice

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Introduction: The number of treatment options for arm-hand function after stroke is large and increasing, especially through innovative technologies (e.g., robotics, applied gaming). To better inform clinicians regarding treatment choices for individual patients, structurally collecting objective, diagnostic information in the clinical setting is an important step.

Nowadays, robotic devices enable quick measurement of quantitative data. **Objective:** To demonstrate feasibility of evaluating loss of independent joint control (IJC) using robot-based metrics in an ongoing clinical administration. **Patients:** Consecutive subacute stroke patients. **Methods:** During 12 weeks after admission, patients performed 4 evaluation sessions, in which shoulder abduction strength and IJC were quantified using HapticMaster robot during isometric (iSA) and reaching (rSA; requiring selective control of shoulder and elbow simultaneously) tasks, along with Fugl-Meyer assessment (FM). **Results:** So far, of the 14 patients included, isometric data was collected in 13 and dynamic data in 10. Longitudinal data is available from 4 participants (2x 4 sessions, 2x ongoing). Drop-outs were related to start-up issues (4), occurrence of shoulder pain (2) and early discharge (2). At baseline, FM ranged from 25 to 66 (mean ±SD= 45.9 ±13.6). iSA (ρ=0.75) and rSA (ρ=0.87) correlated strongly with FM ($p \leq 0.003$). FM, iSA and rSA increased across 2-4 sessions in all 4 participants. **Discussion and conclusions:** Ongoing longitudinal robot-based data collection indicates feasibility and its outcomes suggest that IJC and FM share mutual concepts, implying validity. **Clinical message:** Longitudinal clinical administration of robot-based metrics seems feasible and gives increasing insight into improved IJC and its correlation with FM.

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16 .Personalized caregiver and patient support in rehabilitation for patients with acquired brain deficits: the CARE4BRAIN trial protocol

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Introduction: The detrimental effects of living with acquired brain injury (ABI) include loss of independence in everyday activities, depression, reduced self-efficacy, perceived health status and societal participation, affecting patients and caregivers. The transition from treatment in a rehabilitation setting to independent functioning at home is experienced as a significant hurdle by ABI patients and their families. **Research question:** CARE4BRAIN evaluates two innovative interventions aimed at optimizing the transition to independent functioning at home (i.e. personalized supported discharge) without increasing the need for professional care. Effectiveness is evaluated in terms of self-efficacy, family functioning, quality of life, participation and mood of both patient and caregiver. The CARE4patient trial (NTR5055) aims at improving independence of patients in (extended) ADL and mobility. The CARE4carer trial (NTR6197) aims at improving feelings of mastery and coping skills of the caregivers. **Trial design:** Both trials are multicenter assessor-blinded randomized controlled trials. CARE4patient investigates caregiver-mediated exercises, in which the caregiver acts as an exercise coach, supported by e-health services and a physiotherapist. CARE4carer investigates the effect of (personalized) psychoeducation and teaching of problem solving skills of the caregiver, supported by e-health services and a social worker. **Expected contribution to research and clinical practice:** Novel methods to increase the intensity of exercise therapy after ABI and aimed at well-being of caregivers are urgently needed, with minimal use of resources. To this end, the CARE4BRAIN interventions may be promising approaches to increase self-management. The knowledge and evidence produced will be relevant to all ABI-patients who require assistance from caregivers.

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17. Do external focus instructions benefit motor learning post-stroke? A randomized controlled trial.

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Introduction: Healthy adults show greater motor learning when they focus on movement effects (*externally*), rather than on movement execution (*internally*). Despite its growing popularity within stroke rehabilitation, it is unknown whether external focus instructions also enhance motor learning post-stroke. **Objective:** To compare the effectiveness of internal and external focus instructions for learning a balance task post-stroke. **Patients:** Sixty stroke patients admitted for inpatient rehabilitation. **Methods:** Patients were randomly allocated to an internal (N=29) or external (N=31) focus group. Both groups practiced to stabilize a balance board with an adjustable rotational stiffness, 3 times per week, for 3 weeks. Outcome measures included the threshold rotational stiffness at which patients could keep their balance, as well as single- and dual-task performance (i.e., sway in degrees) at the baseline threshold stiffness. Assessments were performed at baseline (T0), and after 1 (T1) and 3 weeks of practice (T2) by a blinded assessor. General estimating equations determined which group showed greatest improvements. **Results:** Threshold rotational stiffness decreased similarly for both groups (p=.72; Figure 1). A group by test interaction (p=.03) revealed that the external group initially showed greater reductions in single-task sway magnitude than the internal group at T1, but that both groups eventually demonstrated similar improvements at T2 (Figure 2). Finally, dual-task performance improved similarly for both groups (p=.21). **Discussion and Conclusions:** External focus instructions may initially benefit stroke patients' motor learning, but this benefit disappears with extended practice.**Clinical Message:** There is no clear benefit of external focus learning for patients with stroke.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img2_357353_Dfjpah0Ud8.png
Caption 1: Figure 2. Sway in single-task conditions (degrees ± SE) over time for both groups. Lower values indicate better performance.

Picture 2: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_357353_Dfjpah0Ud8.png
Caption 2: Figure 1. Threshold rotational stiffness (Nm/rad ± SE) over time for both groups. Lower values indicate better performance.

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18. The Dutch Neurotraumatology Quality Registry (Net-QuRe); study design and pilot phase

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This trial is approved by the medical ethical committee of Leiden University Medical Center. Registration number trial: NTR6003 **Introduction:** This study focuses on the chain of care for patients with moderate to severe traumatic brain injury (TBI) from hospital admission to specialized rehabilitation and thereafter. To evaluate quality of care, structure and process indicators will be registered at the patient and institutional level. Optimal surgical and rehabilitation strategies will be evaluated. **Research questions:** What is the effectiveness of a direct operative evacuation compared to an (initial) expectant strategy in acute subdural hematoma? Which factors determine discharge destination and what factors predict

long-term outcome? **Trial design:** Net-QuRe is a prospective observational multi-institutional cohort study. Approximately 1500 patients aged >15 years old with moderate to severe TBI will be recruited from several Dutch level-1 trauma centers. Patients will be followed for two years, with assessments during hospitalization, and 6, 12, and 24 months post-injury. Extra assessments are added in case of rehabilitation in a participating center. Outcome measures include several ICF domains. In the first phase of the study outcome measures were defined by rehabilitation professionals using Delphi rounds. We developed a Net-QuRe database in GemsTracker. To test and improve the data collection procedures, a pilot phase was performed in four trauma- and two rehabilitation centers, which resulted in two closed chains of care. **Expected contribution to research and clinical practice:** The ultimate aim is to identify best practices in the health care chain for patients with moderate and severe TBI.

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19. Transcranial direct current stimulation and neural reorganisation after aphasia treatment

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Introduction*:* Anodal transcranial Direct Current Stimulation (A-tDCS) over language-related brain regions in the left hemisphere (LH) is assumed to enhance treatment effects in post-stroke aphasia by facilitating function of perilesional LH areas. **Objectives***:* To investigate whether A-tDCS targeting the left Inferior Frontal Gyrus (L-IFG), applied during word-finding treatment, boosts activation in perilesional LH networks. **Patients***:* Thirteen patients with subacute post-stroke aphasia (< 3 months) were recruited from a randomised controlled trial investigating the effect of A-tDCS on aphasia recovery. **Methods***:* Before and after a 2-week word-finding treatment (10 sessions, 45') with either A-tDCS (1 mA, 20') or sham over the L-IFG, functional MRI data were obtained using an auditory story comprehension task and an overt naming task (post-treatment only). Lateralisation indices were computed to establish recruitment of the left versus right hemisphere for both language tasks. **Results***:* Patients' naming performance improved significantly after treatment. During the auditory story comprehension task, both pre- and post-treatment, their brain activation was left-lateralised or bilateral. There was a rightward shift in activation after treatment. During the naming task, post-treatment, their brain activation was predominantly bilateral or right-lateralised. **Discussion and conclusions***:* Our results support the view that language recovery after LH aphasic stroke is a dynamic process involving both left and right hemisphere language networks. After unblinding in April 2017, further analyses will be done to contrast our results for tDCS versus sham. **Clinical message**: The results of this study will contribute to the ongoing investigation of tDCS as adjunct to rehabilitation facilitating brain plasticity.

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20. Assessment of Falls in Highly Functional Hemiparetic Patients

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Introduction: Stroke is the world second leading cause of long-term disability and fall is common in these patients, leading to a worse prognosis. Little is known concerning fall history and predictive measures in highly functional hemiparetic populations. **Objective:** Study fall history in highly functional chronic stroke hemiparetic patients and assess Fall Efficacy Scale (FES) and 10 Meter Walk Test (10MWT) as fall related measures in this population.
Patients: Hemiparetic adults, from an outpatient consultation, with more than one year single stroke, ambulation capacity and Functional Independence Measure (FIM) higher than 110. **Methods:** FES and 10MWT were applied and participants' recall of falls in the previous year was collected. **Results:** Among the 33 patients aged 61.09±7.34 years and with mean FIM 121.88±3.81, 17 experienced at least one fall. Mean FES was 72.41±22.62 in the fallers group and 85.75±6.55 in the non-fallers. FES revealed a statistically significant correlation with fall occurrence (p=0.031) and with the number of falls (p=0.032, r=-0.520). 10MWT mean was 0.72±0.30 and 0.79±0.31 m/s in the fallers and non-fallers groups, respectively. No significant correlation was found between 10MWT and fall occurrence. **Discussion/conclusions:** The fallers group showed significant less FES scores, revealing that patients with less balance confidence and sense of their fall risk, fall more. High 10MWT speeds confirm high ambulation capacity of this population but failed to differentiate fallers and non-fallers. Our findings suggest balance confidence is a useful fall related measure in the studied population. **Clinical message:** FES is useful in highly functional chronic stroke patients.

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21. Preliminary results of the direct effect of a soft-robotic glove as assistive device on movement execution in stroke

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Introduction: Technological innovations have the potential to support functional performance of the hands in ADL after stroke, by assisting patients' own function. Therefore, a wearable soft-robotic glove is developed that could support grip strength of stroke survivors with diminished hand function. **Objective:** The aim of this ongoing study is to evaluate the system's usability, and compare movement execution without glove and with glove, with support on and off. **Participants:** So far, 5 chronic stroke survivors with self-reported diminished hand function participated in this study. **Methods:** Participants performed a pinch force task and the Action Research Arm Test (ARAT). Movement execution during a standardized reach-and-grasp-task was measured with a 3D motion analysis system. Additionally, usability was assessed using the System Usability Scale (SUS). **Results:** Median pinch grip strength was higher with glove (p=0.04). Task duration and time needed to grasp the object was negatively influenced by the glove. No differences in ARAT score and other movement execution parameters were found between the conditions. The average SUS score was promising (mean 68 ± SD 24.2) and aspects for improvement of the glove were formulated. **Discussion and conclusion:** A positive assistive effect on pinch strength was observed. Although clinical task performance did not improve, no detrimental influence was observed, except for a slight delay in movement time. The concept of the glove was well received by participants. **Clinical message:** Patients indicated the soft-robotic glove is promising as assistive device. Usability and performance issues were identified that need attention in the next development stage.

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22. The marvelling world of clinical research: problems related to measuring mild neglect

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Objective: Despite cognitive training, neglect has still an unfavorable impact on rehabilitation outcome. Aim of this pilot study was to develop a protocol and investigate its potential effectiveness of enriched proprioceptive stimulation of the left arm on visual neglect in right hemispheric stroke patients using robotics. **Methods:** Five patients were proprioceptively stimulated once in a standard way for 15 minutes, using a robotic device attached to the wrist, by eliciting small erratic movements. In the first version of the protocol one patient was tested on different days (pre-post tests), whereas in the second protocol four patients were tested on one day before, during, and immediately after the proprioceptive stimulation. Neglect outcome measures consisted of conventional pencil-and-paper tests, the Grey-scales test, the Baking-Tray-Task and a scanning task targeting extra-personal space. **Results:** Although mild neglect was clinically observed in four patients, formal test results did not corroborate these clinical findings during all measurement moments. Furthermore, high between-test variability was observed in the detection of neglect. No consistent pattern of change in neglect was observed that could be attributed to the proprioceptive stimulation. **Conclusion:** Results from the neglect tests in the protocols used, question the (psychometric) value of these tests in research and clinical practice regarding mild neglect. Assuming that neglect is a dynamic, time- & situation-dependent process, new tests should be developed that accommodate its variable nature. No conclusions can be drawn from our protocol about the potential effect of proprioceptive arm stimulation on reduction of neglect.

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23. Improvement of active movement and function in adults with chronic spastic paresis following repeated treatment with abobotulinumtoxinA (Dysport®)

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Introduction: Limited data exist on improvements of active limb movement and function following botulinum toxin treatment in chronic spastic paresis. **Objective:** We report the effect of repeat abobotulinumtoxinA injections (aboBoNT-A, Dysport) from two Phase-III multicenter open-label (OL) trials in adults with spasticity post-stroke/TBI; one in upper limb spasticity, one in lower limb spasticity. **Methods:** These are OL-extensions of double-blind studies in which adults received single aboBoNT-A injections (Gracies, Lancet Neurology 2015; Esquenazi, AAPM&R16). Subjects (18-78yrs) received aboBoNT-A (500-1500U) over a year (injections ≥12 weeks apart) in affected limb. Active movement assessed by active range of motion (X_A) against elbow, wrist and finger flexors or active ankle dorsiflexion. Active function assessed by Modified Frenchay Scale (MFS) (upper limb) or 10m-walking speed test (lower limb). Results for Cycle 4 Week 4 of OL-extensions are presented. **Results:** 81 subjects received 5 injections in UL; 139 subjects in LL. X_A improved in upper limb across cycles, with active finger extension (most frequently injected group) increasing by mean(SD): +38.0(53.4)°. Overall MFS increase was +0.40(0.75), an improvement more pronounced with 1500U (500U in shoulder muscles): +0.62(0.48) than 100U: +0.30(0.83), this may suggest the importance of shoulder muscle injections. Active ankle dorsiflexion

improved by +6.5(10.9)° with knee extended. Comfortable walking speed improved by +0.088(0.144) (25% mean increase from double-blind baseline). **Clinical Message:** Improvement in active movement and function in subjects with chronic upper or lower limb spasticity was observed following repeat injections of aboBoNT-A over a year.

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24. Duration of effect of abobotulinumtoxinA (Dysport®) in adult patients with upper limb spasticity (ULS) post-stroke or traumatic brain injury

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Introduction: Current botulinum toxin labeling indicates injections every 12 weeks but few studies have assessed treatment intervals after repeated injections. In a recent double-blind (DB) study followed by open-label (OL) extension, abobotulinumtoxinA (aboBoNT-A, Dysport) was efficacious and demonstrated favourable safety profile in adult patients with upper limb spasticity (ULS) after single and repeated injections (Gracies, Lancet Neurology 2015; Brashear, AAN16). **Objective**: This analysis focuses on retreatment intervals after repeated injections. **Methods**: Phase-III, international, multicentre, DB, single-treatment study of aboBoNT-A in adults with ULS, followed by long-term OL extension with maximum 4 additional treatment cycles over maximum 18 months. Retreatment was per investigator's clinical judgement and possible at Wk12,16,20,24. **Results**: Among subjects who received aboBoNT-A in DB study and were treated in Cycle 1 of OL extension, 37% were re-injected at Wk16 or later (Wk16: 17%, Wk20: 10%, Wk24 or later: 10%). Of subjects who received a second treatment cycle in OL, 35% were re-injected at Wk16 or later (Wk16: 20%, Wk20: 7%, Wk24 or later: 8%). Of subjects who received a third treatment cycle in OL, 24% were re-injected at Wk16 or later (Wk16: 19%, Wk20: 3%, Wk24 or later: 2%). **Conclusions**: Here, 24% to 37% of subjects did not require re-injection before Wk16 across multiple cycles. This long duration of clinical effect leads to longer intervals between injections, and thus may reduce burden associated with frequency of injections for patients and caregivers/families. **Clinical message**: These results highlight the needs for a tailored approach in treatment of patients with ULS.

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25. Neuroimaging and Blood Biomarkers in Functional Prognosis after Stroke

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Introduction: Stroke remains one of the leading causes of morbidity and mortality around the world and it is associated with an important long-term functional disability. Some neuroimaging resources and certain peripheral blood or

cerebrospinal fluid proteins can give important information about etiology, therapeutic approach, follow-up and functional prognosis in acute ischemic stroke patients. Predicting the functional prognosis during acute phase would allow more objective rehabilitation programs and better management of the available resources. The aim of this work is to review the potential role of acute phase neuroimaging and blood biomarkers as functional recovery predictors after ischemic stroke. **Material and methods**: Review of the literature published between 2005 and 2015, in English, using the terms "ischemic stroke","neuroimaging" e "blood biomarkers". **Results**: We included nine studies, based on abstract reading. **Discussion**: Computerized tomography, transcranial doppler ultrasound and diffuse magnetic resonance imaging show potential predictive value, based on the blood flow study and the evaluation of stroke's volume and localization, especially when combined with the National Institutes of Health Stroke Scale. Several biomarkers have been studied as diagnostic, risk stratification and prognostic tools, namely the S100 calcium binding protein B, C-reactive protein, matrix metalloproteinases and cerebral natriuretic peptide. **Conclusion**: Although some biomarkers and neuroimaging techniques have potential predictive value, none of the studies were able to support its use, alone or in association, as a clinically useful functionality predictor model. All the evaluated markers were considered insufficient to predict functional prognosis at three months, when applied in the first hours after stroke.

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26. Duration of effect of abobotulinumtoxinA (Dysport®) in adult patients with lower limb spasticity post-stroke or traumatic brain injury

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Introduction: Few studies have assessed treatment intervals during repeated injections of botulinum toxin. In a double-blind (DB), single-treatment study followed by a long-term open-label (OL) extension, abobotulinumtoxinA (aboBoNT-A, Dysport) was efficacious and did not generate unexpected safety findings (Esquenazi AAPM&R16). **Objective**: To report retreatment intervals for the lower limb in hemiparetic adults after repeated aboBoNT-A injections. **Methods**: Phase-III, international, multicentre, DB, single-treatment study of aboBoNT-A in hemiparetic lower limb, followed by long-term OL extension with maximum 4 additional treatment cycles over maximum 18 months. Retreatment was per investigator's clinical judgement and possible at Wk12,16,20,24. **Results**: Among subjects who received aboBoNT-A in DB study and were treated in Cycle 1 of OL extension, 20% were re-injected at W16 or later (10% at Wk16, 5% at Wk20, 5% at Wk24 or later). Subjects who received a second cycle of treatment in OL extension, 32% subjects were re-injected at Wk16 or later (17% at Wk16, 9% at Wk20, 7% at Wk24). Subjects who received a third cycle of treatment in OL extension, 15% subjects were re-injected at Wk16 or later. **Conclusions**: These data demonstrate the long duration of effect of aboBoNT-A in the spastic lower limb with 15-32% of subjects re-injected at Wk16 or later across repeated cycles. A long duration of effect leading to a longer interval between injections may reduce burden associated with frequency of injections for patients and their caregiver/families. **Clinical message**: These results highlight the need for a tailored approach in the treatment of the lower limb in hemiparesis.

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27. Kinematic effects of providing ankle-foot orthoses early after stroke: a randomized controlled trial

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Introduction*:*-- Regaining walking ability is an important goal in rehabilitation post-stroke. Compensatory movement-strategies like pelvic hiking and circumduction are reported to ensure sufficient foot-clearance. Ankle-foot orthoses (AFOs) are often prescribed to improve foot-clearance and may influence these strategies. However, research studying effects of AFO-provision early post-stroke is limited. **Objectives***:* 1) To study short-term kinematic effects of AFO-provision early post-stroke; 2) study whether timing of AFO-provision influenced these effects. **Patients***:* Unilateral hemiparetic patients maximal six weeks post-stroke with indication for AFO-use. **Methods***:* Subjects were randomly assigned to AFO-provision: early (at inclusion) or delayed (eight weeks later). Three-dimensional gait-analysis with and without AFO was performed within two weeks after AFO-provision. **Results***:* Twenty subjects (8 early, 12 delayed) were analyzed. Ankle dorsiflexion at initial contact, foot-off and during swing improved after AFO-provision (-3.6°- (7.3) vs 3.0° (3.9); 0.0° (7.4) vs 5.2° (3.7); -6.1° (7.8) vs 2.6° (3.5), respectively), all $p<0.001$. Knee (+2.3°) and hip flexion (+1.6°) increased at initial contact (both $p\leq0.001$), no effects at foot-off or swing were found. Hip abduction, pelvic tilt and obliquity were not affected by AFO-use. Furthermore, early or delayed AFO-provision did not affect results. **Discussion- and conclusions***:* Positive short-term effects of AFO-provision were found on ankle kinematics early post-stroke. Timing of AFO-provision did not influence short-term results. Whether long-term effects are present is subject for future studies. **Clinical message**: AFO-provision improved ankle kinematics, while compensatory strategies around hip and pelvis were not affected. The point in time at which AFOs were provided post-stroke did not affect results.

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28. Primary care networks in stroke care in the Netherlands

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Introduction: In the Netherlands local or regional primary care networks of health professionals for the management of stroke patients have been instituted, aiming to improve the quality and accessibility of care. **Objective:** To describe the structure and processes of primary care stroke networks and make recommendations on their optimal organization. **Methods:** Primary care stroke networks were identified, with information about their characteristics being gathered using online questionnaires among network coordinators, members (health professionals) and patients.**Results:** Nineteen stroke care networks were identified, varying regarding size (8-103 members) and composition (professions). Eighteen networks had membership entry criteria and 8 imposed a membership fee. Collaborations were reported with patients/patient associations (n=12); hospital and/or rehabilitation center (n=18); a case manager (n=8). Twelve networks used a standardized treatment program and/or measurements. Time and money were the most frequently mentioned obstacles for continuation whereas mutual trust, commitment and short communication lines the most common success factors. Twelve coordinators indicated a need for more uniformity regarding stroke networks' organization. 124 of 456 network members completing the questionnaire reported improved quality of care since their membership and 74 a need for more uniformity regarding organization of stroke networks nationally. **Discussion and conclusions:** There is large variation regarding the characteristics of local/regional primary care stroke networks in the Netherlands. Patients

questionnaire is still ongoing. An invitational conference is planned in June 2017. **Clinical message:** There is a need for more transparency and structure regarding regional primary care stroke networks in The Netherlands.

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29. Is oral feeding compatible with an unresponsive wakefulness syndrome?

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Introduction*:* Vegetative state/unresponsive wakefulness syndrome (VS/UWS) is defined by the presence of eye-opening and the absence of awareness and voluntary movement [1]. VS/UWS patients classically receive hydration and nutrition through an enteral feeding tube. **Methods***:* We retrospectively reviewed the clinical information of 65 VS/UWS patients (aged 45±12; range 16-85 years) evaluated at the CHU hospital of liege searching for mention of oral feeding. VS/UWS diagnosis was made after repeated behavioral assessments using the standardized coma recovery scale–revised (CRS-R, [2]) in association with complementary evaluations using neuroimaging techniques. **Results***:* Of the 65 VS/UWS patients, two could resume oral feeding (3%). One could achieve full oral feeding and the other had oral feeding in addition to gastrostomy. Neuroimaging evaluations showed in both patients a massive decrease in the spontaneous brain activity and its functional connectivity (functional magnetic resonance imaging), bilateral cerebral cortex hypometabolism and preserved metabolism in the brainstem and cerebellum (positron emission tomography). **Discussion–Conclusion–Clinical message***:* oral feeding is rare in VS/UWS patients (3% in our cohort). Based on neuroimaging results, this behaviour does not seem to be incompatible with the diagnosis of VS/UWS but the neuromecanistic root, which allows this behavior, still needs to be elucidate. This study also emphasizes the importance of assess and manage deglutition in patients with altered state of consciousness regardless of their level of consciousness. Tactile oro-facial stimulation, manual therapy and therapeutic feeding can be another "gateway" to interact with these patients and improve their quality of life.

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30. Screening for cognitive impairments in survivors of out-of-hospital cardiac arrest during their rehabilitation

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Introduction: Guidelines in the Netherlands recommend survivors of out-of-hospital cardiac arrest (OHCA) to follow cardiac rehabilitation and to be screened for cognitive impairments. This study assessed the uptake of these recommendations by cardiologists and rehabilitation specialists in the Netherlands, the content of the cognitive screening, the need for an integrated care pathway to provide cognitive rehabilitation when needed and possible barriers and facilitators to implement such care pathway. **Methods:** An internet-based survey was sent to cardiologists (n=74) and rehabilitation specialists (n=143) in rehabilitation centres and hospital-based rehabilitation departments (n=51) (between May-August 2015). The survey covered: uptake of cardiac rehabilitation program for OHCA patients, presence and content of cognitive screening, the perceived need for an integrated care pathway which offers cardiac and cognitive rehabilitation and expected barriers and facilitators to implement the care pathway. **Results:** Of the returned questionnaires (n=45) 64% provided cardiac rehabilitation and 39% prescribed cognitive screening for OHCA patients. 89% of the respondents underlined the need of an integrated care pathway aiming at lower relapse rate and meeting

patients' needs. Biggest obstacles for an integrated care pathway are poor cooperation between medical specialties and logistic barriers. **Discussion and conclusion:** Although recommended in (inter)national guidelines, the uptake of cognitive screening after OHCA is limited in the Netherlands. Involved specialists see an added value in the use of a cognitive screening for OHCA-survivors. **Clinical message:** Clear agreements, established in a care pathway, can provide a solution to implement cognitive screening to cognitive rehabilitation facilities.

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31. The Caregiver Mastery Scale: a valid instrument for partners of patients with acquired brain injury

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Introduction and objectives: Mastery may protect against the negative consequences of caregiving. The aim of this study was to determine the validity of the Caregiver Mastery Scale (CMS) for partners of patients with acquired brain injury. The objectives were to (1) investigate the score distributions of the CMS, (2) examine the internal consistency of the CMS, and (3) test the convergent validity of the CMS when used by partners of patients with acquired brain injury. **Design and subjects:** Cross-sectional validation study among 92 partners of patients with acquired brain injury discharged from inpatient rehabilitation. **Main measures:** *Outcome measure:* Caregiver Mastery Scale. *Reference measures:* Caregiver Strain Index, Hospital Anxiety and Depression Scale (HADS) and CarerQol. **Results:** The CMS has a normal distribution, with no floor or ceiling effects. Its internal consistency is acceptable (Cronbach`s alpha: 0.75). The convergent validity analyses confirmed our hypothesis that higher scores on the CMS correlate with less burden, lower levels of anxiety and depression and greater well-being. Furthermore, partners scoring high on the CMS mostly scored below the clinical cut-off scores on the Caregiver Strain Index, HADS anxiety subscale and HADS depression subscale, whereas partners scoring low on the CMS were more likely to score above the cut-off points. **Conclusion:** The Caregiver Mastery Scale is a valid instrument to assess the caregiver mastery of partners of patients with acquired brain injury.

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32. The SCORE-study: Practice variation in process and outcomes of stroke rehabilitation in two rehabilitation centers in the Netherlands

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Objective: Practice variation in rehabilitation may imply differences in quality of care. In the SCORE-study we aim to investigate differences between two Dutch rehabilitation centers (RCs) in process and outcomes of stroke rehabilitation. **Patients:** Stroke patients in clinical rehabilitation. **Methods:** Length of stay (LOS) and treatment hours (process) were derived from the RCs' administration. Outcomes were assessed by questionnaires upon admission, discharge, and 3 months after admission, including the Stroke Impact Scale (SIS) for communication, cognition and hand function, and the EQ5D for quality of life. Addionally, the nurse assessed mobility using the USER. Baseline characteristics were derived from the patient's medical file and the questionnaire. Differences in process were evaluated using regression analysis

adjusted for covariates. Outcomes were analysed within centers over time, using nonparametric tests. **Results:** 305 Patients participated in the study. The average age was 60.0 (SD 12.8) in RC1 and 61.3 (11.9) in RC2, and Barthel index was 14.2 (5.5) and 13.9 (5.2) respectively. The LOS appeared comparable (RC1: median 45.0, interquartile range [IQR] 31.0-67.0; RC2: median 43.0, IQR 30.0-62.0). There was variation in physiotherapy, movement therapy, speech therapy, psychology, and activities therapy hours, but differences were small. Mobility and hand functioning improved in both centers, and self-reported cognition and comunication decreased over time. Quality of life increased significantly in RC2 but not in RC1. **Conclusion:** Only small differences between centers were found in the process of rehabilitation, and trends in outcomes were comparable. **Clinical message:** There were no indications for variation in quality of care.

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33. How do patients and caregivers manage caregiver-mediated exercises during the CARE4STROKE trial?

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Introduction: In the Care4Stroke study, we evaluate the effects of a caregiver-mediated exercises (CME) program after stroke. To date, little is known about the experiences of the participants involved. **Objective:** The research questions in this qualitative study were: 1) How do patient-caregiver couples exercise together in the Care4Stroke intervention? And 2) what does exercising together bring about, besides more hours of practice? **Patients and methods:** 7 Patients and 7 caregivers who completed the Care4Stroke intervention were interviewed. All interviews were recorded and verbatim transcribed. Two trained researchers independently identified recurring themes in the interviews, discussed them and consensus was sought. **Results:** Concerning our first question, an overarching theme was identified regarding role-dynamics between patient and caregiver, with three forms: a) the patient in control, b) in concert and c) the caregiver as informal carer. Related to our second question we identified three themes: 1) tailor made exercises through active involvement, 2) preparation for the home situation, and 3) opportunity to be involved. **Discussion and Conclusion:** The three types of role dynamics imply that 'exercise coaching' in CME is multidimensional. CME seems to empower patients and caregivers, with increased self-efficacy. Participants actively ask for (adjustments of) exercises and rehabilitation becomes more individualized. In addition, participants feel more prepared for the transition to home. **Clinical message:** For clinicians, it is important to be aware of the differences in role-dynamics during CME, and that wellbeing of patient and caregiver needs to be monitored and possibly redirected towards a more collaborative role-dynamic.

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34. An adapted test under a new light

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Evaluation and rehabilitation of hemi spatial neglect is of huge complexity. Our study aimed at adapting an existent tool to reach more ecological significance and to experiment it in a new way of rehabilitation by ambient light variation. We enlarged BIT cancellation of lines task, a classical A4 paper and pencil task, in an A0 (poster) format. Most of the lines were replaced by images of usual objects as founded on a dining table. Compared to the original task, this adaptation

added a clear ecological touch enhanced by the possibility to catch more extra-personal spatial neglect. As preliminary results, we tested our adaptation which showed a very good sensibility/specificity ratio in detecting spatial neglect between healthy controls (n=46), brain injured patients (n=9) and neglect patients (n=12). Afterwards we administered this task in a specific 'light corridor' allowing modulation of ambient light by variating different sources of dimmable lights. Brain injured patients with or without signs of spatial neglect underwent this evaluation with specifically lighting conditions. Although not statistically significant due to our too small number of patients, data analysis are promising as it shows the possibility to act directly on attentional bias of spatial neglect patients by modulating surrounding lighting. Preliminary research, with slightly different methods, already showed such results. This could open the way to lighting adaptations using head's position as central variable to determine adequate luminescent ratios of surrounding lighting. Direct infrastructure developments using such devices could enhance patient's autonomy at home or hospital.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_358712_98S3wjmF78.png

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35. Baseline characteristics in patients from an international prospective, non-interventional study to assess long-term effectiveness of abobotulinumtoxinA (ABO) in post-stroke arm spasticity (PSAS) with respect to time of ABO treatment-initiation post-stroke

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Introduction: Botulinumtoxin-A (BoNT-A) is an effective and well tolerated treatment in alleviating PSAS. Limited real-life evidence are available regarding the relationship between time of treatment-initiation post-stroke and development of spasticity. **Objective:** To present EARLY BIRD (NCT01840475) methodology and patient baseline characteristics (interim pre-planned analysis). **Patients:** 302 adult patients with PSAS, naïve or previously-treated with BoNT-A, were allocated according to time between stroke-occurrence and treatment-initiation (early, medium, or late initiation, according to first, second, or third quartile, respectively, classification per days). **Methods:** Patients received 4 ABO injection cycles. Demographics, arm spasticity patterns[1], composite MAS-score (elbow+wrist flexors), and pain (VAS) were recorded at baseline. **Results:** Baseline data n=281 patients. Compared to early treatment-initiation group, the late treatment-initiation group were on average older (early: 58.3, late: 62.1 years) and more likely to be female (early: 31.9%, late: 50.7%). Distribution of arm spasticity patterns was similar to previous reports[1]. Time (mean(SD)) between spasticity-onset and first ABO treatment was 2.3(1.7), 16.2(11.6), 146.2(106.3) months for early, medium and late treatment-initiation groups. Baseline pain was higher in patients from the early group vs medium and late groups (mean(SD): 4.6(2.8), 3.1(2.9), 2.4(2.7), respectively). Composite MAS-score was similar across groups. **Conclusions:** Approximately 11 years separated patients with early vs. late treatment-initiation in this non-interventional study, indicating ABO treatment remained appropriate many years post-stroke. Patients in the early-treatment group had higher baseline pain scores than those treated later. EARLY BIRD will assess long-term effectiveness of ABO according to time of treatment-initiation post-stroke, which could lead to improvement of clinical practices.

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36. Virtual reality for patients with aquired brain injury: do patients prefer a head mounted display or computer monitor?

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Introduction: Many patients with acquired brain injury (ABI) have cognitive problems. There is a positive trend in recent literature towards the use of virtual reality (VR) for the detection and treatment of cognitive impairments in patients with ABI. There are two primary setups of VR technology in cognitive rehabilitation: head mounted displays (HMD) or computer monitors (CM). **Objective**: (1) To determine which setup (HMD versus CM) is preferred by ABI patients versus healthy controls. (2) To investigate if demographic and ABI-characteristics are related to preference. **Patients**: 20 ABI patients (14 adults, 6 children) and 45 healthy controls (33 adults, 12 children) were included. **Methods**: In a within subject design, participants completed a VR shopping task on a HMD and a CM. Questionnaires were used to analyze preference and side effects. **Results**: There was no difference in preference for HMD or CM between patients and controls: 60 versus 65% had no specific preference, 25 versus 21% preferred a HMD and 15% versus 13.6% preferred a CM. Children had a stronger preference for the HMD. In adults with ABI there was no relation between preference and side of lesion, focal or diffuse lesions and cause of brain injury. Side effects did not influence preference. **Discussion and Conclusion**: There was no difference between healthy people and ABI patients in preference for VR-setups. Demographic and ABI-characteristics did not influence preference. Further research with larger groups is needed to analyze ABI subgroups. **Clinical message**: Both setups (HMD and CM) can be used in ABI patients.

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37. Validity and reliability of the Functional Gait Assessment in patients after stroke

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Introduction: Many patients after stroke suffer from balance problems while walking. The Functional Gait Assessment (FGA) is a 10-item performance test assessing walking balance. Measurement properties of the FGA in patients after stroke have not been sufficiently investigated. **Objective:** To determine the construct validity, inter-rater and test-retest reliability of the FGA. **Patients:** Patients after stroke receiving in- or outpatient rehabilitation in a rehabilitation centre. **Methods:** The FGA was assessed and recorded on video twice, and independently rated by three observers. Validity was evaluated by associating FGA outcomes with the 10-Metre Walk Test, Berg Balance Scale, Functional Ambulation Categories (FAC), 6-Minute Walk Test, and the mobility domain of the Stroke Impact Scale. Reliability was evaluated by intraclass correlation coefficients (ICCs), standard error of measurement, and smallest detectable differences. **Results:** Currently, data from 43 patients after stroke (mean age 64 ±12 years; median of 6 [P25;P75 5;10] weeks after stroke) were available. Significant correlations between the FGA and walking and balance tests were found (r=.63-.82, p<.01). Inter-rater reliability (n=23, ICC .90) and test-retest reliability (ICC .86) were good. The standard error of measurement was 2 points (10% of weighted mean), and the smallest detectable differences for individuals and the group were 6 (28%) and 1 points (4%), respectively. **Discussion and conclusions:** Preliminary analyses suggest that the FGA is a valid and reliable test to assess walking balance in patients after stroke and possibly more sensitive than the FAC. **Clinical message:** Walking balance in patients after stroke can be evaluated with the FGA.

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38. Assessing upper limb function: transcultural adaptation and validation of the Portuguese version of the Stroke Upper Limb Capacity Scale

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Background: Brachial hemiparesis is one of the most frequent sequelae of stroke (affecting up to 70% of patients in the acute phase), which leads to important functional disability given the role of the upper limb in executing activities of daily living (ADL). The Stroke Upper Limb Capacity Scale (SULCS) is a stroke-specific assessment instrument that evaluates functional capacity of the upper limb based on the execution of 10 tasks. **Aim**: The objective of this study is the transcultural adaptation and psychometric validation of the Portuguese version of the SULCS. **Methods**: A Portuguese version of the SULCS was developed, using the process of forward-backward translation, after authorisation from the author of the original scale. Then, a multicentre study was conducted in Portuguese stroke patients (n=122) to validate the psychometric properties of the instrument. The relationship between sociodemographic and clinical characteristics was used to test construct validity. The relationship between SULCS scores and other instruments was used to test criterion validity. **Results**: Semantic and linguistic adaptation of SULCS was executed without substantial issues and allowed the developed of a Portuguese version. The application of this instrument suggested the existence of celling effect. Reliability was demonstrated through the intraclass correlation coefficient of 0.98. In terms of construct validity, SULCS was sensible to muscle tonus and aphasia. SULCS scores were highly correlated with Motor Evaluation Scale for Upper Extremity in Stroke (MESUPES) and Stroke Impact Scale (SIS). **Conclusions**: The present version of SULCS is validated for use in the Portuguese population.

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39. Work-related medical rehabilitation in cancer survivors - 3-month follow-up results from a cluster-randomized trial

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Introduction: Effective rehabilitation programs that support return to work become increasingly relevant for cancer survivors. In Germany, such programs were established as work-related medical rehabilitation (WMR) comprising work-related diagnostics, functional capacity training, psychological groups, and intensified social counseling. **Objective:** The study investigated whether WMR leads to better results compared to conventional medical rehabilitation (MR) three months after rehabilitation. **Patients:** A total of 425 patients was analyzed with a mean age of 51 years (SD = 7.21), most being female (67%). Malignant neoplasms of breast and digestive organs were the most frequent reasons for rehabilitation. All participants had an elevated risk of not returning to work. **Methods:** Participants in groups were randomly assigned to WMR or MR. The standardized mean difference (SMD) was calculated as measure of effect size. **Results:** Results indicate better physical functioning (SMD = 0.32; 95% CI: 0.18, 0.46; p < 0.001), reduced fatigue (SMD = 0.30; 95% CI: 0.13, 0.47; p = 0.001), reduced pain (SMD = 0.21; 95% CI: 0.03, 0.38; p = 0.020), and increased distraction and self-encouragement (SMD = 0.20; 95% CI: 0.04, 0.37; p = 0.016) in favor of WMR. However, there were no effects on work participation outcomes. **Discussion and conclusions:** Results were in favor of WMR for cancer survivors with an

elevated risk of not returning to work three months after rehabilitation, though effects are small. **Clinical message:** The WMR program increased physical functioning and distraction and self-encouragement and reduced the perception of fatigue symptoms and pain in the short run.

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40. Influence of body posture on muscle loading while playing the clarinet

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Introduction: Musculoskeletal complaints are highly prevalent in clarinettists and are related to high loads on the arm while playing. **Objective**: Study to what extent specific body postures influence muscle load. **Patients**: Healthy, (pre)professional clarinetists, naive to postural exercise therapy. **Methods**: Cross-sectional study comparing two postures: habitual sitting posture (CO) versus posture according to postural exercise therapy Mensendieck, method Samama (EXP). A standardized music piece was played in CO, and, after 30 minutes of instructions, also played in EXP. Markers gauged body posture. Muscle activity of the erector spinae L3, latissimus dorsi, lower and upper trapezius, pectoralis major, biceps brachii, and brachioradialis was recorded bilaterally using surface electromyography (EMG). Differences in mean rectified EMG signal power and signal variance between postural conditions were tested using paired-samples t-tests. Regarding between-muscle comparisons, mean within-muscle ratios of CO/EXP were log-transformed to counteract data skewing. **Results**: Twenty clarinetists (M/F=9/11) were included. Mean age was 29.25±10.16 years. Comparing EXP to CO, the trunk was inclined forward, with reduced spinal curvatures. Significant within-subject differences between CO and EXP were found for left erector spinae L3 and bilateral lower trapezius which were more active during EXP, whereas right brachioradialis was less active in EXP. Left upper trapezius muscle showed less variance in EXP. Mean log transformed ratios confirmed these results. **Discussion and conclusions**: This pilot study suggests that muscle loading while playing clarinet is influenced by body posture. **Clinical message**: Optimizing body posture may prevent muscle (over-)loading in body areas prone to developing injuries.

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41. Effects of arthroplasty and rehabilitation in patients with osteoarthritis of the proximal interphalangeal phalanx joint: results of the Amsterdam hand cohort

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Study Design: Prospective observational cohort study. **Introduction**: Osteoarthritis (OA) of the proximal interphalangeal phalanx (PIP) joints results in impairments and activity limitations. Studies addressing the effects of arthroplasty mainly focus on the effects on impairments such as range of motion or pain. **Purpose of the study:** To evaluate the effects of PIP arthroplasty and rehabilitation focusing on activity limitations in patients with OA. **Methods:** Participants of the Amsterdam hand (AMS-hand) cohort were screened for eligibility. Selection criteria: indicated for primary PIP arthroplasty. Intervention: Neuflex® silicone prosthesis and perioperative rehabilitation. Measurements: before, 3 and 6 months after surgery. Primary outcomes: patient-specific activity limitations (Canadian Occupational Performance

Measure [COPM]). Secondary outcomes: range of motion (ROM), strength (kg), pain (Numerical Rating Scale [NRS]), hand-specific activity limitations (Australian/Canadian Osteoarthritis Hand Index [AUSCAN], the Disabilities of Arm, Shoulder and Hand questionnaire [DASH] and the Michigan Hand Outcomes Questionnaires [MHQ]), global perceived effect, and patient-specific (COPM), hand-specific (MHQ) and global satisfaction. **Results:** 17 patients (mean±SD age 63±9y.; 14 [82%] female; 15 [88%] primary OA) underwent surgery of 27 PIP joints. The mean±SD patient-specific activity limitations score decreased (COPM -2.5±2.4, p<0.001) at 3 months follow-up. ROM did not change. Grip strength increased. Pain decreased (NRS -2.3±4.0, p<0.05). Hand-specific activity limitations decreased (AUSCAN -4.1±5.6, p<0.05; DASH -10.4±12.0, p<0.01; MHQ -0.4±0.9, p=0.09). Most patients perceived a beneficial global effect. Patient-specific (COPM -1.9±1.9, p=0.001), hand-specific (MHQ 20.8 ± 24,4, p=0.004). **Conclusions:** PIP arthroplasty and rehabilitation decreased activity limitations in patients with OA of the PIP joints. **Level of Evidence: 4**

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42. Validity and reliability of the French translation of the VISA-A questionnaire

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Introduction: The Victorian Institute of Sport Assessment – Achilles tendinopathy questionnaire (VISA-A) evaluates the clinical severity of Achilles tendinopathy. The aim of this study was to translate the VISA-A into French and to study the reliability and validity of this French version, the VISA-AF.Method: The VISA-A was translated into French to produce the VISA-AF using a validated methodology in six steps. Thereafter, several psychometric properties of this French version such as test–retest reliability, internal consistency, construct validity and floor and ceiling effects were evaluated. Therefore, we recruited 116 subjects, distributed into 3 groups: pathological patients (n=31), at-risk athletes (n=63) and healthy people (n=22). **Results**: The final version of the VISA-AF was approved by an expert committee. On a scale ranging from 0 to 100, the average scores of the VISA-AF obtained were 59 (± 18) for the pathological group, 99 (± 1) for the healthy group and 94 (± 7) for the at-risk group. The VISA-AF shows excellent reliability, low correlations with the discriminant subscales of the SF-36 and moderate correlations with the convergent subscales of the SF-36. **Conclusions**: The French version of the VISA-A is equivalent to its original version and is a reliable and valid questionnaire for French-speaking patients with Achilles tendinopathy.

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43. Cross-cultural adaptation and validation of the Kujala Anterior Knee Pain Scale (AKPS) questionnaire for French-speaking patients

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Introduction: The femoropatellar syndrom is one of the most common knee problem observable. The Kujala Anterior Knee Pain Scale (AKPS) is a questionnaire used to examine the subjective symptoms, such as the functional limitations and the anterior knee pain. **Objective**: The aims of the study were to translate and cross-culturally adapt the AKPS

questionnaire into French and to evaluate the reliability and validity of this translated version of the questionnaire (AKPS-F). **Patients** : 101 patients with femoropatellar syndrom. **Methods**: The translation and the inter-cultural adaptation of the questionnaire has been adopted through the international recommendations highlighting 6 different steps : initial translation, translations synthesis, translation back to the original language, committee of experts, test of the pre-final version and the approval from the expert's committee. Indeed the French version obtained, the participants have filled twice the AKPS with an interval of 7 days, and the Short Form Health in order to evaluate the psychometric properties (the internal coherence, the test-retest fidelity and the built validity). **Results**:The AKPS shows a high level of fidelity in the test-retest with a score of 0.97. The French translation also has a high internal coherence score with 0.87. The Kujula shows a great correlation with a part of the converging sub-scales from the SF36. There is a low/average correlation noticeable with the diverging sub-scales. There is no floor/ceiling effect. **Discussion and conclusions**: This study shows that AKPS-F is reliable and valid for the French patients suffering from a femoropatellar syndrom and can therefore be used.

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44. Cross-cultural adaptation and validation of the Patient-Rated Tennis Elbow Evaluation Questionnaire on lateral elbow tendinopathy for French-speaking patients

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Introduction: The lateral elbow tendinopathy is a common injury in tennis players and physical workers. The Patient-Rated Tennis Elbow Evaluation (PRTEE) Questionnaire was specifically designed to measure pain and functional limitations in patients with lateral epicondylitis. The aims were to adapt the PRTEE questionnaire into French (PRTEE-F) and to evaluate the reliability and validity of this translated version of the questionnaire . **Methods**: The PRTEE was translated and cross-culturally adapted into French according to international guidelines. To assess the reliability and validity of the PRTEE-F, 115 participants were asked twice to fill in the PRTEE-F, and once the DASH and the SF-36. Internal consistency (using Cronbach's alpha), test-retest reliability (using intraclass correlation coefficient (ICC), standard error of measurement and minimal detectable change), and convergent and divergent validity (using the Spearman's correlation coefficients respectively with the DASH and with some subscales of the SF-36) were assessed. **Results**: The PRTEE was translated into French without any problems. PRTEE-F showed a good test-retest reliability for the overall score (ICC 0.86) and for each item (ICC 0.8-0.96) and a high internal consistency (Cronbach's alpha ¼ 0.98). The correlation analyses revealed high correlation coefficients between PRTEE-F and DASH (convergent validity) and, as expected, a low or moderate correlation with the divergent subscales of the SF-36 (discriminant validity). There was no floor or ceiling effect. **Discussion and Conclusions**: The PRTEE questionnaire was successfully cross-culturally adapted into French. The PRTEE-F is reliable and valid for evaluating French-speaking patients with lateral elbow tendinopathy.

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45. Muscle strength profile of patients with patellar tendinopathy

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Introduction: Patellar tendinopathy (PT) is commonly observed in jumping sports. Even if its biomechanic is somewhat explored, no information is known about the muscle strength profile of these patients. **Objective:** To determine if there exists a specific profile of patients suffering from a PT. **Patients:** 43 patients (29+/-9.8 y.o) suffering from PT were recruited. To be eligible, the patients must not have suffered from any other traumatic or micro-traumatic injury than the PT on the pathologic limb. **Methods:** After a physical examination, the tendon damage was assessed by ultrasounds examination. The patients were then tested on an isokinetic dynamometer and the maximum torque (per unit of mass, MTm) developed by the quadriceps and the hamstrings were recorded for various angular velocities. After each test, a visual analog scale (VAS) was used to estimate the pain felt by the patients. **Results:** No significant correlation was found between the MTm and the demographic variables. The difference in MTm between the healthy and the pathological limbs was significant only at a rate of 60°/s, for both the quadriceps and the hamstrings. Lastly, the VAS score showed that the most intense pain was experienced after the eccentric test. **Conclusions:** There is no clear patient strength profile emerging from the isokinetic test. This stresses the importance for the clinicians to make testing and to apply a personalized treatment to each patient. Finally, the isokinetic eccentric testing of the quadriceps can be used to induce a mechanical stress on the tendon for a reliable pain assessment.

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46. The Microcirculation Changes of the Upper Limb Overused Muscles Measured by Laser Doppler after the Repeated Thermostress Treatment in Industrial Workers

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Introduction: The musculoskeletal (MS) overuse, especially in upper limbs is a growing problem in industrial workers Insufficient blood supply to muscles plays a primary role in the development of overload disease. **Objective:** To measure the level of microcirculation (MC) with laser Doppler flowmetry (LDF) for detecting the effectiveness of the traditional warm applications as a rehabilitation method among the people with work-related upper limb overuse syndrome. **Patients:** 45 industrial workers with upper limb overuse were exposed to the repeated whole body thermostress with 42 ^{0}C warm sea mud. **Methods:** LDF measurements were done before the 1st, after the 1st, and after the 9th treatment. The results were analyzed in 2 subgroups: first with relatively low basic perfusion (PU) and second with relatively high basic PU before the treatment. **Results**: In the group with relatively low basic PU, the rise of PU due to the first thermostress provocation was 18.13 % and after the 9th thermostress sessions 27.9 % (p`=0,014). **Discussion and conclusions:** The subgroup with higher basic PU level had no significant changes in PU due to the repeated thermostress with warm mud. Repeated thermotherapy rose the MC values in the overused muscles only in the low PU subgroup due the LDF method data. **Clinical message:** The repeated thermostress with warm sea mud is an appropriate rehabilitation treatment for the people with the relatively low MC in upper limbs due the work-related MS overuse.

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47. Ultrasound characteristics of the lumbar multifidus: a systematic review

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Objective: To provide a summary of the current literature concerning ultrasound characteristics of the lumbar multifidus muscle. Healthy subjects as well as patients with chronic low back pain were the subject of this review. Intervention studies were excluded. **Search strategy:** Studies were identified by searching Pubmed, Embase and Web of Science and scanning reference lists of articles. The following search terms were used for all electronic databases: ("spine muscle" or multifidus or "lumbar muscle" or "paraspinal muscle" or "paravertebral muscle") AND (ultrasound or ultrasonography or echography). **Selection of articles:** After removal of duplicates, assessment for eligibility was performed independently by 2 reviewers. The search of Pubmed, Embase and Web of Science databases provided a total of 997 citations. After adjusting for duplicates 712 remained. A total of 30 studies were identified for inclusion in the review. **Evaluation of articles and results:** Two reviewers independently extracted the following data from all included articles: author, publication year, population (number, age, gender), ultrasound technique, measurement position, outcome measures and main results. Risk of bias was assessed by the same two reviewers by using an adapted version of the validated Downs and Black evaluation tool for non-randomized studies. **Conclusion:** An overview of the effect of age, gender, BMI, lumbar level, side, and presence of LBP on CSA as well as thickness of the lumbar multifidus is provided.

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48. Periostitis as a first manifestation of large vessel vasculitis mimicking medial tibial stress syndrome: a case report

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We report a case of a 47-year old woman with isolated periostitis of the lower leg as a first manifestation of large vessel vasculitis, mimicking medial tibial stress syndrome (MTSS) by its clinical presentation. True diagnosis was first suspected when a second MRI of the lower leg approximately 4 months after onset of shin pain showed edema near intramuscular vessels. These findings suggest a common inflammatory process, in contrast to all other cases described in literature of large vessel vasculitis presenting with periostitis, where an independent process of inflammation or hypoxemia was suggested as the main mechanism. Isolated periostitis is a very rare skeletal manifestation of systemic vasculitis and could easily be misdiagnosed. This case demonstrates that even for a very common problem as MTSS, awareness for differential diagnosis is important if patient history isn't entirely consistent.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_362390_7XvsGRMvNQ.png
Caption 1: Bone scan

Picture 2: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img2_362390_7XvsGRMvNQ.png
Caption 2: MRI scan

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49. Is the 2-minute walk test a good proxy method to determine cardiorespiratory fitness in severely fatigued persons with MS?

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Introduction: Cardiopulmonary exercise testing (CPET) using ergometry (e.g. cycling, treadmill, stepping) is considered the 'gold standard' for the assessment of aerobic fitness in healthy people and people with medical conditions. These laboratory-based tests require expensive and cumbersome equipment. Walking tests, like the 2- and 6-min test, are simple, performance-based tests, and might be a good proxy measure for CPET. **Objective:** To determine whether the 2MWT is a valid alternative for laboratory exercise testing of cardiorespiratory fitness. **Patients:** 141 patients with MS-related fatigue (mean age 47.0, 73% women, type of MS: RRMS 99, PPMS 14 , SPMS 9, other/ unknown 16). **Methods:** Patient data (2MWT in meters, VO2 max in ml/kg/min, age, gender, MS type, and time since diagnosis) were gathered before treatment started. Relation between variables was analyzed by means of Pearson's correlation coefficient and linear regression analyses. **Results:** The Pearson's correlation coefficient of the 2MWT and VO2max was 0.441 (95% CI: 0.309-0.570). The aerobic fitness in men was significantly higher than in women (mean difference 2.860 mL/kg/min, 95% CI: 0.729-4.990). However, the relationship between 2MWT and VO2max was not significantly different between men and women (β= 0.006, 95% CI: -0.038 to 0.050). Type of MS had no significant influence. **Discussion and conclusions:** The moderate correlation between the 2MWT and VO2max, makes us to conclude that the 2MWT is not a valid alternative for CPET. **Clinical message:** Although the 2MWT is more practical than the CPET, clinicians should not use the 2MWT as a proxy measure to assess cardiorespiratory fitness.

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50. Study of outcome of rehabilitation following Guillain-Barré Syndrome in The Phoenix Centre for Rehabilitation

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Introduction: Guillain-Barré Syndrome (GBS) is a group of acute inflammatory disorders affecting peripheral nervous system. Its key features are limbs weakness, sensory deficits and neuropathic pain. Cranial nerves may be involved. **Objectives:** The aim of this study was to ascertain number of patients coming back close to their baseline following onset of the GBS. As objectives, we used return to work or previous role in the community, discharge destination and independence with transfers, mobility and personal care. **Methods:** A retrospective study has been carried out in March 2017. All patients admitted to Phoenix in period 06.2013 – 02.2017 were included. Discharge summaries and clinical letters. were studied. **Patients:** In studied period there was 274 admissions to Phoenix. 8 of them (3 males) presented with GBS. Average age on admission was 56.3 and average length of stay 75 days. **Results:** On admission 75% of patients were immobile, and used full body hoist for transfers. On discharge all patients were mobile independently, 87% needed assistive device to mobilize, in comparison to 12.5% after 3 months. All patients were discharged home, one needed package of care. All of them came back to their previous work or role in the community. **Discussion:** There is a number of studies analyzing functional outcome of Guillain- Barre Syndrome, however only little concentrate on involvement in work and community life. **Clinical message:** Patients do improve well following GBS however their participation may be potentially affected by fatigue, pain and body image issues.

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51. Plantar foot pressures, footwear adherence, and ulcer recurrence in diabetic patients with Charcot foot deformity

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Introduction: Despite the significant risk of foot ulceration in patients with Charcot deformity, minimal data on footwear efficacy and ulcer recurrence is available. **Objective**: To analyze plantar foot pressures, footwear adherence and ulcer recurrence in diabetic patients with Charcot deformity. **Patients and Methods**: Twenty-one Charcot diabetic patients with ulcer history were compared to 150 non-Charcot diabetic patients with ulcer history for barefoot and in-shoe plantar pressures, footwear adherence (in percentage of steps that footwear was worn) and ulcer recurrence at 18 months. **Results**: The Charcot group showed significantly higher median [1st QR, 3rd QR] barefoot and in-shoe plantar pressures in the midfoot region (756 [234, 1274] kPa vs. 137 [93, 197] kPa, and 149 [115, 200] kPa vs. 120 [95, 143] kPa respectively), while other foot regions showed significant lower peak pressures compared to the non-Charcot group. Footwear adherence was significantly higher in Charcot patients (95 [82, 98]% vs. 78 [55,92]%), especially when being at home (94 [86, 95]% vs. 68 [27,89]%). Ulcer recurrence was similar between groups (42.9% vs. 41.3%), but relatively more midfoot ulcers occurred in the Charcot group. **Discussion and Conclusion**: Although Charcot patients wear their prescribed shoes and have generally low in-shoe peak pressures, ulcer recurrence is not lower than in non-Charcot patients. Higher midfoot plantar pressures may explain the relatively more midfoot recurrent ulcers in the Charcot group. **Clinical message**: Further optimization of custom-made footwear seems indicated, in particular in the midfoot region, in patients with diabetes, midfoot Charcot deformity and ulcer history.

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52. Novel rehabilitation protocols after reconstructive arm-hand surgery for patients with a cervical spinal cord injury: a single case experimental design

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Background: In patients with a cervical spinal cord injury (C-SCI), functioning in daily life is strongly determined by decreased arm-hand dexterity. Novel reconstructive arm-hand surgery procedures have led to reduced length of inpatient stay post-surgery, necessitating novel rehabilitation treatments that need to be protocolled and tested as to their effectiveness. This study aimed to (a) develop such rehabilitation treatment protocol, and (b) examine the 'order-of-magnitude' of its potential benefit. **Methods:** One C-SCI patient was studied in a single case experimental design. Primary outcome parameters were: arm-hand dexterity (Rasch-analysed Van_Lieshout_arm-hand_test_for_Tetraplegia _Short_Form (r_VLT-SF_{100})) and quality of life. Secondary outcome parameters were: patient's perceived therapy effectiveness; active range of motion (AROM); muscle tone; muscle strength; and grip and pinch strength. Data were gathered at baseline (t1), post-intervention (t2) and twelve weeks follow-up (t3). Data were analysed descriptively. **Results:**. Reconstructive arm-hand surgery included novel procedures in tendon transfer to improve hand grip. Post-surgery rehabilitation included faster/early mobilization (within days), a condensed clinical rehabilitation treatment (2-weeks) and a home-based modular personal goal-oriented, functional treatment (8-weeks). Improvements were found for r_VLT-SF_{100} (mean: 53.3 (t1); 52.2 (t2); 56.3 (t3)); AROM of the wrist, metacarpo-phalangeal and proximal interphalangeal joints of the thumb and index finger; muscle tone; muscle strength; grip strength (mean force: 214.1N (t1); 191.1N (t2); 230.2N (t3)); and patient's perceived therapy effectiveness (GAS: -2 (t1); +1 (t2); +2 (t3)). No changes in

quality of life were observed. **Conclusion:**. The novel protocol looks promising. Further research is warranted to provide conclusive evidence on the protocol's effectiveness.

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53. Relations between motor recovery of upper extremities and mobility after SCI

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Introduction: The functioning of people with Spinal Cord Injury (SCI) mostly is determined by the impairment of upper limbs motor functions, whose recovery during motor training is one of the main aims of rehabilitation. **Objective:** To investigate the relations between motor functions of upper limbs and mobility recovery after SCI during rehabilitation and in 1-3 years follow-up. **Patients:** In total, 109 persons with SCI participated in research during 2012-2016 years. **Methods:** The problems of motor functions of upper limbs and mobility were evaluated using Comprehensive ICF Core Set for SCI during inpatient rehabilitation and in 1-3 years after discharge. **Results:** There were found correlation between mobility recovery (as maintaining body position, transferring oneself, moving in wheelchair) and upper limb's muscle strength ($r=0.759$, $p<0.001$), muscle tone ($r=0.425$, $p<0.001$) and endurance ($r=0.326$, $p<0.001$), dysfunction of supporting muscle ($r=0.127$, $p<0.05$), presents of pain ($r=0.786$, $p<0.001$) during rehabilitation. In long-term context mobility skills were more associated with physical endurance ($r=0.496$, $p<0.001$), body weight support dysfunctions ($r=0.583$, $p<0.001$), ability to lifting and carrying objects ($r=0.397$, $p<0.05$) and indicated the participation level in daily life. **Discussion and conclusions:** Rehabilitation is more focused on recovery of the physical and functional state. Persons with SCI naturally engaging and participating in various areas of life gradually improved their mobility and motor functions of upper limbs every year after SCI. **Clinical message:** Rehabilitation should encourage the physically active lifestyle of people with SCI.

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54. Back to the community with disability

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Introduction: Spinal cord injury (SCI) causes the loss of biopsychosocial functions, limitations in daily life, changes of social activities and interactions. **Objective:** To analyse the changes of social activities in 1-7 year after SCI.
Patients: Totally, 74 people with SCI participated in research during 2009-2016 years. **Methods:** The first assessment was performed at the end of inpatient rehabilitation in the Centre of Rehabilitation, Physical and Sports Medicine, Vilnius University Hospital. The second assessment was performed after 1-7 years. Life Situation Questionnaire-revised (LSQ-r) was used for evaluation social activities; Comprehensive ICF Core set for SCI – for evaluation activities and participation in different life areas. Ethical approval has been obtained from the Lithuanian Bioethics Committee. **Results:** In 1-7 years after SCI participation increased in household chores and sports/recreation activities ($p<0.001$), the number of persons with higher education increased from 18.1% to 27.2% ($p<0.05$), employment increased from 6.3% to 29.4% ($p<0.001$), the full day of moderate intensity jobs dominated (homework's, fixed-term jobs and works to order). The correlation was

found between the participation in social activities and the time after SCI (r=0.472, p=0.006), ability to overcome stress and solve the problems (r=0.132, p=0.012), self-confidence (r=0.361, p=0.014) and social support (r=0.734, p=0.001). **Discussion and conclusions:** The present study indicates that in people with SCI, motivation and interest in being socially active increased each year after SCI in 1-7 years. **Clinical message:** Removal of barriers coupled with promotion of facilitating factors, ensuring social support were enhancing opportunities for successful integration to the community.

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55. Effect of visual feedback-induced variable practice on the upper-limb dynamics and shoulder complex loading in novice handrim wheelchair users

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Introduction: Handrim wheelchair propulsion is often associated with overuse injuries of the shoulder complex. **Objective**: To examine the influence of visual feedback-induced variable practice on the upper-limb dynamics and shoulder complex loading during handrim wheelchair propulsion. **Patients**: Able-bodied **Methods**: Seven participants received 56 min of visual feedback-induced variable practice on a motor-driven treadmill (velocity=1.11 m/s; power output=0.24 W/kg). The 12 min pre- and the post-test were performed without visual feedback. Between the pre – and the post-test, participants performed seven 8-min practice sessions, where they received real-time visual feedback on one of seven different propulsion technique variables. They were instructed to manipulate the presented variable to achieve the highest possible variability (1st 4-min block) and optimize it in the prescribed direction (2nd 4-min block). **Results**: The mean glenohumeral reaction force per cycle decreased in 5 out of 7 participants, approaching significance (286 ± 76 N → 236 ± 33 N, p=0.069). The range of motion of the upper arm increased in 6 participants (humeral medial epicondyle displacement, 283 ± 67 mm → 340 ± 47 mm, p=0.072), approaching significance. **Discussion and conclusions**: Although the study parameters changed in a favorable direction in the majority of participants, results over the whole group did not reach significance. This might be related to the small sample size and large standard deviation within the group. **Clinical message**: Visual feedback-induced variable practice may contribute to the decrease in shoulder loading during wheelchair propulsion but a larger sample size is necessary to confirm the potential effects.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_358274_Q9jyF0JYxK.jpg
Caption 1: Participants received real-time visual feedback on a different propulsion technique variable at each practice session.

Picture 2: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img2_358274_Q9jyF0JYxK.jpg
Caption 2: Typical example of one push cycle for the pre and the post-test for one person. Reaction force vector in relation to the trajectories of body segments

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56. Cervical spinal cord injured patients' pre-operative expectations regarding arm-hand skill performance and participation after arm-hand surgery

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Introduction: Patients with a cervical spinal cord injury (C-SCI) have to consider many far-stretching and complex issues before deciding to undergo arm-hand surgery. Caregivers may support patients in this decision by translating the envisaged surgical outcome at function level towards participation goals. However, measures gauging both the rehabilitation team's and patients' expectations are lacking. **Objectives**: To assess the usability of a) two adapted versions of the Lamb_&_Chan questionnaire (L&C), b) the USER-P questionnaire, and c) an adapted version of the latter, to gauge patients' perceptions and expectations on arm-hand-skill-performance (AHSP) and participation before and after possible surgery. To assess the usability of the L&C and USER-P, both adapted to accommodate the rehabilitation team's expectations regarding this matter. **Patients**: C-SCI patients eligible for reconstructive arm-hand surgery. **Methods**: The aforementioned questionnaires were presented to patients and the team's hand-therapists prior to possible surgery. Initial results are reported descriptively. **Results**: Currently, five chronic, incomplete C-SCI patients (lesion:C4-C6; M/F=2/3; age:29-60yrs) have been assessed. Initial L&C results are reported in table_1. Four patients revealed no differences in current/expected USER-P scores. One patient expected mild progression in 2 of 3 USER-P-categories. **Discussion and conclusions**: Overall, the team expects more extended progression after surgery than patients do. Patients' pre-surgery scope regarding potential gains seems rather limited. However, more research is necessary. **Clinical message**: The team should aid patients in widening their scope on post-surgery AHSP prospects.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/7DCRM/img1_359207_dSjpBxnq4V.png
Caption 1: Table 1

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58. Elbow flexion contractures in neonatal brachial plexus palsy: a one-year comparison of serial casting and dynamic orthosis

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Introduction: About 50% of patients with neonatal brachial plexus palsy develop elbow flexion contractures. Contracture reduction treatment comprises either static or dynamic stretching through serial casting or dynamic night orthosis. We compared elbow contraction reduction by a dynamic night orthosis with serial circular casting followed by night-splinting over a one year period in a single blind randomized controlled trial. **Patients:** Fourty-four patients with elbow flexion contractures ≥ 30° were enrolled in the two study arms: dynamic orthosis group (25) and serial casting group (19). **Methods:** Passive elbow range of motion angles were measured at enrolment and at eight (t1), twenty (t2) and fifty-four weeks (t3). Functional goals at the ICF activity level were evaluated using Goal Attainment Scaling (GAS), comfort was scored with a 10-point Visual Analogue Scale (VAS). Treatments were compared using Multi Variate Analysis with repeated observations. **Results:** For orthosis compared to casting we found a change over time at t1 mean 7° (SD5°) versus 13° (SD9°), at t2 9° (SD7°) versus 14° (SD6°), at t3 10° (SD8°) versus 13° (SD12°). At 54 weeks no significant contracture differences between treatments were found. At t1 and t2 a p-value of 0.009 and 0.014 was found respectively. GAS-scores improved equally in both groups up to at least two points or more in 34 patients indicating full goal attainment. No difference in comfort was found. **Conclusions:** Elbow flexion contracture reduction after one-year follow-up was comparable for both serial casting and the dynamic orthosis. Serial casting seems to have a quicker effect.

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59. Mapping the field of acquired childhood aphasia (ACA)

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Introduction*:* Treating acquired childhood aphasia is very complex, since it is very rare and the population is heterogeneous in terms of aetiology, age and severity. In contrast with the growing evidence for the efficacy of aphasia treatment for adult stroke patients, there is hardly any treatment research on children with ACA. This lack of evidence for specific treatment approaches leads to insecurity about treatment, and therapy approaches may vary considerably across treatment settings. **Objective***:* To establish a national treatment database of children with ACA and to investigate recovery in order to optimise rehabilitation treatment in the Netherlands. **Patients***:* Children with ACA, age 2-18 years. **Methods***:* In a multi-centre study, a three round Delphi procedure is used to reach consensus among professionals on diagnosis, assessment, and variables in a shared database. Results of language assessment at 1, 3 and 6 months post injury will be collected. Questionnaires will be used to assess treatment satisfaction among parents, professionals and, where possible, children themselves. **Results***:* The Delphi procedure was met with great enthusiasm. Of all 26 rehab clinics invited, 23 participated. Of the 6 children's hospitals invited, 5 participated, all of these academic hospitals. **Discussion, conclusion and clinical message***:* The results of the Delphi procedure enable us to formulate a -widely supported- core set of outcome measures (April 2017), to be used in all treatment centres participating in the national database. This database will provide high quality observational data to inform the optimisation of aphasia treatment in children in the Netherlands.

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60. Participation in youth with acquired brain injury admitted for rehabilitation treatment

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Introduction: Research in pediatric acquired brain injury (ABI) traditionally focuses on outcomes regarding physical, mental and cognitive functioning. Prospective studies comprehensively describing participation are scarce. **Objective:** To describe the impact of pediatric (non-)traumatic ABI on patient-reported participation in youth at start of their treatment in one Dutch rehabilitation centre. **Patients:** Youth aged 14-25 with ABI referred to a rehabilitation centre.**Methods:** Data were gathered at admission by review of medical records and questionnaires. Participation was measured using the Child and Adolescent Scale of Participation questionnaire (CASP-Y). In addition, sociodemographic/ABI characteristics were recorded and patients completed the PedsQL-HRQoL and PedsQL-Fatigue. All scores range 0-100; higher scores represent better functioning. Descriptive analyses were conducted (median score, interquartile range (IQR)) and

Spearman-rank correlations were computed to test the association between CASP-Y and PedsQL-HRQol and PedsQL-Fatigue. **Results:** Twenty-four patients were included, 13 (54%) male, median age 18 years (IQR:16-22), median time since ABI 11 months (IQR:2.6-62) and 14 (58%) having traumatic ABI. The median CASP-Y total score was 88.7 (IQR:76.3-95.0), whereas subscale scores for participation at home, community, home/community and school were 91.7 (IQR 84-100), 83.3 (IQR62.5-100), 90.0 (IQR:80.0-92.5) and 87.5 (IQR:71.3-100), respectively. There was a significant correlation between CASP-Y and PedsQL-HRQol (r_s=0.61,=p=0.003) and PedsQL-Fatigue (r_s=0,67,=p=0.001), respectively. **Conclusion:** Youth with ABI admitted for rehabilitation, show relatively high levels of participation according to the CASP-Y, with more participation being related to better HRQoL and less fatigue. Whether the CASP-Y is capable of identifying participation restrictions most relevant to youth with ABI remains to be established.

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62. Extracorporeal shock wave therapy (ESWT) for muscle spasticity in cerebral palsy (CP): a systematic review (SR)

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Objective: To seek the most effective intervention protocol of ESWT to improve muscle spasticity in cerebral palsy and the reliable outcome measures. **Search Strategy:** English written literature search of randomised controlled trials (RCT) was conducted in Pubmed, PEDro e Cochrane with keywords alone and in combination ("extracorporeal shock wave therapy", "spasticity", "cerebral palsy"). Bibliography of traced studies were also screened. **Selection of articles:** Eight studies were selected: 3 RCT, 1 prospective case-controlled, 2 pseudo-controlled and 2 pilot studies. The concomitant use of anti-spastic drug was an exclusion criteria. Topics assessed were: application site, ESWT type, number of impulse, pressure/energy flux density, number and periodicity of sessions, outcome measures, and results. Dutch platform EBRO was used for quality assessment of evidence, and in accordance to the Cochrane Risk of Bias, the online machine learning system of Robot Reviewer was used. **Results:** The performed screening of titles, abstracts and full articles culminated in eight studies for examination. The quality of the RCT articles ranged from 4/10 and 6/10 (PEDro scale). Besides the lower level of the evidence, ESWT is effective in treating muscle spasticity in patients with CP. **Conclusions:** Suggested protocol and outcomes: 3 weekly sessions (1 per week) of 1500 impulses at air pressure of 1,5 bar, or 0.03 mj/mm2 of energy density, applied at a frequency of 8 Hz on muscle bellies, using radial or focal equipment; range of motion, Ashworth scale and modified Ashworth scale are reliable outcomes measures. Limitations are due to methodological differences between the studies.

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63. Responsiveness and minimal important change of the Pain Disability Index in patients with chronic pain after attending pain rehabilitation or vocational rehabilitation

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The Dutch association of rehabilitation physicians have selected the Pain Disability Index (PDI) questionnaire as a performance indicator of rehabilitation programs for patients with chronic pain. However, the responsiveness and minimal important change of the PDI are currently unknown for patients with chronic pain. To assess the responsiveness and minimal important change (MIC) of the PDI in patients with chronic pain after pain rehabilitation and vocational rehabilitation. The study population consisted of patients attending pain rehabilitation or vocational rehabilitation in the Netherlands. Baseline and discharge data were collected using webbased questionnaires. MIC was defined as the ability of the PDI to detect the smallest change in score which patients perceive as important. We used the anchor-based method to calculate the MIC. Sensitivity and specificity for change plotted by receiver operating characteristic (ROC) curve and area under the curves (AUCs) were calculated. Patients attending pain rehabilitation (N=82) and vocational rehabilitation (N=198) were included. Mean baseline and discharge scores of PDI were: 41.8 (±10.5) and 27.4 (±14.9) (pain rehabilitation), and 34.2 (±11.9) and 23.3 (±13.8) (vocational rehabilitation). The PDI was responsive for change after attending pain rehabilitation (AUC 0.78, sensitivity 0.72, specificity 0.72, MIC 9.5) and vocational rehabilitation (AUC 0.75, sensitivity 0.68, specificity 0.71, MIC 5.5). The PDI is a responsive questionnaire for patients with chronic pain after attending pain rehabilitation or vocational rehabilitation. In patients with chronic pain, change can be considered clinically important when PDI score has decreased 9.5 points after pain rehabilitation and 5.5 points after vocational rehabilitation.

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64. Conservative treatment in patellofemoral instability - the experience from a pediatric department of physical and rehabilitation medicine

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Introduction: Acute patellofemoral dislocations (PD) have an incidence of 5.8 per 100000 patient/year, accounting for 2-3% of all knee injuries. Primary episode mostly affects young, physically active females. Rates of recurrent patellar instability (PI) have been estimated as 15-80%. **Objective:** To describe the demographics and clinical evolution after conservative management of a pediatric population with primary PD or PI and to determine predictors of recurrent instability. **Patients:** Inclusion criteria 1) ≤ 18 years; 2) PRM appointment with inaugural PD or PI; 3) radiographic study in the first month; 4) ≥ 12 months follow-up. **Methods:** Single-institution, retrospective review of patients with acute PD or PI between March 2013 – September 2015. Radiographs were evaluated for trochlear dysplasia and patella alta. Lower limb malalignment and hypermobility syndromes based on clinical registries. **Results:** A total of 31 knees in 31 patients met the inclusion criteria, 20 females (64.5%) and 11 males (35.5%), with an average of 13.3 years (range 8-16 years). All 31 patients (100%) had conservative treatment. 23 (74.2%) had ≥ 1 risk factor for PI. The number of risk factors was associated with rate of recurrent PD (p=0,049). At 12 months, 14 patients (45.2%) were asymptomatic, 16 (51.6%) had recurrent PD and one (3.23%) maintained PI or pain without PD. **Discussion**, **conclusions and clinical message:** Non-operative treatment for inaugural PD/PI was disappointing. Lower success rates were observed in subjects presenting risk factors (29%). Additional research must clarify the best approach for those patients with expected higher rates of recurrent instability.

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65. Perceived changes in Quality of Life after trauma: a focus group study

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Introduction: Trauma survivors can experience lasting impairments and disabilities. How these influence patients' Quality of Life (QoL) is still insufficiently known. **Objective:** To qualitatively investigate perceived changes in QoL after trauma and to examine the face validity of the World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire. **Patients:** Trauma patients admitted to a level I trauma center. **Methods:** Four focus groups were conducted. Audio-recorded data were transcribed. Open coding was used to analyze the data. **Results:** Most physical, psychological and social consequences after a trauma were the same in all patients (n=20, mean 55y, mean ISS=23) irrespective of age or trauma severity. Early in the recovery process physical limitations, independency, pain, and anxiety dominated. Later, patients experienced problems with acceptance. Personality, patients' own expectations, a social network, and available medical and governmental facilities were related to QoL. According to the patients, the WHOQOL-BREF covered all concepts to measure QoL since the questions covered all reported consequences. Compared to the other patient groups, patients with traumatic brain injury reported more psychosocial consequences. Elderly patients reported few functional problems, they reported mainly difficulties on the activity and participation level. Quality of health care was considered an important aspect in perceived QoL, adequate aftercare was missed according to most patients. **Discussion and conclusion:** The impact of a trauma influences QoL in different health domains. The WHOQOL-BREF showed good face validity. **Clinical message:** Duration after injury plays an important role in experiencing QoL. Lack of appropriate aftercare indirectly influenced trauma patients' QoL.

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