

# Programme Overview DCRM 2019

## THURSDAY 7 NOVEMBER

08.30 – 10.00	<b>Registration of the participants</b>
10.00 – 10.10	<b>Opening</b>
10.10 – 10.40	<b>KEYNOTE LECTURE: Prof. Dale Corbett, FCAHS</b> <i>Stroke Recovery and Rehabilitation in Canada: The Canadian Partnership for Stroke Recovery Experience</i>
10.40 – 11.10	<b>KEYNOTE LECTURE: Marike van der Schaaf PhD</b> <i>The Post Intensive Care Syndrome, Right Care: what, when, and where?</i>
11.10 – 11.40	<b>KEYNOTE LECTURE: Prof. Wilco Achterberg MD and Prof. Anne Visser MD</b> <i>The Rehabilitation Landscape is changing; a call for collaboration?</i>
11.40 – 11.50	<b>Pitch presentations of the 11 Best Posters (plenary)</b>
11.50 – 12.55	<b>Poster walk and exhibition: Networking Lunch Break</b>
12.55 – 15.30	<b>Parallel Session A: Workshops</b> <b>A1.</b> How to implement, that is the real challenge! <b>A2.</b> Set out for future-directed rehabilitation medicine. The professional meets the patient: interprofessional learning and collaborative practice
12.55 – 13.55	<b>Parallel Session A: Free paper sessions</b> <b>A3.</b> <a href="#">Free paper session – brain injury / stroke and measurement</a> <b>A4.</b> <a href="#">Free paper session – brain injury / stroke and measurement</a> <b>A5.</b> <a href="#">Free paper session – diseases of the musculos &amp; arm/hand</a> <b>A6.</b> <a href="#">Free paper session – family and community</a> <b>A7.</b> <a href="#">Free paper session – children and young adults</a> <b>A8.</b> <a href="#">Free paper session – misscelaneous</a>
14.05 – 15.35	<b>Parallel Session B: Workshops and mini-symposia</b> <b>B3.</b> Rehabilitation Medicine: in the right place, at the right time. in a digital world <b>B4.</b> Personal Health Record in Rehabilitation: what is the added value for transmural rehabilitation care? <b>B5.</b> Extracorporeal shockwave therapy: a new treatment for spasticity <b>B6.</b> Ankle-foot orthoses: considerations and perspectives on the design and timing of provision <b>B7.</b> Big data in pain rehabilitation <b>B8.</b> How to maximize the placebo effect of rehabilitation
15.35 – 16.15	<b>Poster walk and exhibition: networking break</b>
16.15 – 17.45	<b>General Assembly NSRM</b>

## FRIDAY 8 NOVEMBER

07.30 – 08.30

**Registration of the participants**

08.30 – 10.00

### Parallel Session C: Workshops and mini-symposia

- C1.** Social media in rehabilitation: in the right place, at the right time
- C2.** Building an EPA-based training plan for residents in rehabilitation medicine: learning in the right context, at the right time
- C3.** Beweegziekenhuis - Exercise as a medicine in the hospital environment?!
- C4.** Clinical application of exercise testing in children with walking problems due to childhood onset disability
- C5.** Personalised rehabilitation medicine: how to get the right assistive device on the right patient at the right time
- C6.** Innovations and strategies to enhance physical activity in your rehabilitation centre
- C7.** Rehabilitation medicine: care in the right place, at the right time AND by the right person
- C8.** Permissive weight-bearing: the next step

10.00 – 10.40

**Coffee break and visiting commercial exhibition**

10.40 – 11.40

### Parallel Session D: Debate and PhD thesis session

- D1.** PhD thesis session: Presentations of the best PhD theses in the Netherlands
- D2.** Debate: 'Collaboration between geriatric and medical specialist rehabilitation care'

11.50 – 12.20

**KEYNOTE LECTURE: Martijn Klem**

*Autonomy and collaboration in rehabilitation care*

12.20 – 13.20

**Poster walk and exhibition: Networking Lunch Break**

13.20 – 14.50

### Parallel Session E: Workshops and mini-symposia

- E1.** To educate the future doctor in Rehabilitation Medicine: Fun and Facts!
- E2.** Setting meaningful goals in rehabilitation
- E3.** Strengthening the developmental perspective in pediatric rehabilitation care for youth with cerebral palsy (CP): implementing the PERRIN results
- E4.** Working in networks... How to?
- E5.** Manual wheelchair mobility: a continued future concern
- E6.** Spasticity treatment in the right place: time to concentrate care?
- E7.** Targeted offloading with rocker profiles
- E8.** Keep on training with ReVi! An e-health application to support individualized home-based aerobic training.

14.50 – 15.30

**Poster walk and exhibition: Networking Break**

15.30 – 15.40

**Awarding best PhD thesis, best presentation and best poster**

15.40 – 16.10

**KEYNOTE LECTURE: Esther Kruitwagen PhD**

*Keys to success in implementing remote monitoring to support multidisciplinary care: an e-health example of personalized ALS/MND care*

16.10 – 16.40

**KEYNOTE LECTURE: Prof. Niels Chavannes MD**

*What solutions does eHealth offer us in practice?*

16.45

**End of the congress**

## PROGRAMME DCRM 7 & 8 November 2019

### KEYNOTE LECTURES

#### Thursday 7 November 2019

1. Prof. Dale Corbett, FCAHS
2. Marike van der Schaaf, PhD
3. Prof. Anne Visser MD and Prof. Wilco Achterberg MD

#### Friday 8 November 2019

4. Martijn Klem MA
5. Esther Kruitwagen MD
6. Prof. Niels Chavannes MD

#### 1. Prof. Dale Corbett, FCAHS

##### **Stroke Recovery and Rehabilitation in Canada: The Canadian Partnership for Stroke Recovery Experience**

###### Biography

*Dale Corbett is Professor of Neurosciences at the University of Ottawa, Canada and Scientific Director of the Canadian Partnership for Stroke Recovery. Prior to his work in stroke recovery and rehabilitation, Professor Corbett did pioneering work on the protective effects of long duration hypothermia now used in cases of cardiac surgery and perinatal asphyxia. His most impactful discoveries concern the importance of early rehabilitation. He identified a time-limited "critical period" after stroke when the brain is most receptive to rehabilitation. His highly translational research has also revealed the potential of high intensity training in combination with environmental enrichment and exercise for achieving greater functional recovery. Professor Corbett has played a major role in advancing stroke recovery and rehabilitation research and training in Canada and on the international scene as a key contributor to the international Stroke Recovery and Rehabilitation Roundtable. His research excellence has been recognized through numerous awards including an Alfred P. Sloan Fellowship at Harvard University and a Senior Canada Research Chair in Stroke and Neuroplasticity. He was the first recipient of the Canadian Stroke Network's Paul Morley Mentorship award for his outstanding contributions in training the next generation of stroke researchers.*

#### 2. Marike van der Schaaf PhD

##### **The Post Intensive Care Syndrome, Right Care: what, when, and where?**

###### Summary

The advancements in critical care medicine result in lower mortality rates and thus a growing population of survivors of critical illness. As a result, each year, millions of people are discharged back to the community. However, many intensive care unit (ICU) survivors experience physical and cognitive impairments, and mental health problems after discharge from the ICU, known as post-intensive care syndrome (PICS). These impairments are associated with long-lasting restrictions in daily functioning, participation problems and reduced health-related quality of life. An admission to an ICU can also negatively affect family members, referred to as PICS- Family.

The recognition of long-term consequences for ICU survivors and their families is a growing concern. In addition to the ongoing impact on patients, post-ICU impairments are a major burden for families and for society, with increased healthcare utilization and high rates of institutionalization and increased risk of job loss. With respect to the high prevalence of complex and severe impairments and functional limitations, ICU survivors and their families should be considered as an important target population for interdisciplinary rehabilitation care. This presentation will provide an overview of the consequences of critical illness for functioning and its risk factors. Furthermore, the current evidence regarding strategies to decrease PICS in the acute and in the chronic phase will be discussed.

### Biography

*Marika van der Schaaf (PT PhD) is Associate Professor Acute Care Rehabilitation and epidemiologist / physiotherapist at the Department of Rehabilitation Medicine, Amsterdam UMC (AMC) and the Amsterdam University of Applied Sciences. As a physiotherapist she covered the spectrum of physiotherapy from acute and critical care through outpatient care. She completed a clinical epidemiologist Evidence Based Practice Master of Science (Cum Laude, 2004) and her PhD on Functional Recovery after Critical Illness (2009), both with the University of Amsterdam. Her research theme focusses on the development of rehabilitation interventions for frail hospitalized patients in the transitions of care during and after hospital stay. In collaboration with researchers, health professionals, lecturers and patients, new developed knowledge is actively implemented into health care and education.*

## **3. Prof. Anne Visser MD & prof. Wilco Achterberg MD**

### **The Rehabilitation Landscape is changing; a call for collaboration?**

#### Summary

More and more people need rehabilitation care due to a growing population of elderly, with more than one chronic illness leading to functional limitations, and because more and more people have to recover after an (sub)acute decline in function, often associated with an hospital admission. Health insurers and policy makers are concerned about the growth of rehabilitation care, and future costs. One of the strategies of policy makers is to try to make very distinct definitions of care products that may overlap- Medical Specialist Rehabilitation, Geriatric Rehabilitation, and temporary/respite care, also known as 'Eerste Lijns Verblijf' (ELV). Interestingly, other health care systems in the world have to take care of the same patients, but have other definitions of their products. In the Netherlands, the Medical Specialist Rehabilitation mainly provides outpatient care and focuses on achieving participation goals, in a population that is usually not very frail, and not very old. Geriatric Rehabilitation focuses on older and more vulnerable patients, with usually less complex participation goals. In theory these two care products should be adjacent and complementary, but there is a large regional variety in collaboration practice between Geriatric and Medical Specialist Rehabilitation in the Netherlands, and not in all regions this is optimal. In this lecture, we will try to specify what Geriatric Rehabilitation is, based on a recent European consensus study. Then, we will use that as the basis for how this defines the collaboration opportunities for the Medical Specialist Rehabilitation in care, research and training.

#### Biography

*Prof. Anne Visser-Meily is head of department Rehabilitation, Physical Therapy Sciences and Sport, UMC Utrecht and head of the Center of Excellence for Rehabilitation Research, the research- and innovation center for rehabilitation of Brain Center, UMC Utrecht and De Hoogstraat Rehabilitation. The research focuses on ways to support autonomy, self-management and participation of patients and relatives with Stroke, ALS and SMA, Brain based Developmental Disabilities (CP) and Spinal Cord Injury, with a specific focus on the role of personal and environmental factors, cognition, and physical health (physical activity, sleep and nutrition). Patients and relatives are involved in all aspects of all research. [www.kcrutrecht.nl](http://www.kcrutrecht.nl); @AnneVisserMeily*  
*Prof. Wilco Achterberg is an elderly care physician, and a professor of elderly care medicine at Leiden University Medical Center. He leads a research team in geriatric rehabilitation, is part of the Special Interest Group Geriatric Rehabilitation of the EUGMS, and part of the EUGMS geriatric rehabilitation Consensus team.*

## **4. Martijn Klem MSc**

### **Between autonomy and cooperation in rehabilitation care**

A physician who independently diagnoses and designs the right therapy is one of the fundamentals under our rehabilitation care. This autonomy is under siege. Openly or manifestly, health insurers, industries and managers exert pressure with their focus on efficiency, their shareholders and their financial incentives. It would be wrong, however, to defend 'autonomy' at all costs or to confuse it with 'stand-alone practice'. Apart from their own expertise, rehabilitation physicians can benefit from the evidence and practice-based conclusions of their fellow physicians, of paramedics, patients and

researchers. There is a world to win here. It takes too long before proven methods are being implemented at each rehabilitation centre. When we observe differences in treatments to similar patients, there is a need to compare these therapies to those of colleagues. When we observe that guidelines are insufficiently followed, there is a need to discuss how we can improve implementation. When we observe advantages of both specialisation and local care, there is a need to openly discuss when and how we cooperate in delivering the right care at the right place.

This keynote lecture is a plea for commitment to structural cooperation and transparency in rehabilitation care. We could significantly improve the quality of our care, if physicians dare to cooperate. This plea is illustrated through the trial and error process of CP-Net. This national network unites physicians, paramedics, patients and researchers in order to improve care and support for people with cerebral palsy. This keynote lecture shows this struggle in cooperation by highlighting its bottom-up approach and the development of instruments like the knowledge broker network, the CP register and the tripartite research agenda.

#### Biography

*Martijn Klem MSc is CEO of Revalidatie Nederland, the Association of Rehabilitation Providers in the Netherlands. Martijn is one of the founders of CP-Net, the network of patients, professionals and researchers that aims to ensure state of the art care to everyone with cerebral palsy in the Netherlands. Before joining Revalidatie Nederland in 2018, Martijn was CEO of BOSK, the Association of People with Congenital Physical Disabilities. He has published numerous articles on participation in research and rehabilitation care.*

## 5. Esther Kruitwagen MD

### **Keys to success in implementing remote monitoring to support multidisciplinary care: an e-health example of personalized ALS/MND care**

#### Summary

EHealth can stimulate personalized care by optimizing the timing and content of care and patient participation. Keys to success of (a) successful implementation of eHealth will be presented. The current model of multidisciplinary ALS care presents unresolved access issues for patients with ALS and comes with a considerable burden for these patients and their caregivers. A tailored eHealth care process was developed for ALS care which consists of an interactive eHealth application for self-monitoring, automated alerts, personalized feedback and tailored planning of appointments. ALS patients referred to the multidisciplinary ALS care team of the academic hospital in Utrecht, were invited to use the tailored eHealth care process. This innovative eHealth care process is appreciated by patients as well as professionals and provides patients increased control over their care and professionals efficient consultations. Telemonitoring (ALS Thuismeten en Coachen) is now part of daily care for ALS, PSMA and PLS patients in the UMCU. Analysing monitoring data creates a longitudinal database fit for research purposes. Additionally, a social cost-benefit analysis showed that it pays to invest in this project. Next step now is nationwide implementation of ALS home-monitoring and coaching.

In rehabilitation medicine, we must take more advantage of technology, eg telemonitoring, to identify and implement solutions to improve care.

#### Biography

*Esther Kruitwagen-van Reenen works as a physician Rehabilitation Medicine at the Department of Rehabilitation, Physical Therapy Science & Sports of the University Hospital Utrecht. Specific topics of attention in her work are neuromuscular diseases, in particular ALS and SMA. She is involved in several research- and innovative projects to improve daily care for ALS and SMA. Among which the implementation of the eHealth application 'Thuismeten en Coachen'. In the center of Excellence for ALS care, she is coördinator of the 'Zorgnetwork project' and member of the organizing committee of the yearly held multidisciplinary MND- congress. As a medical advisor of the patient association, she gives lectures on rehabilitation care for patients and professionals. She's involved in the development of several Guidelines for rehabilitation care (Duchenne, ALS). Additionally she's conducting a doctorate research into Participation and Quality of Life of patients with motor neuron disease.*

## 6. Prof. Niels Chavannes MD

### What solutions does eHealth offer us in practice?

#### Summary

eHealth has been hyped a lot, and there is a plethora of applications available, but a sound scientific approach towards eHealth is often lacking. The National eHealth Living Lab ([www.nell.eu](http://www.nell.eu)) is the (inter)national knowledge platform that brings together scientists, patients, healthcare providers, regulatory bodies and entrepreneurs, aimed at revealing the best solutions in practice. Over 120 eHealth projects are currently running on this platform, and this presentation will provide you with a flavor of what's on offer, good and bad examples, and a framework for implementation of eHealth applications that do work.

#### Biography

*Prof. Dr. Niels H. Chavannes MD, PhD, graduated in Medicine at Maastricht University in 1998. He combined his specialization as a Family Physician (2003) with several diagnostic and therapeutic studies in primary care, resulting in his 2005 PhD thesis: "Tracking and treating COPD in Primary Care: An integrated approach to diagnosis and therapy" at the CAPHRI Research Institute of Maastricht University, the Netherlands. In Rotterdam he was involved in setting up an innovative multidisciplinary health care center in a deprived area since 2003, and worked there as a Family Physician for four years. In 2006 his team received the National Public Health Stimulation Award (2006) for the Kroonluchter Project, implementing a highly successful integrated COPD management program. In 2008, this was followed by two years as a Consultant Family Physician at United Family Hospital in Shanghai, China, combined with an Assistant Professorship at Leiden University Medical Center. In 2010 he returned to the Netherlands as an Associate Professor, coordinating several (inter)national clinical research projects, and teaching on chronic disease management, eHealth and mHealth applicability, therapy adherence, and smoking cessation strategies. In 2015 he was appointed as a Full Professor of Primary Care Medicine, Strategic Chair of eHealth Applications in Disease Management, and in 2016 he became Head of Research at the Department of Public Health and Primary Care, Leiden University Medical Center. In March 2018 he established the National eHealth Living Lab, that brings together patients, healthcare providers, designers, programmers and researchers in a user-centered design environment to co-create better tailored eHealth applications on national scale. He enjoys working as a part-time Family Physician in his residence Zeist, the Netherlands, and is the Vice-Chair of the Dutch Asthma and COPD Advisory Group (CAHAG) and the National Advisor of the Dutch Action Program on Chronic Lung Diseases of the Lung Alliance Netherlands (LAN).*

*He published over 195 peer-reviewed articles on topics like eHealth and mHealth, adherence, rehabilitation, asthma, COPD, smoking cessation, self-management and disease management programs in primary care. He contributed to 17 books as first author and 6 books as second or last author. He has been a member of over 60 different committees and raised over € 30 million in funding over the past 15 years.*

## PARALLEL SESSION A - FREE PAPER SESSIONS

Thursday 12.55-13.55

### FREE PAPER SESSION A3: brain injury / stroke and measurement

- O1. Patients' self-reported versus objective clinical measures of improvement of upper limb capacity after stroke: Are they measuring the same? - Eline van Lieshout
- O2. Cognitive complaints and underlying cognitive impairments as measured with a digital neuropsychological assessment - Lauriane Spreij
- O3. Intensity of daily physical activity - a key component to improve physical performance after minor stroke - Hanneke Braakhuis
- O4. Minor stroke, serious balance problems? - Jolanda Roelofs

### FREE PAPER SESSION A4: brain injury / stroke and treatment

- O5. Cognitive complaints during daily-life activities in brain tumour patients; toward better understanding of complaints and cognition functions - Isabel Gosselt
- O6. One-year costs of medical specialist stroke rehabilitation - Winke van Meijeren - Pont
- O7. The effect of providing ankle-foot orthoses on falls after sub-acute stroke: results from a randomized controlled trial - Corien Nikamp
- O8. Perceived barriers and facilitators for gait-related participation in people after stroke: from a patients' perspective - Ilona de Rooij

### FREE PAPER SESSION A5: diseases of the musculos & arm/hand

- O9. Development of the AAQ-CAT: An Innovative Computer-Adaptive Tool for the Assessment of Physical Ability - Leo Roorda
- O10. A newly designed shoulder orthosis for patients with glenohumeral subluxation: a clinical evaluation study - Willemijn Verloop
- O11. User-relevant factors determining prosthesis choice in persons with major unilateral upper limb defects: a synthesis of qualitative evidence - Nienke Kerver
- O12. A quick scan with PROMIS® profile computerized adaptive tests supported the definition of patients with complex problems - Leo Roorda

### FREE PAPER SESSION A6: family and community

- O13. Self-efficacy predicts personal and family adjustment among persons with spinal cord injury or acquired brain injury and their significant others: A dyadic approach - Eline Scholten
- O14. Is diagnosis a predictor for the level of community participation for patients after rehabilitation? - Tanja Mol
- O15. Family functioning in patients with acquired brain injury and their partners - Vincent Cox
- O16. Measures used to assess impact of providing informal care among caregivers of persons with stroke, spinal cord injury or amputation: A systematic review - Eline Scholten

### FREE PAPER SESSION A7: children and young adults

- O17. The effect of intrathecal baclofen in dyskinetic cerebral palsy: the results of the IDYS trial - Laura Bonouvrie
- O18. Marfan syndrome in adolescence: adolescents' perspectives on (physical) functioning, disability, contextual factors and support needs - Jessica Warmink-Kavelaars
- O19. Compensation strategies used to move a glass to the mouth in Duchenne muscular dystrophy - Karin Naarding
- O20. Family impact in children and young adults with acquired brain injury; outcomes in a rehabilitation cohort - Menno van der Holst

### FREE PAPER SESSION A8: miscellaneous

- O21. The implementation of and satisfaction with an eRehabilitation intervention in the rehabilitation setting after stroke - Berber Brouns
- O22. Young adults with transversal upper limb reduction deficiency: the role of the rehabilitation center in supporting transition to adulthood - Kim Huurneman
- O23. Discussing Personalised Prognosis in Amyotrophic Lateral Sclerosis: Development of a Communication Guide - Remko van Eenennaam
- O24. Fatigue, participation and quality of life in adolescents and young adults with acquired brain injury in an outpatient rehabilitation cohort - Frederike van Markus-Doornbosch

## FREE PAPER SESSION A3

### O-1

#### **Patients' self-reported versus objective clinical measures of improvement of upper limb capacity after stroke: Are they measuring the same?**

E.C.C. Van Lieshout<sup>1</sup>, J.M.A. Visser-Meily<sup>2,3,4</sup>, R.H.M. Nijland<sup>5</sup>, R.M. Dijkhuizen<sup>1</sup>, G. Kwakkel<sup>5,6</sup>  
<sup>1</sup>UMC Utrecht, Utrecht, Netherlands, <sup>2</sup>Center of Excellence in Rehabilitation Medicine, Utrecht, Netherlands, <sup>3</sup>University Medical Center Utrecht, Department Of Rehabilitation, Physical Therapy Science & Sports, UMC Utrecht Brain Center, Utrecht, Netherlands, <sup>4</sup>University Medical Center Utrecht, Center Of Excellence For Rehabilitation Medicine, Utrecht, Netherlands, <sup>5</sup>Reade, Neurorehabilitation, Amsterdam, Netherlands, <sup>6</sup>Northwestern University, Evanston, United States of America

**Introduction:** Recovery of the paretic arm after stroke can be measured by objective and self-reported measures.

**Objective:** Determine whether correspondence (match) or non-correspondence (mismatch) between outcomes on objective and self-reported improvements of upper limb capacity is significantly different  $\leq 3$  and  $\geq 3$  months post-stroke, and dependent on timing of assessment  $\leq 3$  when compared to  $\geq 3$  months post-stroke.

**Patients:** Stroke patients with an upper limb paresis.

**Methods:** 159 stroke patients were included, and paretic arm function was measured with objective (Action Research Arm Test; ARAT) and self-reported measures (Motor Activity Log Quality of Movement; MAL-QOM and Stroke Impact Scale Hand; SIS-Hand) at baseline, 12, and 26 weeks post-stroke. Contingency tables and Fisher's exact test were used to define the proportion matches to mismatches. The proportion matches to mismatches  $\leq 3$  and  $\geq 3$  months post-stroke were compared using McNemar's test.

**Results:** There were significantly more matches than mismatches between the ARAT versus MAL-QOM and SIS-Hand for the different time-windows post-stroke (all  $p < 0.01$ ). The proportion matches to mismatches was not significantly different  $\leq 3$  months versus  $\geq 3$  months post-stroke for the ARAT versus MAL-QOM and SIS-Hand (all  $p > 0.05$ ). Patients tend to be more pessimistic in their self-reports  $\geq 3$  months compared to  $\leq 3$  months post-stroke.

**Discussion and conclusions:** Patients are able to recognize improvements in upper limb capacity during the first six months post-stroke. However, it is recommended to use a combination of objective and self-reported measures in order to recognize possible mismatches.

**Clinical message:** Different rehabilitation strategies might be needed for patients who tend to over- and underestimate their performance.

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### O-2

#### **Cognitive complaints and underlying cognitive impairments as measured with a digital neuropsychological assessment**

L.A. Spreij<sup>1</sup>, I.K. Gosselt<sup>1</sup>, J.M.A. Visser-Meily<sup>1,2</sup>, T.C.W. Nijboer<sup>1,3</sup>  
<sup>1</sup>University Medical Center Utrecht, Center Of Excellence For Rehabilitation Medicine, Utrecht, Netherlands, <sup>2</sup>University Medical Center Utrecht, Department Of Rehabilitation, Utrecht, Netherlands, <sup>3</sup>Helmholtz Institute, Utrecht University, Department Of Experimental Psychology, Utrecht, Netherlands

**Introduction:** A paper-and-pencil neuropsychological assessment (NPA) often fails to capture difficulties patients encounter in daily life. A digital NPA allows the development of novel outcome measures (e.g., fluctuations in performance) that are possibly more related to daily life than the traditional outcome measures (e.g., accuracy, total time).

**Objective:** We assessed the relation between cognitive complaints (as measured with the Cognitive Complaints - Participation [CoCo-P]) and cognitive impairments (as measured with a paper-and-pencil NPA and a digital NPA).

**Patients:** We recruited 44 outpatients with acquired brain injury.

**Methods:** Patients received either a paper-and-pencil NPA or a digital NPA. The CoCo-P was administered in all patients.

**Results:** The majority of patients reported complaints regarding memory (89%), attention (98%), and executive functions (93%), but only a small percentage showed impairments regarding memory (33%), attention (28%), and executive function (12%) based on the traditional outcome measures. We found no relation between the complaints and the traditional outcomes measures. Preliminary results revealed that patients showed time-based fluctuations in their performance (as measured with novel outcome measures in the digital NPA). Analyses are still ongoing.

**Discussion and conclusions:** Traditional outcome measures are not sensitive enough to capture cognitive difficulties in daily life. Novel outcome measures that are implemented in a digital NPA provide additional information about time-based fluctuations in performance causing an inconsistent working speed and/or accuracy.

**Clinical message:** Rehabilitation aims to optimize functional independence and participation. A NPA examines the cognitive impairments that could hamper these goals. A digital NPA can provide more detailed information. Future research requires the development of normative data.

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O-3

### **Intensity of daily physical activity - a key component to improve physical performance after minor stroke**

H.E.M. Braakhuis<sup>1,2</sup>, J.M.B. Roelofs<sup>3</sup>, M.A.M. Berger<sup>4</sup>, G.M. Ribbers<sup>1</sup>, V. Weerdesteyn<sup>3</sup>, J.B.J. Bussmann<sup>1</sup>

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**Introduction:** Even after minor stroke, an inactive lifestyle is often observed. However, it has been shown that one's potential or capacity to perform an active lifestyle (further described as physical performance) does not automatically lead to matching daily physical activity (DPA) levels. DPA can be considered as multilayered construct with different determinants. Insight in these determinants in relation to potential physical performance may provide valuable information to specify advices to improve lifestyle.

**Objective:** To identify determinants of daily physical activity and explore their relation with physical performance.

**Patients:** 69 individuals (61% male) >6 months post minor stroke and  $\geq 24$  on the Fugl-Meyer Assessment score for lower extremity.

**Methods:** An Activ8 physical activity monitor was worn during 7 days consecutive. Counts per minute during upright activities (CPM<sub>ua</sub>), number of active bouts, % of wear time being active and % of wear time in sport activities were calculated. Physical performance was determined by the 10-meter-walking-test (10MWT), Timed-up-&-Go and the Mini-Balance-Evaluation-Systems-Test. Multivariate linear regression modelling adjusting for age, sex and BMI, with PA outcomes as independent variables and physical performance as dependent was performed in Rstudio.

**Results:** Based on standardized estimates, CPM<sub>ua</sub> was the most positively contributing factor to performance outcomes. The only significant predictor in all models was CPM<sub>ua</sub> for the 10MWT ( $p=0.015$ ).

**Discussion and conclusions:** Intensity of daily physical activity (CPM<sub>ua</sub>), was the most important determinant in the relation with physical performance.

**Clinical message:** Future development of advices to improve lifestyle after minor stroke should consider intensity of DPA as an essential component.

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O-4

#### Minor stroke, serious balance problems?

J.M.B. Roelofs<sup>1</sup>, I.M. Schut<sup>2</sup>, A.C.M. Huisinga<sup>3</sup>, S. Beurskens<sup>1</sup>, A.C. Schouten<sup>2</sup>, A.C.H. Geurts<sup>1,4</sup>, V. Weerdesteyn<sup>1,4</sup>

<sup>1</sup>Radboud University Medical Center, Nijmegen, Netherlands, <sup>2</sup>Delft University of Technology, Delft, Netherlands, <sup>3</sup>Rehabilitation Center Klimmendaal, Arnhem, Netherlands, <sup>4</sup>Sint Maartenskliniek Research, Ubbergen, Netherlands

**Introduction:** Recent findings suggest that even people after minor stroke may have persistent balance impairments. This deserves further examination because poor balance is a key risk factor for falls and a determinant of physical activity in daily life.

**Objective:** To test our hypothesis that people >6 months after a minor stroke have an elevated fall risk, show persistent balance impairments, and are less physically active than their healthy counterparts.

**Patients:** Sixty-four persons with a chronic minor stroke ( $\geq 24$  points on the Fugl-Meyer Assessment lower-extremity) and 50 healthy controls.

**Methods:** Falls were prospectively registered for 6 months using fall calendars and daily physical activity was assessed for one week using the Activ8 activity monitor. The mini-Balance Evaluation Systems Test (mini-BESTest, range:0-28) was conducted to assess dynamic balance control.

**Results:** Fall rates in minor stroke participants were higher compared to controls (1.1 vs. 0.52 falls per person-year,  $p=0.023$ ). The mini-BESTest demonstrated impaired balance control in the vast majority of minor stroke participants (87% vs. 40% in controls; median scores 24.5 vs. 27.0 points,  $p<0.001$ ). The duration of daily physical activity was not different between groups ( $p=0.667$ ), but total intensity of physical activity was 6% lower in minor stroke participants ( $p=0.030$ ).

**Discussion and conclusions:** Individuals in the chronic phase after minor stroke who present with (almost) complete clinical recovery of leg motor impairments still show substantial balance problems and fall relatively frequently. These results may point at an important unmet clinical need in this population.

**Clinical message:** Minor stroke individuals may be easily overestimated with regard to fall risk, physical activity and balance.

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## FREE PAPER SESSION A4

O-5

### **Cognitive complaints during daily-life activities in brain tumour patients; toward better understanding of complaints and cognition functions**

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**Introduction:** Brain tumour patients often report cognitive complaints. It is unknown whether these complaints are restricted to specific daily-life situations.

**Objective:** We assessed cognitive complaints across different cognitive domains (memory, attention, executive), during daily-life activities (e.g., work/study), using the *Cognitive Complaints–Participation inventory* (CoCo-P). Next, we examined the relation between these complaints and general cognitive functioning (i.e. Montreal Cognitive Assessment (MoCA)).

**Patients:** We recruited brain tumour patients receiving outpatient rehabilitation at the University Medical Center Utrecht, the Netherlands.

**Methods:** The CoCo-P and MoCA were administered. Response options for the CoCo-P ranged from 0 (independently without effort) to 3 (not possible). Responses were subdivided into: %restrictions and %incapable. The relation between cognitive complaints (total score CoCo-P) and general cognitive functioning (total score MoCA) was examined using Pearson's correlation.

**Results:** So far, we included 26 patients (MoCA: 10 patients scored <cut-off). All (100%) patients experienced restrictions regarding social contacts and work/education; of which 60% was incapable to work/study. Additionally, 75-77% experienced restrictions regarding leisure activities and family life, and 70-74% regarding (grocery) shopping and driving a car. These complaints could not be clarified by underlying cognitive deficits, as no significant correlation was found between the CoCo-P and MoCA.

**Discussion and conclusions:** Brain tumour patients receiving outpatient rehabilitation, often experience cognitive complaints in work, social contacts, leisure activities, (grocery) shopping and driving.

**Clinical message:** Neuropsychological screeners are not sensitive, complex, and ecologically valid enough to capture complaints in dynamic, interactive, multi-task daily-life situations. As expected, cognitive complaints should be assessed complementary to general cognitive functioning.

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O-6

### **One-year costs of medical specialist stroke rehabilitation**

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**Introduction:** Rehabilitation is the main contributor to the costs of post stroke care. Little research has been done evaluating the costs of rehabilitation in the first year.

**Objective:** Estimate one-year costs of rehabilitation among stroke patients treated in a medical specialist rehabilitation facility (RF).

**Patients:** Consecutive stroke patients treated as inpatient or outpatient in an RF.

**Methods:** Costs of hours of therapy were extracted from the RF's administration system. Costs were calculated 1) from start to discharge (inpatient only), 2) from discharge to 6 months (inpatient and outpatient), and 3) from 6 to 12 months (inpatient and outpatient).

**Results:** 370 stroke patients completed the 12-month period. Of them 216 (58.4%) were men, mean age 59,7 (SD 12,3) years. For inpatients (n=289 (78.1%)), the median length of stay was 6.3 weeks (range 4.4-9.3). Total costs of rehabilitation amounted to 20.032,79 Euro (range 12.574,73-30.810,58) and 7.294,75 Euro (range 2.979,57-12.264,29) for inpatients and outpatients, respectively. Most costs were made in the first period for inpatients (median 14.440,25 Euro, range 9.584,36-23.100,69) and in the second period for outpatients (median 6.434,85 Euro, range 2.803,37-10.451,23).

**Discussion and conclusions:** Most costs of stroke rehabilitation were made in the first 6 months after stroke for inpatients and outpatients. However, absenteeism, out of pocket costs and healthcare use outside the RF should also be included when estimating one-year costs from a societal perspective.

**Clinical message:** A recommendation for future research is to investigate the value of rehabilitation for stroke patients expressed in utilities achieved per Euro spent.

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O-7

### **The effect of providing ankle-foot orthoses on falls after sub-acute stroke: results from a randomized controlled trial**

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**Introduction:** Ankle-foot orthoses (AFOs) are often provided to improve walking post-stroke, but effects on falls are unknown.

**Objective:** To study the effects of AFO-provision on the occurrence and circumstances of falls in sub-acute stroke.

**Patients:** Thirty-three unilateral hemiparetic patients with indication for AFO-use, maximal 6 weeks post-stroke.

**Methods:** A randomized controlled trial, assigning subjects to early (study-week 1) or delayed AFO-provision (study-week 9). Falls and fall-circumstances were registered using weekly diaries. Balance and walking ability-scores were obtained bi-weekly. Results of week 1-8 were compared (early group provided; delayed group not yet provided with AFOs).

**Results:** Falls occurred significantly more often in the early group (11x), compared to the delayed group (4x) with an Incidence Rate of 0.69 (early) and 0.24 (delayed); Incidence Rate Ratio=2.92;  $p=0.039$ . After early-provision, most falls occurred during transfers (36.4%) and standing

(27.3%). Despite AFO-provision, 63.6% of falls occurred without AFO and >90% of falls occurred when subjects had no independent walking ability.

**Discussion and conclusions:** Early post-stroke, falls occurred significantly more often in subjects provided with AFOs, compared to subjects not yet provided with AFOs. Most falls occurred without wearing AFO, despite that they were provided. The majority of these incidents occurred during activities related to bed, toilet and shower. At the same time, subjects had no independent walking ability and low balance levels.

**Clinical message:** Careful instructions to patients and relatives concerning AFO-use early after stroke are important, including which activities can and cannot be performed independently. Whether the AFO is used or not in these activities, is of considerable importance when instructing patients.

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O-8

### **Perceived barriers and facilitators for gait-related participation in people after stroke: from a patients' perspective**

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**Introduction:** An important focus of post-stroke physical therapy is to improve walking and walking capacity. However, many people after stroke experience difficulties with gait-related participation which includes more than walking capacity alone. Gait-related participation involves walking with a participation goal and requires to, for example, deal with changes in the environment during walking and perform dual tasks.

**Objective:** To explore barriers and facilitators for gait-related participation from the perspective of people after stroke. This knowledge can contribute to the development of effective interventions to improve gait-related participation.

**Patients:** Community living people within six months after stroke were recruited from the ViRTAS study.

**Methods:** Semi-structured interviews were conducted to investigate how people after stroke experience gait-related participation. Audio-recorded interviews were transcribed, anonymized and analyzed thematically using the Framework Method. Barriers and facilitators were categorized according to the International Classification of Functioning, Disability and Health (ICF) framework.

**Results:** Twenty-one people after stroke participated. Median age was 65 years and median time since stroke 16 weeks. Barriers and facilitators were reported in all components of the ICF framework.

**Discussion and conclusions:** People after stroke who were physically able to walk independently, still described multiple barriers to gait-related participation. Interventions to improve gait-related participation should address a combination of physical walking capacity, cognitive functioning, activity and participation restrictions, and personal and environmental factors.

**Clinical message:** In addition to walking capacity, physical therapy interventions should focus on improving cognitive functioning and identifying personal and environmental factors such as motivation and family support to improve gait-related participation.

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## FREE PAPER SESSION A5

O-9

### Development of the AAQ-CAT: An Innovative Computer-Adaptive Tool for the Assessment of Physical Ability

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**Introduction:** The Animated Activity Questionnaire (AAQ) is a computer-based tool for the almost non-verbal assessment of physical ability. Each of the AAQ items consists of several videos of an animated person performing a basic daily activity with different levels of difficulty. To answer an item, patients choose the animation that best matches their own ability level. To date, the AAQ has not been used as a computer-adaptive test (CAT).

**Objective:** To develop and evaluate an AAQ-based CAT.

**Patients:** (n=1136) with hip/knee osteoarthritis from Denmark, France, The Netherlands, Norway, Spain, and the UK.

**Methods:** Participants responded to all 17 items of the AAQ. Unidimensionality and country-related differential item functioning (DIF) were investigated. To establish item parameters for the CAT, a graded response model (GRM) was estimated. To investigate the psychometric performance of a CAT based on the AAQ items, post-hoc simulations were conducted (stopping criterion: maximum standard error<0.3).

**Results:** Unidimensionality of the AAQ measure was supported (CFI=0.96, TLI=0.95, SRMR=0.074). Country-related DIF was not apparent. Performing post-hoc simulated CATs, the median test length was 5 items (mean=6.7) and even lower in patients with low functional levels. The correlation between CAT scores and scores based on all AAQ items was high (Pearson's  $r=0.97$ ).

**Discussion and conclusions:** The AAQ-CAT measures physical ability with lower respondent burden but similar precision compared to the full AAQ measure.

**Clinical message:** The AAQ-CAT is an innovative and efficient tool for the assessment of physical ability in patients with hip/knee osteoarthritis from various European countries.

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O-10

### A newly designed shoulder orthosis for patients with glenohumeral subluxation: a clinical evaluation study

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**Introduction:** Shoulder complaints from glenohumeral subluxation is a common problem and limits patients in function and activities. Providing an orthosis is one of the treatment options.

**Objective:** To assess the usability, clinical benefits and disadvantages of a new shoulder orthosis (Roessingh Omo Support, ROS).

**Patients:** All patients over eighteen years who received ROS in Roessingh, Centre for Rehabilitation, between January 2016 – December 2018 were invited.

**Methods:** Retrospective evaluation study. Medical information about patient characteristics was collected from medical files. Three questionnaires were sent to the patient. Two copies of the 'Shoulder Rating Questionnaire' (SRQ, max 100 points) to evaluate before and during use. One self-developed orthosis usability questionnaire.

**Results:** 55 orthoses were prescribed. 29 patients (35 orthoses) admitted the study. Neuralgic amyotrophy was the most common diagnosis (65.5%). The SRQ (before usage) had a mean of 34.9 (SD 12.6) and the SRQ (during usage) 44.3 (SD 15.0). The paired t-test showed a significant change of 9.4 (SD 11.2). The most common goal was less pain (71.4%). In 69.0% of the patients pain complaints improved. 69.0% is still using the orthosis. The mean rate for satisfaction is 7.1 (SD 1.4).

**Discussion and conclusions:** This study shows a significant improvement in functioning (SRQ), decrease of pain and a high rate of satisfaction although the individual experiences of the patients are very variable. The design of the ROS may need some adjustments to improve comfort.

**Clinical message:** To our knowledge, this is one of the few studies that investigate the clinical effect of a shoulder orthosis. So this article provides an insight.

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## O-11

### **User-relevant factors determining prosthesis choice in persons with major unilateral upper limb defects: a synthesis of qualitative evidence**

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**Objective:** To identify user opinions on factors determining the prosthesis choice of persons with major unilateral upper limb defects (ULD) in order to get insight into variables that should be considered to reduce prosthesis rejection rates.

**Search strategy:** A qualitative evidence synthesis using a 'best-fit framework' approach was applied. Two search strings were composed using the SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type) strategy. PubMed, Cochrane Library, EMBASE, Cinahl and PsychInfo were searched.

**Selection of articles:** Studies were included if they concerned adults with major ULD experienced in using commercially available upper limb prostheses; focused on upper limb prosthesis users' opinions; were published in English between 2006 and 2019; a full article was retrievable and contained qualitative content. Out of 6247 articles, 19 studies were included.

**Optional: Evaluation of articles and results:** Study quality was evaluated using the Critical Appraisal Skills Programme (CASP) guidelines. All relevant text under the heading 'results' of the included studies was extracted and entered into ATLAS.ti software. This data was coded using the a-priori framework and, if applicable, new (sub-)themes were added. *Results:* Appearance, functionality, reliability and comfort were most mentioned factors that influenced the prosthesis choice. However, the huge amount of factors mentioned suggest that many different personal preferences play a role in the choice for a prosthesis.

**Conclusion:** Personal preferences when choosing a prosthesis vary greatly and should therefore be determined for every new prosthesis choice. This review provides a complete overview of user-relevant factors that can be helpful to identify these personal preferences.

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## O-12

### **A quick scan with PROMIS® profile computerized adaptive tests supported the definition of patients with complex problems**

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**Introduction:** Multidisciplinary rehabilitation treatment is intended for patients with complex problems. However, what are patients with complex problems?

**Objective:** To apply the PROMIS® profile as computerized adaptive tests (CATs) to define patients with complex problems.

**Patients:** with arthritis referred to a multidisciplinary rehabilitation team of a secondary outpatient center for rehabilitation and rheumatology.

**Methods:** Patients, undergoing the multidisciplinary team intake procedure, completed CAT-versions of seven PROMIS profile domains including the PROMIS Upper Extremity domain. PROMIS T-scores were calculated for which 50 represents the average score of the general Dutch (Anxiety and Depression) or US (other domains) population, with a SD of 10, and higher scores indicating more of the domain assessed. Patients with complex problems were defined as having  $\geq 1$  T-score indicating severe problems ( $\leq 30$  for positively-worded domains, e.g., physical functioning, and  $\geq 70$  for negatively-worded domains, e.g., anxiety, respectively),  $\geq 2$  T-scores indicating moderate-to-severe problems ( $\leq 35$  and  $\geq 65$ , respectively), or  $\geq 3$  T-scores indicating moderate problems ( $\leq 40$  and  $\geq 60$ , respectively).

**Results:** A total of 98 persons (28.6% male; mean $\pm$ SD age 48.8 $\pm$ 15.7y., pain intensity [range 0-10] 6.0 $\pm$ 1.8 and DAS-44 4.2 $\pm$ 1.2) participated. Mean $\pm$ SD PROMIS T-scores were: Physical Functioning, 34.7 $\pm$ 9.0; Anxiety, 60.0 $\pm$ 6.6; Depression, 54.4 $\pm$ 12.3; Fatigue, 61.1 $\pm$ 8.1; Sleep Disturbance, 56.4 $\pm$ 9.4; Ability to Participate, 40.5 $\pm$ 8.9; Pain Interference, 62.3 $\pm$ 11.8; and, Upper Extremity, 30.0 $\pm$ 8.0. Eighty two out of 98 patients (83,4%) were categorized as complex.

**Discussion and conclusions:** A quick scan with PROMIS profile CATs supported the definition of patients with arthritis and complex problems.

**Clinical message:** A quick scan with key PROMIS CATs may be supportive to define patients with complex problems.

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## FREE PAPER SESSION A6

## O-13

### **Self-efficacy predicts personal and family adjustment among persons with spinal cord injury or acquired brain injury and their significant others: A dyadic approach**

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**Introduction:** Family members interact and therefore a dyadic perspective is needed to understand the consequences of onset of spinal cord injury (SCI) or acquired brain injury (ABI), on personal and family adjustment.

**Objective:** To test the hypothesis that higher levels of self-efficacy among both persons with SCI/ABI and their significant others, measured shortly after admission to a rehabilitation centre, predict better personal and family adjustment six months after clinical discharge.

**Patients:** Dyads of persons with SCI/ABI and their significant others ( $n=152$ ).

**Methods:** Participants completed self-report measures of self-efficacy (General Competence Scale), personal and family adjustment (Hospital Anxiety and Depression Scale and McMaster Family Assessment Device). MANOVA analyses were conducted to test if personal and family adjustment differed between groups based on self-efficacy scores of both persons in a dyad.

**Results:** Personal and family adjustment problems six months after clinical discharge were significantly more common among dyads in which both persons reported low self-efficacy at the start of clinical rehabilitation compared to dyads in which both persons reported high self-efficacy. In the low self-efficacy dyads ( $n=18-19$ ) 53-65% of the persons reported symptoms of anxiety, 53-59% symptoms of depression, and 44-50% problematic family functioning. In the high self-efficacy dyads ( $n=53-63$ ) these percentages were respectively 19-31% (anxiety), 19-27% (depression) and 11-19% (problematic family functioning).

**Discussion and conclusions:** Dyads in which both persons have low self-efficacy are more at risk for personal and family adjustment problems.

**Clinical message:** Risk screening based on self-efficacy may help health professionals to identify and support families at risk.

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## O-14

### Is diagnosis a predictor for the level of community participation for patients after rehabilitation?

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**Introduction:** Participation is a core outcome of rehabilitation. However, it is not clear whether participation problems are diagnosis-specific or generic.

**Objective:** To determine differences in participation problems between diagnostic-groups, with and without correction for confounders.

**Patients:** Patients: Data of 1928 patients, from nine different studies, were analysed. Diagnostic-groups included: brain injury (n=666), neurological disorders (incl. neuromuscular diseases) (n=124), oncology (n=138), chronic pain disorder (CPD) (n=64), heart diseases (n=574), spinal cord injury (n=286) and musculoskeletal disorder (n=75).

**Methods:** Participation was measured with the Utrecht Scale for Evaluation of Rehabilitation-Participation. This measure has three scales; restrictions, satisfaction and frequency. Every scale consists of three domains; productivity, social and recreation. Possible confounders are patient characteristics.

**Results:** Results: In all three scales significant (<0.05) differences in level of participation between diagnostic-groups were found. People with heart diseases showed the best level of participation compared to all other diagnostic groups. People with neurological disorders showed the lowest scores in satisfaction and most restrictions, people with CPD showed the lowest score in frequency. All diagnostic groups, except heart disease, showed the best levels of participation in the social domain. After correcting for confounders, diagnosis still explained statistically significant proportions of the variance of participation (frequency 8.9%, restrictions 15.8%, satisfaction 5.5%).

**Discussion and conclusions:** There are differences in levels of participation between diagnostic-groups, also after correcting for confounders.

**Clinical message:** Participation problems are common and differences in participation profiles between diagnostic-groups are found. These results can help to set personalized rehabilitation goals to prevent problems in participation.

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## O-15

### Family functioning in patients with acquired brain injury and their partners

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**Introduction:** After an acquired brain injury (ABI), family functioning is often only assessed in caregivers, since patients may experience cognitive and communicative disorders. To improve the correct interpretation of caregiver assessment, studies investigating agreement within patient-caregiver dyads are needed.

**Objective:** We aimed to investigate differences and levels of agreement between patients and partners in their perception of family functioning and to explore if demographic characteristics and psychosocial functioning of patients and their partners are associated with a different perception of family functioning.

**Patients:** Baseline data was used from patients and partners participating in the ongoing CARE4Patient and CARE4Carer trials.

**Methods:** Cross-sectional study

**Results:** The sample consisted of 77 patient-partner dyads (87.0% stroke). Partners reporting unhealthy family functioning reported significantly higher caregiver burden, higher anxiety and higher

depression scores. In addition, more time had passed since the brain injury and patients were more often living at home. A significant difference was observed in the perception of family functioning between patients and their partners, with partners reporting poorer family functioning. Within-dyads agreement was moderate on general family functioning and low on the individual items. Differences in perceived family functioning within dyads is associated with age and depressive symptoms of the partner ( $R^2 = .19$ ). For older age, partners reporting better family functioning compared to patients. For depressive symptoms partners reporting poorer family functioning.

**Discussion and conclusions:** It is preferable to assess family functioning in both patients with ABI and their partners, since significant differences in their perceptions exist.

**Clinical message:** It is important to monitor family functioning, especially when patients are living at home and professional support tapers off.

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## O-16

### **Measures used to assess impact of providing informal care among caregivers of persons with stroke, spinal cord injury or amputation: A systematic review**

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**Objective:** Many measures of impact of caregiving are available. A comparative overview of their characteristics is lacking. The aims were to identify measures used to evaluate the impact of caregiving among caregivers of persons with stroke, spinal cord injury and amputation, and to evaluate their clinimetric properties.

**Search strategy:** Two systematic reviews were conducted. First, articles (2008 - April 2018) were included if results were reported of administering an impact of caregiving measure to informal caregivers of adult persons with stroke, spinal cord injury or amputation. Measures used in  $\geq 2$  studies were selected and a second search was conducted (no date limit) for validation studies of these measures. Selected articles were analysed using the COSMIN guidelines.

**Selection of articles:** -

**Optional: Evaluation of articles and results:** A total of 167 publications from 132 studies were identified. Forty-one caregiving impact measures were used. The Caregiver Strain Index and Zarit Burden Interview were the most common measures. Eighteen measures were used in more than one study. Ninety validation studies of these measures were found. Structural validity, internal consistency, and concurrent validity were often investigated. Scale development and content validity were rarely described and tests of measurement error or responsiveness were exceptional. Most supporting evidence was found for the Zarit Burden Interview Short Form, Caregiver Burden Scale and Positive Aspects of Caregiving Questionnaire.

**Conclusion:** There is a wide variety of impact of caregiving measures and the validation of most measures is incomplete. A few measures with relatively adequate supporting evidence could be identified, but more research is needed.

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## FREE PAPER SESSION A7

O-17

### **The effect of intrathecal baclofen in dyskinetic cerebral palsy: the results of the IDYS trial**

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**Introduction:** Intrathecal baclofen treatment (ITB) is used for the treatment of dystonia in patients with severe dyskinetic cerebral palsy (CP), however, the current level of evidence for the effect is low.

**Objective:** The primary aim of this study was to provide evidence for the effect of intrathecal baclofen treatment on individual goals in patients with severe dyskinetic cerebral palsy.

**Patients:** with severe dyskinetic CP (Gross Motor Functioning Classification System (GMFCS) level IV-V), age 4-24, eligible for ITB, were included.

**Methods:** We conducted a multi-centre, randomized, double-blind, placebo-controlled trial was at the University Medical Centers of Amsterdam and Maastricht. Patients were randomly assigned for treatment with intrathecal baclofen or placebo via an implanted micro-infusion pump for three months. The primary outcome was Goal Attainment Scaling of individual treatment goals (GAS T-score). Secondary outcomes included dystonia, spasticity, pain and comfort. Safety analyses were done for number and type of (serious) adverse events.

**Results:** Thirty-six patients were included. Mean (SD) GAS T-score at three months was 38.9 (13.2) for ITB and 21.0 (4.6) for placebo ( $p < 0.001$ ). Dyskinesia Impairment Scale scores for total dystonia and dystonia during rest were significantly different between groups, in favor of ITB. Other secondary outcomes and (serious) adverse events were similar between groups.

**Discussion and conclusions:** With this trial we provide evidence that ITB is superior to placebo in achieving treatment goals in patients with severe dyskinetic CP. Future studies should address long-term effects and factors influencing outcome. Furthermore, we need reliable measurement methods for dystonia in severe dyskinetic CP.

**Clinical message:** -

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O-18

### **Marfan syndrome in adolescence: adolescents' perspectives on (physical) functioning, disability, contextual factors and support needs**

Jessica Warnink-Kavelaars<sup>1</sup>, Anita Beelen<sup>1,3</sup>, Tine M.H.J. Goedhart<sup>1</sup>, Lisanne E. de Koning<sup>4</sup>, Frans Nollet<sup>1</sup>, Mattijs W. Alsem<sup>1</sup>, Leonie A. Menke<sup>2</sup>, Raoul H. H. Engelbert<sup>1,2,4</sup>

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**Introduction:** Marfan syndrome (MFS) is a rare hereditary connective tissue disorder caused by a mutation in the *FBN gene*. It affects the cardiovascular, musculo-skeletal, ophthalmic and pulmonary systems and facial features. Although essential for providing optimal adolescent patient support, knowledge of the impact of Marfan syndrome (MFS) in adolescence is limited.

**Objective:** To explore adolescents' perceived impact of MFS on (physical) functioning (activities, participation), disability (limitations, restrictions), contextual factors and support needs.

**Patients:** 19 adolescents with MFS, aged 12 to 18 years, were interviewed.

**Methods:** Audio-recordings were transcribed, coded and analysed using thematic analysis.

**Results:** Identified themes were "difficulties in keeping up with peers" and "being and feeling different from peers". Furthermore an adolescent MFS-specific ICF-CY model of (physical) functioning and disability derived from the data. Adolescents perceived problems in keeping up with peers in school, sports, leisure, friendships/relationships and they could not meet work requirements. Moreover, participants perceived to differ from peers due to their appearance and disability. Contextual factors: coping with MFS, self-esteem/image, knowledge about MFS, support from family, friends and teachers, ability to express support needs and peer-group acceptance, acted individually as barrier or facilitator for identified themes.

**Discussion and conclusions:** Adolescents with MFS perceived limitations and restrictions in (physical) functioning. They perceived problems in keeping up with peers and perceived to differ from peers due to their appearance and disability.

**Clinical message:** The adolescent's perceived impact of MFS warrants awareness by medical professionals, relatives and friends and requires tailored physical, psycho-social, educational and environmental support programmes to improve (physical) functioning and empowerment of adolescents with MFS.

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**O-19**

### **Compensation strategies used to move a glass to the mouth in Duchenne muscular dystrophy**

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**Introduction:** Knowledge of upper extremity (UE) compensation strategies in Duchenne muscular dystrophy (DMD) could aid in management of UE functioning and development of outcome measures.

**Objective:** This study aims to describe compensation and factors influencing the ability to move a glass to the mouth (GTM; weight: 200g).

**Patients:** 20 non-ambulant DMD patients and 12 healthy controls (HCs) performed 10 GTMs in front of Microsoft's Kinect®.

**Methods:** Presence of compensation (i.e. neck flexion, shoulder abduction/endorotation, trunk movement, and elbow support) was determined visually and using the Kinect®. Visually present compensations were deemed objectifiable with Kinect® when compensatory movements exceeded mean±2SD of HCs. In addition, possible GTM influencing factors were assessed: forearm weight and elbow flexion strength.

**Results:** 16 patients (age range 8.6-24.1y) were able and four patients (age range 11.0-17.3y) were unable to perform GTM. Five patients used no compensation. Compensation strategies included: shoulder (1x), trunk (1x), shoulder+trunk (1x), shoulder+trunk+neck (2x), elbow+neck (1x), elbow+trunk (1x), elbow+trunk+neck (4x). Neck flexion (7/7) and trunk movement (9/9) could be objectified with Kinect® in all patients, shoulder abduction in half (2/4) and elbow support in none (0/6) of the patients. All ten patients with elbow flexion strength >1.5x the combined weight of forearm and glass could perform GTM.

**Discussion and conclusions:** DMD patients use various compensation strategies to perform GTM, of which neck flexion and trunk movement could be objectified using Kinect®.

**Clinical message:** Knowledge of compensation strategies and factors influencing the ability to perform GTM might aid in timing the request for an arm support.

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## O-20

### **Family impact in children and young adults with acquired brain injury; outcomes in a rehabilitation cohort**

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**Introduction:** The consequences of acquired brain injury (ABI) in children and young adults may have persisting impact on families. There is a lack of knowledge regarding this impact and its determinants, especially in those patients with ABI receiving rehabilitation treatment.

**Objective:** To study family impact and its determinants.

**Patients:** Families of all patients (14-24 years old) referred to rehabilitation due to ABI, were eligible to participate.

**Methods:** For this cross-sectional study, patient characteristics were gathered and families filled out the 36-item PedsQL™ Family-Impact-Module (5 subscales (total, parental QoL (including emotional functioning), family functioning, worrying, communication); 0-100, lower score→higher impact). Descriptive statistics were used and linear regression analyses were performed to investigate which factors were related to family impact.

**Results:** Fifty-four families participated. Thirty-eight patients had traumatic ABI, 27(50%) were male, 20(37%) were 18-24 years old (median age 17.00[IQR 15.00-19.25]). The median total FIM score was 75.33(IQR 63.64-86.16). Family impact was greater when a patient had premorbid problems. Non-traumatic ABI was associated with lower scores on emotional functioning. Parents tended to worry more in the older age group (18-24 years old). In patients referred to rehabilitation <6 months after ABI, more problems in the family functioning scale were reported.

**Discussion and conclusions:** This study showed that family impact after ABI in children and young adults referred to rehabilitation is considerable, especially in patients with premorbid dysfunctions.

**Clinical message:** The findings in this study underline the importance of measuring family impact and may help to better tailor and provide support to reduce family impact.

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## FREE PAPER SESSION A8

O-21

### **The implementation of and satisfaction with an eRehabilitation intervention in the rehabilitation setting after stroke**

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**Introduction:** Despite growing opportunities to use eRehabilitation interventions, these are still not structurally used in stroke rehabilitation in the Netherlands.

**Objective:** To gain insight in the implementation of and satisfaction with an eRehabilitation intervention, in this case Fast@home.

**Patients:** Healthcare professionals in two rehabilitation centers

**Methods:** The implementation of and satisfaction with Fast@home among healthcare professionals (n=53) was evaluated using a survey (30 items, each scale 1-10).

**Results:** Thirty-three professionals (7 rehabilitation physicians, 12 physiotherapists, 14 occupational therapists) completed the questionnaire (response rate 63%); 25 (67%) of these professionals used the eRehabilitation intervention with at least one stroke patient. Implementation activities (including education, support, coaches, feedback about usage) were known by on average 18 (72%) of those 25 professionals. The joint education prior to the use of eRehabilitation (mean satisfaction=7.0, SD0.9) and support by coaches (6.8 SD1.8) were rated as most valuable, students available for support (5.2, SD3.0) and online e-learning (5.0, SD2.5) were rated least valuable. The most hampering barriers for the implementation were lack of user-friendliness of eRehabilitation, especially for stroke patients, and lack of integration in existing workflows. Eighty-eight% (n=22) professionals wished to use eRehabilitation in the future, 56% (n=14) recommended Fast@home to others.

**Discussion and conclusions:** Although professionals wanted to use eRehabilitation, implementation remained challenging. Reaching healthcare professionals and integration of an eRehabilitation program into existing workflows should be improved.

**Clinical message:** Better support of the implementation including a feasible eRehabilitation intervention is needed to meet the healthcare professionals' wish to use eRehabilitation during stroke rehabilitation.

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O-22

### **Young adults with transversal upper limb reduction deficiency: the role of the rehabilitation center in supporting transition to adulthood**

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**Introduction:** Young adults with transversal upper limb reduction deficiency (tULRD) experience limitations regarding education, job selection and transportation during transition to adulthood. The role of the rehabilitation center is reported to be limited.

**Objective:** To evaluate 1) opinions of young adults with tULRD, parents and professionals regarding the role and accessibility of the rehabilitation center in addressing limitations during transition to adulthood; 2) their needs and suggestions to improve rehabilitation care.

**Patients:** Young adults with tULRD, parents, professionals.

**Methods:** A qualitative study using two online focus groups among young adults and parents during 4 consecutive days and a face-to-face focus group among professionals was performed. The framework approach using Atlas-Ti software was applied for data analysis.

**Results:** 16 young adults (mean age 19.8 (SD 3.1) years, 5 males), 11 parents (4 males) and 17 professionals participated. Participants mainly contacted the rehabilitation center for care regarding stump or prostheses and were mostly unaware of care facilities regarding transition domains. Professionals indicated these transition topics were addressed during periodic appointments, however few are visited, because of unclear aims or limited benefit. Young adults and parents have a need to find reliable information and share peer experiences on demand.

**Discussion and conclusions:** The role of the rehabilitation center is often unclear and periodic appointments do not adequately match the needs. Rehabilitation teams face challenges to supply reliable information and to support demand-driven appointments to stay connected with young adults with tULRD.

**Clinical message:** Rehabilitation care for young adults with tULRD should aim at developing methods for providing relevant information on demand and facilitate peer contact.

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## O-23

### Discussing Personalised Prognosis in Amyotrophic Lateral Sclerosis: Development of a Communication Guide

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**Introduction:** The recently developed personalised prediction model for life expectancy in amyotrophic lateral sclerosis (ALS) raised concerns on how to discuss personalised prognosis without causing anxiety and destroying hope.

**Objective:** To develop consensus recommendations on discussing personalised prognosis in patients with ALS that can guide neurologists and rehabilitation physicians.

**Patients:**

**Methods:** Recommendations were developed by a working group of neurologists, rehabilitation physicians and researchers, with an expert panel (patients, caregivers, ethicist and spiritual counsellor), based on evidence and expert opinions using consensus procedures. A systematic review was conducted to quantitatively and qualitatively synthesize evidence on effects of and needs for discussing prognosis in patients with a life-limiting disease.

**Results:** The evidence synthesis showed that discussing life expectancy had no negative effect on patients, if tailored to patient readiness. Themes regarding patient needs included honest communication, tailored information respecting cultural norms and values, hope-giving, family support

and family-mediated communication. The working group developed draft recommendations on conveying uncertainty of estimates, tailoring information to individual needs in a culturally sensitive way, and discussing prognosis in patients with cognitive dysfunction/frontotemporal dementia. Recommendations were discussed with the expert panel and revised accommodating their comments.

**Discussion and conclusions:** Consensus recommendations, emphasizing the need for individual tailoring, were formulated to provide guidance to neurologists and rehabilitation physicians in discussing personalised prognosis in patients with ALS and their informal caregivers.

**Clinical message:** Personalised prognosis of patients with ALS, if and when desired, should be discussed with honesty, tailored to the individual needs and preferences respecting cultural values.

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## O-24

### **Fatigue, participation and quality of life in adolescents and young adults with acquired brain injury in an outpatient rehabilitation cohort**

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**Introduction:** Fatigue is common after acquired brain injury (ABI) in adolescents and young adults (AYAs). There is a knowledge gap regarding fatigue as a multidimensional concept after ABI in AYAs and the mutual relationships with participation and quality of life (QoL).

**Objective:** To study the influence of fatigue on participation and QoL after ABI in AYAs.

**Patients:** AYAs aged 14-25 years diagnosed with ABI (traumatic (TBI)/non-traumatic (NTBI)) referred to an outpatient rehabilitation clinic between 2014-2018.

**Methods:** A multicenter cross-sectional questionnaire study was conducted. The present analysis concerns data at admission from one center only. The PedsQL™ Multidimensional Fatigue Scale (MFS), Child and Adolescent Scale of Participation (CASP), and PedsQL™ 4.0 Generic Core Scales (PedsQL) were used (all 0-100, higher score-better functioning). Associations between fatigue and participation and QoL were investigated using linear regression analysis.

**Results:** Sixty-four AYAs participated in the study, 47 (73%) with TBI. Median age at inclusion was 17.6 years (IQR 16.2;20.0) and time since injury 0.8 years (IQR 0.2;2.3). Patients reported high levels of fatigue (median 44.4 (IQR 34.7;59.7)), limited participation (82.5 (68.8;92.3)), and diminished quality of life (63.0 (47.8;78.3)). More fatigue was strongly associated with more participation restrictions ( $\beta$ -estimate 0.64,  $p < 0.001$ ) and diminished QoL ( $\beta$ -estimate 0.87,  $p < 0.001$ ).

**Discussion and conclusions:** AYAs with ABI reported high levels of fatigue, restricted participation and diminished health-related quality of life with a significant association between fatigue and diminished participation and QoL.

**Clinical message:** Targeting fatigue in rehabilitation treatment could potentially improve participation and QoL.

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## MINI-SYMPOSIA AND WORKSHOPS

### Thursday 7 November

#### PARALLEL SESSION A – WORKSHOPS AND FREEPAPERS

- A1. Workshop: How to implement, that is the real challenge!
- A2. Workshop: Set out for future-directed rehabilitation medicine. The professional meets the patient: interprofessional learning and collaborative

#### PARALLEL SESSION B – MINI-SYMPOSIA AND WORKSHOPS

- B3. Mini-symposium: Rehabilitation Medicine: in the right place, at the right time .... concerning issues of information exchange in the digital world
- B4. Workshop: Personal Health Record in Rehabilitation: what is the added value for transmural rehabilitation care?
- B5. Workshop: Extracorporeal shockwave therapy: a new treatment for spasticity
- B6. Mini-symposium: Ankle-foot orthoses: considerations and perspectives on the design and timing of provision
- B7. Mini-symposium: Big data in pain rehabilitation
- B8. Mini-symposium: How to maximize the placebo effect of rehabilitation

### Friday 9 November

#### PARALLEL SESSION C – MINI-SYMPOSIA AND WORKSHOPS

- C1. Workshop: Social media in rehabilitation: in the right place, at the right time
- C2. Workshop: Building an EPA-based training plan for residents in rehabilitation medicine: learning in the right context, at the right time
- C3. Mini-symposium: Beweging ziekenhuis - Exercise as a medicine in the hospital environment?!
- C4. Workshop: Clinical application of exercise testing in children with walking problems due to childhood onset disability
- C5. Mini-symposium: Personalised rehabilitation medicine: how to get the right assistive device on the right patient at the right time
- C6. Workshop: Innovations and strategies to enhance physical activity in your rehabilitation centre
- C7. Mini-symposium: Rehabilitation medicine: care in the right place, at the right time AND by the right person
- C8. Mini-symposium: Permissive weight-bearing: the next step

#### PARALLEL SESSION D – DEBATE AND PHD THESIS SESSION

- D1. PhD thesis session: presentations of the best PhD theses in the Netherlands
- D2. Debate: Collaboration between geriatric and medical specialist rehabilitation care

#### PARALLEL SESSION E – MINI-SYMPOSIA AND WORKSHOPS

- E1. Mini-symposium: To educate the future doctor in Rehabilitation Medicine: Fun and Facts!
- E2. Workshop: Setting meaningful goals in rehabilitation
- E3. Mini-symposium: Strengthening the developmental perspective in pediatric rehabilitation care for youth with cerebral palsy (CP): implementing the PERRIN results
- E5. Mini-symposium: Manual wheelchair mobility: a continued future concern
- E6. Mini-symposium: Spasticity treatment in the right place: time to concentrate care?
- E7. Mini-symposium: Targeted offloading with rocker profiles
- E8. Workshop: Keep on training with ReVi! An e-health application to support individualized home-based aerobic training.

## **PARALLEL SESSION A – Workshops and freepapers**

### **AB-1. Workshop: How to implement, that is the real challenge!**

**Session Topic:** Science, Miscellaneous

#### **Session Description:**

Implementation is a key aspect of scientific research and is getting more and more attention in scientific literature, lately. It is for this reason that in 2018 de WECO has adopted implementation as an additional focus of attention. Implementation is a relatively unknown territory, at least for a substantial part of the rehabilitation physicians. Therefore, it is a challenge for the WECO to spread knowledge about the ins and outs of implementation and, moreover, give support in putting implementation into practice. A first step in this process was the organization of a workshop, aiming to elucidate the basics of implementation, during the colloquium 2019, in Nieuwegein. Based on the experiences of this workshop and the feedback of the attendants, an informative program for an instructional course is composed.

Objective of the instructional course:

- Gather information on techniques how to implement results from scientific research into daily practice;
- Putting techniques how to implement into practice during a hands-on course, and that way:
- Develop a toolkit: - “how to implement my own research results or results from other research”; - “where to get relevant information or support”

Preliminary program:

1. Introduction (Jeanine Voorman and Rienk Dekker)
2. Implementation: how to put into practice? Guidelines (Femke van Nassau en Sacha van Twillert)
3. Hands on: carousel: Based on the guidelines presented: make an implementation plan (Femke van Nassau, Sacha van Twillert, Rienk Dekker and Jeanine Voorman)
4. Discussion, conclusion, take home messages and tool kit (Rienk Dekker and Jeanine Voorman)

#### **Session Moderator:**

- J. Voorman
- R. Dekker

#### **Session Presenter(s):**

- Dr. Jeanine Voorman, Revalidatiearts, Department of Rehabilitation, Physical Therapy Science & Sports, UMC Utrecht Brain Center, University Medical Center Utrecht, Utrecht
- Prof. Dr. Rienk Dekker, Revalidatiearts, Afdeling Revalidatiegeneeskunde UMCG, Groningen
- Dr. Femke van Nassau onderzoeker, Afdeling Public and Occupational Health and Amsterdam Public Health research institute, Amstedeam UMC, Locatie VUmc
- Dr. Sacha van Twillert stafadviseur implementatie, Kenniscentrum Kwaliteit en Veiligheid, UMCG, Groningen.

#### **Abstract Titles:**

- Introduction
- Implementation: how to put into practice? Guidelines
- Hands on: carousel: Based on the guidelines presented: make an implementation plan
- Discussion, conclusion, take home messages and tool kit

## **AB-2. Workshop: Set out for future-directed Rehabilitation Medicine The (future) professional meets the patient; interprofessional learning and collaborative practice**

**Session Topic:** Applicable to multiple dias..., Miscellaneous

### **Session Description:**

To provide the right care in the right place at the right time, and in close cooperation with the patient, carers, and professionals, new innovative approaches in rehabilitation services are necessary. Networking and interprofessional collaboration, as well as teaching skills for professionals, and the shift from activity oriented outcomes to participation are important building blocks of these new approaches. These building blocks serve as fertile grounds for innovation and learning. There are many similarities between a patient journey and the educational journey of our students. However, as health professionals, we are not used to translate the expertise from our colleagues in education into our own daily practises. In interprofessional education students have the opportunity to learn about, from, and with two or more professionals and peers in daily practise to enable cooperation, and to improve collaboration and the quality of care (CAIPE, 2002). Our patients should be given the same opportunities in learning to cope with their new or different capabilities. In interprofessional learning, both teachers and therapists become facilitators. Their work shifts from teaching/treating to facilitating interactive and collaborative learning. As facilitators they will be confronted by students and patients from diverse (professional) backgrounds with different perspectives, expectations, assumptions and styles of learning (Lie, Forest, Kysh & Synclair 2016). This calls for new professional competence and skills in rehabilitation medicine. This workshop is designed to expose the attendants to best practices of interprofessional learning and collaborative practice. We will share a framework for interprofessional learning and collaborative practice and discuss how to fit these best practices into a rehabilitation setting. Moreover, we will be practising skills so that the attendants will be able to translate and promote interprofessional learning and collaborative practice into their daily workspaces.

### **Session Moderator:**

- A.A. van Kuijk

### **Session Presenter(s):**

- C. Vuijk
- A. van der Neut
- R. Jansens
- G. Heerschop

### **Abstract Titles:**

- Set out for future-directed Rehabilitation Medicine The (future) professional meets the patient; interprofessional learning and collaborative practice

## **PARALLEL SESSION B – MINI-SYMPOSIA AND WORKSHOPS**

### **B3. Mini-symposium: Rehabilitation Medicine: in the right place, at the right time .... concerning issues of information exchange in the digital world**

**Session Topic:** E-Health/ Tele-medicine,

### **Session Description:**

Health information technology is more and more involved in (Rehabilitation) Medicine. From an adequate electronic health record, patient portal, e-health to Personal Health Environment (in Dutch: PGO). The majority of the Dutch hospitals have appointed a Chief Medical Information Officer (CMIO); what is their role? What do medical doctors have to know about information exchange? We

need to exchange data for qualitatively good healthcare, but not all health care workers are aware of the obstructions and possibilities in exchanging patient data. The goal of the workshop is to inform medical doctors about CMIO's, the national information exchange programmes, the consequences of the General Data Protection Regulation (in Dutch: AVG) and the Personal Health Environment (PGO). In the mini-symposium speakers of the Dutch CMIO network, the Royal Dutch Medical Association (in Dutch: KNMG) and MedMij will clarify juridical, medical and participation themes. Afterwards there will be enough time for discussion.

### **Programme outline**

Chairman: MA (Marieke) Paping, MD, rehabilitation physician and CMIO Rijndam Rehabilitation, Rotterdam

Speakers:

1. Dr IJAM (Iris) Verberk-Jonkers, MD, internist-nephrologist Maasstad Ziekenhuis, Rotterdam, Chairman of the Dutch CMIO network The CMIO, what is that, what is it for; Update on the progress and impact of national information exchange programmes and ehealth in every day practice
2. Mr dr S (Sjaak) Nouwt, advisor health law, KNMG Using patients data in the era of General Data Protection Regulation (in Dutch: AVG)
3. JC (Netteke) Koster, MD, implementation advisor MedMij The personal health environment (PGO) for managing health and healthcare and the sharing of data

Verberk: Although medicine has evolved and innovated, information exchange in the Netherlands in hospitals, between hospitals and rehab centers and also between hospitals-rehab centers and patients is not automated yet causing delay in communication and potential harm. Recently national programs have been initiated to address this issue like VIPP and OPEN, and a basic set of minimal information has been determined, the basisgegevensset zorg. The success of these programmes depend on the active participation and contribution of medical doctors, since adjustments in current working processes are likely requested. Three years ago a Dutch network has been launched the Dutch CMIO-chief medical information officer -network which serves the interest of medical doctors on this topic to the ministry, the FMS, Nictiz and software companies. At this moment the majority of the Dutch hospitals have appointed a CMIO. Iris Verberk, chairman of this network, will give you an update on these programmes and will provide information on the progress of the CMIO network.

Nouwt As from May 25, 2018, new European data protection rules are applicable: the General Data Protection Regulation, GDPR (Algemene Verordening Gegevensbescherming, AVG). Everyone has heard about it. In the Netherlands, the GDPR is further elaborated in national legislation: the GDPR-Implementation Act (Uitvoeringswet AVG). Also existing national legislation in the field of health law is still applicable, more specifically regarding the digital disclosure of patients data. In this workshop I will inform the participants about: • how the GDPR applies to patients data; • how the Dutch national rules and regulations relate to the GDPR, especially with regard to the rules of medical secrecy; • the new digital rights patients have, based on national legislation and the GDPR.

Koster The personal health environment (PGO) gives patients the option of managing their own health and healthcare and managing the sharing of their data. It is a lifelong digital instrument where patients can gather and manage all their health data from different healthcare providers in one place. It offers peace of mind, confidence and insights, because it creates a clear and accurate picture of how an individual's personal health is developing and what they can do to improve it. Using a PGO

can also help the professional to deliver the right (and best) care and support. In addition, professionals are given easier access to the relevant information that is shared by the individual. People become better informed themselves too. This facilitates collaboration and communication between professionals.

**Session Moderator:**

- M.A. Paping

**Session Presenter(s):**

- I.J.A.M. Verberk-Jonkers
- N.J.C. Koster
- S. Nouwt

**Abstract Titles:**

- Update on the progress and impact of national information exchange programmes and ehealth in every day practice
- Juridical aspects of exchanging patient information
- The personal health environment (PGO) for managing health and healthcare and the sharing of data

**B4. Workshop: Personal Health Record in Rehabilitation: what is the added value for transmurial rehabilitation care?**

**Session Topic:** E-Health/ Tele-medicine, E-Health/ Tele-medicine, Miscellaneous, Miscellaneous

**Session Description:**

The Dutch government aims for nationwide implementation of Personal Health Record (PHR) in 2020, to empower citizens in periods of health and impairment. The Center for Rehabilitation (CfR) of the University Medical Center Groningen (UMCG) focusses on stimulating sustainable active lifestyle and intends to facilitate a smooth transfer from clinic to home setting. Research among our patients indicated that a PHR could give patients insights in their rehabilitation progress providing opportunities for shared decision making between patients and professionals. We assume that PHR results in more patient engagement, contributing to healthier lifestyles. A prototype PHR was developed and a pilot implementation of this PHR is currently performed for active lifestyle coaching for patients within the UMCG CfR. During this workshop a pilot PHR will be presented, and you will gain insight on strategies for implementation of PHR in care settings. First experiences of PHR-users from the pilot will be shared. We would like to discuss how PHR can contribute to improving patients' health, by jointly shaping the rehabilitation process with healthcare and welfare professionals and informal caregivers involved in transmurial rehabilitation care. In small group conversations we will explore opportunities and conditions for rehabilitation wide implementation of PHR. Programme outline 1.General introduction of PHR, nationwide context and examples of PHR's (10 minutes). 2.Empowering patients with PHR: perspectives on UMCG wide implementation in care and research (10 minutes). 3.Pilot implementation of PHR in Center for Rehabilitation: first experiences of patients and professionals (10 minutes). 4.PHR in a transmurial rehabilitation context: facilitators and barriers (10 minutes). 5.Small group conversations on opportunities and conditions for rehabilitation wide implementation of PHR (30 minutes). 6.Plenary wrap-up of ideas on added value of PHR for transmurial rehabilitation care: 'in the right place, at the right time' (15 minutes).

**Session Moderator:**

- A.D. van der Heide
- L.A. Krops

**Session Presenter(s):**

- R.A. Alingh
- T. de Jong
- L.A. Krops
- A.D. van der Heide

**Abstract Titles:**

- Personal Health Record in Rehabilitation: what is the added value for transmural rehabilitation care?

**B5. Workshop: Extracorporeal shockwave therapy : a new treatment for spasticity**

**Session Topic:** Walking - mobility, Brain injury / stroke

**Session Description:**

ESWT is a physical modality used for many years for musculoskeletal conditions. Since more than a decade research papers have been published on the effect of ESWT on spasticity in persons with CP and stroke. Currently it appears that ESWT and Botulinum toxin are equally effective. ESWT is easy to apply , non-invasive and relatively non-expensive. In this workshop we will give an update of the scientific evidence and exchange experiences with the application of this new treatment modality for spasticity. ESWT is now being used in several rehabilitation settings in the Netherlands . However, there is no coordination of activities or protocols. Program: Introduction :Henk Stam chair person ( 10 min) ESWT in persons with stroke : Remco Timmermans ( 20 min ) ESWT is persons with CP : Ruud van der Veen ( 20 min ) Demonstration of application of ESWT (10 min ): Henk Stam Discussion, exchange of experiences, planning of projects or cooperation : all participants ( 30 min )

**Session Moderator:**

- H.J. Stam

**Session Presenter(s):**

- H.J. Stam
- R. Timmermans
- R. van der Veen

**Abstract Titles:**

- Introduction
- ESWT in persons with stroke
- ESWT is persons with CP
- Demonstration of application of ESWT
- Discussion, exchange of experiences, planning of projects or cooperation

## **B6. Mini Symposium: Ankle-foot orthoses: considerations and perspectives on the design and timing of provision**

**Session Topic:** Walking - mobility, Applicable to multiple dias...

### **Session Description:**

Session abstract: Ankle-foot orthoses (AFOs) are frequently used to improve walking in a variety of diseases. The effect of the intervention relies on adequate prescription. The timing of prescription and optimal biomechanical AFO-properties are important. The symposium starts with a recent study on timing of AFO-provision post-stroke, showing that early AFO-provision results in functional improvements, without affecting limb kinematics or muscle-activity. This highlights the importance of the unaffected limb and compensation mechanisms in rehabilitation-therapy. New AFO-designs should be considered to improve the affected leg function. The second contribution will discuss disadvantages of conventional AFOs. Often too stiff AFOs are prescribed, which are less comfortable and restrict ankle-movement and thereby ankle power, also in patients who potentially have some residual muscle strength. AFO-preference from literature, patient perspectives on AFO-designs and a new AFO-design taking patient perspectives and biomechanics into account are presented. The third contribution will focus on the importance of the properties of the foot plate. Stiffness of the foot plate determines the lever arm of the foot, which has large effect on the loading of the ankle joint. The biomechanical effects of AFO-foot plate stiffness on ankle motion and foot and ankle power during the stance phase of gait are demonstrated. Objectives: To understand: 1) The effect of timing of AFO-provision after stroke on gait kinematics and EMG 2) Patient-perspectives and biomechanical aspects of AFO design 3) Importance of AFO foot plate stiffness on foot and ankle power during gait Programme: Introduction symposium (5min) Ankle-foot orthoses after stroke. What can we learn from the timing of AFO-prescription? (20min+5min questions) Patient centered development and clinical evaluation of an ankle-foot orthosis. (20min+5min questions) Effects of AFO foot plate stiffness on ankle power during walking : what AFOs and klapskates have in common. (20min+5min questions) General discussion and questions (10min) Total 90min

### **Session Moderator:**

- J.H. Buurke

### **Session Presenter(s):**

- C.D.M. Nikamp
- J.M. Hijmans
- H. Houdijk

### **Abstract Titles:**

- Ankle-foot orthoses after stroke: the sooner the better?!
- Patient centered development and clinical evaluation of an ankle-foot orthosis
- Effects of AFO foot plate stiffness on ankle power during walking : what AFOs and klapskates have in common

## **B7. Mini Symposium: Big data in pain rehabilitation**

**Session Topic:** Technology, Pain

### **Session Description:**

In The Netherlands, patients with chronic musculoskeletal pain that visit a rehabilitation physician, are invited to fill out various questionnaires before treatment. Based on the outcome of the questionnaires and the consultant's opinion created during the consultation, the patient will be referred to the most optimal treatment modality related to the complexity of the pain problem of patient. This process is based on best practice but decision making might hold substantial variations between clinicians. This minisymposium aims to provide an overview of the current innovations possible to improve this process by making it more personalized and evidence-based. Possible solutions might be found via a data-driven machine learning clinical decision support system. This may help to find a more objective way to assess the complexity of the pain problem and a corresponding optimal treatment in stepped care. In pain rehabilitation, data- driven machine learning may help to identify the best suitable treatment for every individual patient, based on the results of former patients. By constant improvement of prediction models, the computer may eventually even beat the rehabilitation physician in choosing the best matched rehabilitation care. A good cooperation between professionals and physicians in the analysing process is of great importance to develop proper and clinical relevant decision tools. The ultimate aim of these studies is to develop a well-founded stepped care model matching with the complexity of the pain problem of patients. Different methods and designs will be presented.

### **Session Moderator:**

- J.L. Swaan

### **Session Presenter(s):**

- A.J.A. Köke
- W. Oude Nijeweme-d'Hollosy
- R. Soer
- H. Hermens

### **Abstract Titles:**

- Data driven pain rehabilitation: The future?
- The use of a vignette study to acquire data for building personalized prognostic Models
- Machine learning for the development of triaging tools for the care of patients with low back pain towards personalized care
- Technological innovations in the treatment of patients with chronic pain

## **B8. Workshop: How to maximize the placebo effect of rehabilitation**

**Session Topic:** Education, Applicable to multiple dias...

### **Session Description:**

In randomized clinical trials we aim to minimize placebo effects, whereas in daily clinical practice practitioners may be able to utilize placebo effects to improve treatment outcomes. Why is it that placebo treatments can make us feel better? When a treatment is stripped from its intended

effective parts, what is left is the meaning of the treatment context to the patient. Hence, when we think of placebo effects, we should not be thinking of fake treatments. Instead, we should be thinking of effects caused by the context surrounding a treatment. This workshop will start with an interactive presentation giving an overview of recent insights from the area of placebo research and the underlying mechanisms of placebo effects. In the second part of the workshop the focus is on answering the question of how to maximize the placebo effect in rehabilitation. The audience will be invited to reflect on real life clinical cases and discuss different ways of improving treatment outcomes in rehabilitation medicine through optimizing the placebo component. Objectives: After the workshop participants will be able to: • recognize the importance of placebo effects in daily clinical practice • understand the underlying principles of placebo effects • assess how placebogenic their own healthcare practice is • take home lessons to maximize the placebo effect in rehabilitation

**Session Moderator:**

- J.T. Porsius

**Session Presenter(s):**

- J.T. Porsius
- R.W. Selles
- R.M. Wouters
- M.J.W. van der Oest

**Abstract Titles:**

- How to maximize the placebo effect of rehabilitation

## **PARALLEL SESSION C – MINI-SYMPOSIA AND WORKSHOPS**

### **C1. Workshop: Social media in rehabilitation: in the right place, at the right time**

**Session Topic:** Professional interests, Applicable to multiple dias...

#### **Session Description:**

Session abstract - Social media are dynamic and interactive computer-mediated communication tools and are the fastest growing mechanism for the exchange of personal and professional information. These technologies encompass blogs, social networks (Linkedin, Facebook, Twitter), video- and photo-sharing sites, wikis, and myriad other media, and are pervasive around the world – indeed, in 2012, Facebook surpassed a billion users worldwide, or nearly 1/7th of humanity. Within healthcare, recent estimates of social media usage by doctors has risen dramatically from 41% in 2010 to 90% in 2011, while rates of use have been found to be above 90% for medical students. Use of social media, in some form, is likely to continue in the foreseeable future. However, in rehabilitation, a large number of professionals are unaware of social media's relevance, potential applications in their day-to-day activities, as well as the inherent risks and how these may be attenuated and mitigated. While there are advantages associated with instantaneous communication with an unlimited number of contacts, there are also consequences, anticipated or unintended, like misjudgments, and privacy violations. And is it necessary to use social media as a professional? Do we have to learn our students to use social media in the right way? - Program outline 1.A short introduction on the different forms of social media. Discussion: what are the experiences of the audience with social media? (20 minutes) 2.Examples of the use of social media in Rehabilitation and other specialisms. Discussion: what are good examples? What can we learn from other experts? What can we do better? (30 minutes) 3.Practice with social media yourself, what can you tell other about the DCRM congress? (40 minutes)

#### **Session Moderator:**

- N.B.M. Voet
- van der Ham

#### **Session Presenter(s):**

- van der Ham
- N.B.M. Voet
- C.F. van Koppenhagen
- J.W. Gorter

#### **Abstract Titles:**

- Social media In Rehabilitation: in the right place, at the right time

## **C2. Workshop: Building an EPA-based training plan for residents in rehabilitation medicine: learning in the right context, at the right time**

**Session Topic:** Education, Applicable to multiple dias...

### **Session Description:**

Postgraduate medical training for rehabilitation medicine residents is shifting towards EPA-based training (Entrustable Professional Activities). EPAs are descriptors of professional work that enable stepwise progression to unsupervised practice for trainees. In the Netherlands, a new EPA-based training plan will be implemented mid-2020. The new structure and building blocks of the training plan ask for a review of the way and sequence in which education is planned in place and time. In which learning context, in which order and when should residents work on their EPA's and other elements of training? How and when is learning in the right place at the right time? Is there an ideal routing, or is that impossible in daily practice? In this workshop, we will build literally pathways for residents based on the new training plan. You will discover what the new training plan implies for your daily training practice in your training circuit (OOR). So join us together with your regional training partners. After a brief introduction of the procedure, we will continue with an interactive 'building session'. Based on a future job-opening for a just graduated resident, small groups of regional training partners of different learning-contexts will build the 'ideal' training route for that particular resident in their circuit. To build the pathway groups will have to meet the criteria of the new training plan. As such, you will experience and learn about the new building blocks, principles and possibilities of the training plan. Furthermore, you will also reflect on the possibilities to apply this way of planning education in your own work environment.

### **Session Moderator:**

- A.A. van Kuijk

### **Session Presenter(s):**

- R. Dahmen
- V. de Groot
- T. Burgmeijer
- M. Bolk

### **Abstract Titles:**

- Building an EPA-based training plan for residents in rehabilitation medicine: learning in the right context, at the right time

## **C3. Mini Symposium: Beweegziekenhuis - Exercise as a medicine in the hospital environment?!**

**Session Topic:** Fitness-moving, Applicable to multiple dias...

### **Session Description:**

Healthy Aging' is a driving ambition today and embraces even more explicitly active mobility, exercise and participation as key elements in healthy behavior, in today's health and hospital care, both in medical treatment, guidelines and in the physical and social environment. There is the continued need for implementation of research results and new knowledge on "mobility, exercise and sports" in daily rehabilitation practice, as well as in complex medical and general health care. Within a 'Beweegziekenhuis', 'Exercise=medicine' is not only to study, but even more so to teach, to "preach",

and to happen and experience. Although some initiatives and promising plans are in development, the hospital environment in leading University Medical Centres – albeit at work or as a patient – still have many challenges and opportunities towards a stimulating physically active lifestyle and active participation-driven treatment. ‘Exercise as a medicine’ must be advocated among health professionals and opinion leaders. Medical centres ideally are to evolve into an exercise and movement-stimulating hospital, ‘beweegziekenhuis’, a hospital that expresses healthy aging, active lifestyle and ‘exercise=medicine’ in its essentials. With our minisymposium we hope to reach those professional leaders who can and will make the difference, change current practice in rehabilitation and beyond, start to train future professionals in ‘exercise=medicine’ and thus improve medical and rehabilitation care for future generations and over the lifespan. Chair & introduction: 5min Rienk Dekker/Luc van der Woude; PIE=M: 12min Adrie Bouma; Pre-rehabilitation 12min Helco van Keeken/Joost Klaase; DEPART: 12min Sjoukje Bouma/Martin Stevens; Heart-ROCQ: 12min Sandra Dijkstra/Janneke Hartog; Lifestyle advisor: 12min Rianne de Roos; Discussion 25min

**Session Moderator:**

- R. Dekker
- L.H.V. Van der Woude

**Session Presenter(s):**

- F. van Nassau
- H.G. van Keeken
- M. Stevens
- J.H. Hartog

**Abstract Titles:**

- Physicians Implement Exercise=Medicine
- Prehabilitation; being fit before surgery
- DEPART: Barriers and facilitators for applying lifestyle medicine in osteoarthritis: a focus group study among health care professionals
- Heart Rehabilitation in patients awaiting Open-heart surgery to prevent Complications and to improve Quality of life (Heart-ROCQ): a Prospective Randomized Open Blinded End-point (PROBE) trial
- Lifestyle advice in complex hospital care

**C4. Workshop: Clinical application of exercise testing in children with walking problems due to childhood onset disability**

**Session Topic:** Fitness-moving, Paediatric rehabilitation

**Session Description:**

Purpose: This workshop provides clinical examples of how clinical exercise testing can be used in the treatment of walking problems in children and youth with childhood onset disability. Measurements of walking economy and aerobic fitness are important for clinical decision making in treatment of walking problems in children and youth with childhood onset disability. Deviated gait patterns may affect walking economy causing increased energy expenditure during walking and other daily life activities. In combination with low aerobic fitness levels, the physical strain, or effort of walking, can be extremely elevated. This may explain common complaints like early fatigue in daily life activities

and reduced walking distance. Both reduced walking economy and reduced fitness levels may be underlying issues causing these complaints. As this has direct implications for treatment, it is important to measure both components and determine its effect on the physical strain of walking. This workshop starts with a theoretical background of the exercise physiological principles needed to understand and interpret energy cost and fitness test results and its application for clinical decision making. Subsequently, clinical examples are presented in an interactive setting, illustrating indication, interpretation and evaluation of treatment using clinical exercise testing. Discussed treatments include orthotic treatment, orthopaedic surgery, spasticity treatment and physical training. The presenters have a background in pediatric physiotherapy (EM), pediatric rehabilitation medicine (AB), and human movement sciences (AD), and have many years of experience with treatment and research in children and youth with walking problems due to cerebral palsy and other diagnoses.

**Session Moderator:**

- J. Dallmeijer

**Session Presenter(s):**

- E. Muselaers
- A.I. Buizer

**Abstract Titles:**

- Clinical application of exercise testing in children with walking problems due to childhood onset disability

**C5. Mini Symposium: Personalised rehabilitation medicine: how to get the right assistive device on the right patient at the right time**

**Session Topic:** Applicable to multiple dias..., Walking - mobility

**Session Description:**

Session abstract: Personalised medicine may be seen as a “hot new topic” in rehabilitation medicine, but this has already been practiced for many years in instrumented gait labs. For example, in the context of assistive mobility devices, advanced individualized measurements are routinely done to define and create the right device for the right patient at the right time. Continued developments improve this personalized medicine in the gait lab. The aim of this workshop is to discuss state-of-the-art research and clinical practice on this topic. To reach this aim, we have chosen to focus on two specific types of assistive devices: orthopaedic footwear and ankle-foot-orthoses. The presenters in this mini-symposium have longstanding experiences with these devices, both in coordinating clinical trials, translating this into clinical guidelines and applying it in daily clinical practice. During this mini-symposium, a scientist and a clinician will together discuss patient cases where personalised rehabilitation medicine has been applied, in light of scientific evidence. During these presentations, there will be ample room for discussion with the audience on the interpretation and consequences for treatment. Finally, the presenters will provide a sneak preview into the future: what new developments can be expected in gait labs focusing on personalised medicine? Programme outline: Symposium chair: Jaap van Netten; Session outline (1.5 hours): 0.00-0.10: Introduction to personalised (rehabilitation) medicine by Jaap van Netten. 0.10-0.45: Orthopaedic footwear: How to provide the right shoe for the right diabetic foot patient at the right time? Scientist: Sicco Bus;

Clinician: Tessa Busch-Westbroek. 0.45-1.20: Ankle-foot orthoses: How can personalised medicine improve the effectiveness of ankle-foot orthoses? Scientist: Merel Brehm; Clinician: Frans Nollet. 1.20-1.30: General discussion with the audience and closing remarks

**Session Moderator:**

- J. Van Netten

**Session Presenter(s):**

- T.E. Busch-Westbroek
- S.A. Bus
- M. Brehm
- F. Nollet

**Abstract Titles:**

- How to provide the right shoe for the right diabetic foot patient at the right time? The clinician

**C6 Workshop: Innovations and strategies to enhance physical activity in your rehabilitation centre**

**Session Topic:** E-Health/ Tele-medicine, Applicable to multiple dias...

**Session Description:**

Innovations and strategies to enhance physical activity in your rehabilitation centre Abstract: Improving physical abilities including an active lifestyle are important goals of rehabilitation treatment. Nevertheless, physical inactivity during and after rehabilitation is a problem despite extensive rehabilitation programs. The physical rehabilitation environment and the use of eHealth or health care technology have the potential to facilitate a more active lifestyle of clinical patients. Although, initiatives in hospital settings are growing rapidly, less is known about best practices to facilitate physical activity by using the physical rehabilitation environment, health care technology and/or eHealth as a point of engagement. Objectives: After the workshop participants will be able to:

- recognize the importance of a rehabilitation environment to facilitate physical activity
- identify barriers and facilitators for physical activity in a clinical setting
- recognize the potential of eHealth and care technology to facilitate physical activity
- design a rough sketch of an innovative idea to facilitate physical activity
- take home the lessons learned during this session to put physical activity on your centre's agenda

Contents:

A 1.5 hour co-creation workshop within the theme Innovations and strategies to enhance physical activity in your rehabilitation centre: •short introduction and best practices from different settings and participants •discuss 'who/why/what' around this theme by creating 'user stories' •to work on one innovation or a strategy in pressure cooker session(s) e.g. in one of the following themes to enhance physical activity: 1.monitoring behaviour 2.eHealth/technology/changes in the physical environment 3.non-technological solutions •to share all ideas in the group and discuss how these can be continued •to discuss further collaborations Organisational aspects: •maximum number of attendants is 24 •best practices on facilitating physical activity in your centre and questions:

j.meesters@basaltrevalidatie.nl

**Session Moderator:**

- J.J.L. Meesters

**Session Presenter(s):**

- M. van der Ent
- H.E.M. Braakhuis

**Abstract Titles:**

- Innovations and strategies to enhance physical activity in your rehabilitation centre

**C7. Mini Symposium: Rehabilitation medicine: care in the right place, at the right time AND by the right person**

**Session Topic:** Quality of care, Applicable to multiple dias...

**Session Description:**

After a five-year experiment, the Dutch parliament and Dutch Senate agreed to give the Physician Assistant full independence in diagnosing, initiating treatment and performing medical procedures which resulted in admission to the BIG register from 1 september 2018. This autonomous legal role means that the PA can provide independent diagnosis and start the treatment, but the PA has to make agreements with their employer and the medical doctors about the scope of practice. The PA is trained to take on medical and organizational tasks from medical doctors. Despite the consensusdocument task reallocation which was created in 2015 between VRA, NAPA en V&VN VS there are still questions from the workfield about the scope of practice of the PA and how to implement these. At the moment more than 60 PA's are working in the field of rehabilitation medicine. As department PA rehabilitation medicine within NAPA we want to exchange experiences and knowledge about the cooperation with the rehabilitation doctor and how it can be designed. Looking at the developments within rehabilitation medicine in his cooperation lie chances to focus on efficiency, network-rehabilitation, care in the right place, at the right time as these become more important. By presenting scientific research, best practices by medical doctors and PA's working in rehabilitation medicine and a colleague-specialism our aim is to share experiences. Ultimately we want to improve the efficiency and scope of the collaboration. Through this we aim to create tools to strengthen the collaboration locally and nationwide. Program: 20 min M. Babovic, director NAPA. Task reallocation: developments and scientific research 20 min Dr. Verhagen, MDL specialist. Task reallocation brings medical doctor and PA nearer together 20 min Cooperation in daily practice and scientific research by the PA 20 min Paneldiscussion based on propositions

**Session Moderator:**

- Y.T.A. Troe
- B.E.A.M. Vliexs

**Session Presenter(s):**

- M. Babovic
- M.A.M.T. Verhagen

**Abstract Titles:**

- Task-reallocation: developments and scientific research
- Taks reallocation brings medical doctor and PA closer together

## **C8. Mini Symposium: Permissive weight-bearing: the next step**

**Session Topic:** Walking - mobility, Walking - mobility, Trauma rehabilitation, Trauma rehabilitation

### **Session Description:**

This mini-symposium will be a sequel of the mini-symposium we held 4 years ago at the DCRM. ( 2015: Customized weight-bearing protocol after orthopaedic trauma.) At that time we noticed that the discussion with our rehabilitation specialist was more intense than we expected, but also more intense than the discussions we had that same year with the traumatologists at the Traumadagen. Why a sequel? We believe in our protocol and strive for it to become usual care. Our ongoing research and innovative collaboration between rehabilitation specialists, paramedics and trauma-surgeons in our region gives us an unique position to reach our goal. Our concept of working together to treat the patient the same way in all rehabilitation settings ranging from primary healthcare to specialised rehabilitation care is not known anywhere else. We will present the outcome of our latest research and publications. We will also discuss how this collaboration works and why we think it is a success. Each member of our group has a different role in our collaboration. Furthermore in recent years we also started giving lectures and courses to physiotherapists in primary care in our region regarding our protocol and stepped-care approach. The way we treat our patients is constantly discussed starting from the decision whether to perform surgery or not to the patients progress in rehabilitation by different members of our group in an allied health therapy approach in the hospital and in the rehabilitation centre. Because of the discussion necessary for our presentation we would like to present this mini-symposium in Dutch.Hr. P.H.S. Kalmet, PhD traumasurgery houdt een voordracht met discussie (30 minuten): preliminary results of a multicentre trial: Permissive weight-bearing vs usual careHr. T.J.Blokhuis, traumasurgeon, Hr. GJ Maas, physiotherapist, Hr. P.W.A. Mijtjens, rehabilitation specialist houden een voordracht met discussie (45-60 minuten): teamwork in traumarehabilitation: why and how does it work

### **Session Moderator:**

- Y.Y. van Horn

### **Session Presenter(s):**

- P.H.S. Kalmet
- T.J. Blokhuis

### **Abstract Titles:**

- preliminary results of a multicentre trial: Permissive weight-bearing vs usual care
- teamwork in traumarehabilitation: why and how does it work

## PARALLEL SESSION D – DEBATE AND PHD THESIS SESSION

### D1. PhD thesis session: Presentations of the best PhD theses in the Netherlands

*Chair: prof. Jeanine Verbunt MD PhD*

During the DCRM 2019 in Utrecht the best PhD theses in the field of rehabilitation medicine in the academic year 2018-2019 are presented. Afterwards the jury will select the winner of the PhD Award Rehabilitation Medicine 2019.

The three nominees for the prize are:

- Expose or protect? Fear of movement-related pain in Complex Regional Pain Syndrome Type I – Marlies den Hollander
- Biofeedback to Improve Gait in Children with Cerebral Palsy - Adam Booth
- Physical Therapy for patients in the intensive care unit – Juultje Sommers

The PhD Award Rehabilitation Medicine is a prize awarded annually for the best and most appealing doctoral thesis in the field of rehabilitation medicine in The Netherlands. The aim of this prize is to value and further high-quality research and to put the researchers into the limelight.

#### **Biofeedback to Improve Gait in Children with Cerebral Palsy - Adam Booth**

As a result of complex brain impairment, the action of walking presents a significant challenge for many children with cerebral palsy. Given the importance of walking in the activities of daily living it should be considered a key target of rehabilitation. Developing technologies can be harnessed to drive improvements in rehabilitation techniques. One such avenue may be through the use of real-time biofeedback, in immersive virtual reality, to help individuals understand how they can adapt and improve their walking pattern. The overarching aim of this thesis is to establish the extent to which children with cerebral palsy can improve their gait through the novel use of biofeedback on gait. The findings of this thesis show that gait training can be effective to improve long term functional outcomes in children with cerebral palsy, with intuitive biofeedback visualised by an avatar, children can improve gait in an immediate response, and a clinically feasible game for biofeedback was developed to allow long-term training. The thesis provides insights into the use biofeedback as a promising tool in rehabilitation with the potential to enhance gait assessment and improve gait related outcomes.

#### *Short resume*

Adam Booth completed his PhD in Amsterdam in a collaboration between the VU Medical Center and Motek. His research has focused on developing innovative methods for biofeedback on gait in children with cerebral palsy. By challenging gait with biofeedback, he hopes to make rehabilitation more rewarding for patients in addition to helping clinicians in their understanding of the underlying causes of gait impairment.

He now works at Motek, developing the potential of technology to improve rehabilitation and enhance quality of life for individuals across the spectrum with gait impairment.

#### **Expose or protect? Fear of movement-related pain in Complex Regional Pain Syndrome Type I – Marlies den Hollander**

Exposure in vivo (EXP) aims to reduce disability by challenging fearful expectancies about the consequences of pain and activities. A randomized controlled trial in patients with Complex Regional Pain Syndrome Type I and fear of movement-related pain (N=46) showed that EXP is more effective than a pain-contingent treatment in reducing disability, pain experience, pain-related fear, and in improving quality of life. A cost-effectiveness study revealed that, despite higher initial treatment costs, EXP significantly reduced healthcare costs and showed a tendency to lower work absenteeism and reduce societal costs, compared to pain-contingent treatment. Furthermore, the cost-effectiveness planes were all in favor of EXP. A single case experimental design was used to study generalization of EXP. After EXP, patients dare to perform new activities that were not performed during treatment, irrespective of whether they performed only a few activities during treatment, or many different activities only once. Exposure to multiple activities was preferred over repeated exposure to reduce

catastrophizing, pain-related fear, and experienced pain. An experimental study in healthy subjects replicated acquisition, extinction, and return of experimentally conditioned fear of movement-related pain, but an additional verbal/visual manipulation on the threat-value of pain failed to generate additional effects.

#### *Short Resume*

Marlies started her career as occupational therapist and studied Health Sciences additionally. After obtaining a Master's degree in Mental Health in 2006, she started to work as a psychologist in Maastricht University Medical Center. In 2009, she started as part-time PhD-student in the RE-move-project focusing on the effectiveness of exposure in vivo in patients with Complex Regional Pain Syndrome Type 1 and pain-related fear. Due to an additional experimental study in cooperation with the Research Group on Health Psychology at Leuven University, the project became a joint doctorate. In October 2018, she successfully defended her thesis. Marlies is currently working as senior-researcher at Adelante Centre of Expertise in Rehabilitation and Audiology, besides her clinical work at Adelante location Maastricht University Medical Center. Her current research interests are the mechanisms of exposure, and whether pain-related fear is present in other diagnoses associated with chronic pain, such as breast-cancer and spinal cord injury.

### **Physical Therapy for patients in the intensive care unit – Towards safe and purposeful physical therapy practice for critically ill patients - Juultje Sommers**

Many ICU survivors of critical illness and treatment in an Intensive Care Unit (ICU) develop muscle weakness and reduced exercise tolerance. Early rehabilitation for ICU patients has been advocated to prevent physical deterioration. However, knowledge on safe and effective rehabilitation interventions for ICU patients is lacking. The aim of this thesis was to contribute to the gaps in knowledge on physiological changes and muscle activity in ICU patients during exercise, and to develop a clinical guideline for safe and effective physical therapy in the ICU. Based on the studies, we developed evidence based recommendations for physical therapy for patients in the ICU. These include safety criteria to guide physical therapy, guidance for the use of applicable and valid instruments to measure physical impairments and interventions of physical therapy. Finally, a new method of early rehabilitation, ambulation training with a body weight supporting treadmill, was investigated and proved to be feasible, safe and potentially effective.

### **D2. Debate: The Rehabilitation Landscape is changing; a call for collaboration between MSR and GRZ?**

*Chair: Hans Oosterkamp*

There is an ongoing discussion about the differences and similarities between the fields of Medical Rehabilitation (MSR) and Geriatric Rehabilitation (GRZ). In our daily practice as MSR representatives we are often confronted with the overlap and boundaries between our working field and that of the GRZ. In their inspiring keynote Anne Visser-Meily and Wilco Achterberg highlighted a number of issues and opportunities for both the MSR and the GRZ. In the debate session you have the opportunity to share your opinions, good practices and ideas about this interesting topic. We want to challenge you to discuss opportunities but also possible threats in the co-existence of MSR and GRZ. This will be done, by sharing our opinions about several propositions in a debate session led by the inspiring Hans Oosterkamp who you probably remember from previous DCRM debate sessions. See you all at the debate on Friday 8th November 10.40-11.40h.

## PARALLEL SESSION E – MINI-SYMPOSIA AND WORKSHOPS

### E1 Mini Symposium: To educate the future doctor in Rehabilitation Medicine: Fun and Facts!

**Session Topic:** Education, Miscellaneous

**Session Description:**

Interest in Medical Education by medical staff is often limited. In order to keep sufficient rehabilitation doctors, we must enthuse the medicine student of today for our profession. Medical Education is the way to encounter the students and show them what it is all about. We are learning you examples of several approaches towards Medical Education in Rehabilitation Medicine. Medical Education in Rehabilitation Medicine (RM) is challenging for all of us. In this symposium we focus on how RM can be educated to medical students, clerkship students and interdisciplinary to residents of different medical specialities. We will focus on practises around the country with positive encounters of everyday practise. What can we learn from our residents and how to gets things done for the near future. Not only healthy living but also healthy education!

Chair: Prof GM (Clemens) Rommers, MD, PhD / M.Tepper MD Adelante Department of Rehabilitation Medicine University Medical Centre Maastricht

Programme:

00-10 Welcome and outline of the symposium: what can we learn from each other: interactive by phone. The start is with an on line question about learning in rehabilitation Medicine: Mentimeter survey about the question: what do you think good education in RM includes? Small discussion about the findings on the screen. Prof GM Rommers MD, PhD and M. Tepper MD

10-25 Mini education in five minutes: Mini education in five minutes: examples of speedy education in five minutes to residents, medical students. Ex. How to examine the hand in five minutes and how this is done. (to show that good education is not that time consuming) F.H. de Vries MD (Martini Hospital Groningen) of J.Bakker MD, PhD (Hospital Group North West)

25-40 The Education Class during Residency The education Class during residency: A former resident followed the educational class in Medical Education: information about education process for those interested in a more profound knowledge how medical education is used as a tool for development in RM. (we can include several questions to the public) Z. van Mechelen, MD, ( Adelante / Maastricht University Medical Centre)

40-70 What Lessons can RM learn from others? An overview Different eyes looking to the RM education: what can we learn from paediatrics about student involvement in your education and how to change for the better. Prof dr P.L.P Brand, MD, PhD (Groningen University)

70-80 What did we learn: interactive by phone What did we learn from the information: Mentimeter survey: towards learning goal of more education skills. (we maybe include info of the poster: RM education the faculty view). To sum up with the high five of skills needed. Discussion with the public. Prof GM Rommers MD, PhD and M. Tepper MD

80-90 High five for education: take home message and wrap up.

**Session Moderator:**

- C.G.M. Rommers

**Session Presenter(s):**

- C.G.M. Rommers
- F.H. de Vries
- Z. van Mechelen
- P.L.P. Brand
- M. Tepper

**Abstract Titles:**

- Welcome and outline of the symposium: what can we learn from each other: interactive by phone
- Mini education in five minutes
- The Education Class during Residency
- What Lessons can RM learn from others?
- What did we learn: interactive by phone

**E2. Workshop: Setting meaningful goals in rehabilitation**

**Session Topic:** Applicable to multiple dias..., Miscellaneous

**Session Description:**

Abstract. Goal setting is a key characteristic of modern rehabilitation. However, it remains a challenge to set goals which patients find personally meaningful. We have developed a practical tool to set meaningful goals in rehabilitation. The tool is expected to make rehabilitation more patient centered. Recent chaplaincy-based research has explored global meaning in rehabilitation patients. Global meaning was found to comprise five aspects: core values, relationships, worldview, identity and inner posture. It was also found that these aspects of global meaning affect rehabilitation motivation and decisions. We have used these findings to develop the tool to set meaningful goals in rehabilitation. The tool consists of three parts. (i) Exploring the patient's global meaning, in a session of the rehabilitation physician, chaplain and patient. (ii) Setting a meaningful overall rehabilitation goal derived from the client's global meaning. (iii) Setting specific rehabilitation goals that serve to achieve the overall goal. In the interactive workshop, (1) we present the tool and its background, (2) we share our experience in working with the tool, and (3) we ask for feedback and suggestions from the participants in the workshop on the tool. Program. In interactive presentations we present the tool and its background, and our experience in working with the tool. In the final part of the workshop, we ask for feedback and suggestions from the participants in the workshop. -

Introduction, prof. dr. Joost Dekker, 5 minutes - Global meaning in rehabilitation patients – drs. Elsbeth Littooij (chaplain), 20 minutes - The tool to set meaningful goals - drs. Suzan Doodeman (chaplain), 20 minutes - The rehabilitation perspective - prof dr. Vincent de Groot (rehabilitation physician), 20 minutes - Feedback and suggestions from the participants in the workshop, 25 minutes.

**Session Moderator:**

- J. Dekker
- V. de Groot

**Session Presenter(s):**

- E. Littooi
- S. Doodeman
- V. de Groot

**Abstract Titles:**

- Global meaning in rehabilitation patients
- The tool to set meaningful goals
- The rehabilitation perspective

**E3. Mini Symposium: Strengthening the developmental perspective in pediatric rehabilitation care for youth with cerebral palsy (CP): implementing the PERRIN results**

**Session Topic:** Participation/Quality of Life, Paediatric rehabilitation

**Session Description:**

In the past decades we performed the PERRIN study (Pediatric Rehabilitation Research In the Netherlands) in a national consortium of University Medical Centers, rehabilitation centers, and the patient organization CP Nederland. Informed by development curves from this large longitudinal cohort study (n=421), we will share new knowledge on developmental patterns of activities and participation of youth with CP growing into their late twenties, focusing on their capability to participate as well as actual performance in several domains. We address a broad scope of domains, from mobility, fine motor performance and self-care to social behavior, leisure activities, work and domestic life. In addition, we aim to understand which factors adolescents with CP perceive as supportive for their participation, by learning from their personal experiences, and we will discuss early predictors of future participation at adult age. In interactive discussions in this mini-symposium we will identify ways to implement development curves in pediatric rehabilitation care and to use the present knowledge to address the right factors and future outcomes at the right time during the development of youth with CP.

**Session Moderator:**

- M.E. Roebroek

**Session Presenter(s):**

- J. Dallmeijer
- M. van Gorp
- J. Verheijden
- J. Voorman
- M. Ketelaar

**Abstract Titles:**

- Introduction on a developmental perspective and the PERRIN longitudinal study outline
- Development curves of participation of individuals with CP into adulthood: capability and performance
- How to use development curves and focus on patterns of development in clinical practice? – Commentaries by CP Nederland & discussion in groups

- How to use development curves and focus on patterns of development in clinical practice? – Clinician's perspective & discussion in groups
- (How) do adolescents with CP manage to participate?, a qualitative participatory study (co-presenters: J. Verheijden, CP Nederland and M. van Gorp - Early predictors of future participation) & discussion in groups

#### **E4. Workshop: Working in networks... What, Why and How?**

**Session topic:** network medicine

**Session description:**

Network medicine is one of the four foundations of the vision document "The medical specialist 2025". The Netherlands Society of Rehabilitation Medicine (NSRM) encourages to work in networks. But what exactly is the definition of a network? Which types of networks exist and suit particular situations? Should rehabilitation physicians actively create and maintain networks and, if so, how?

Have you ever thought about these issues in daily practice? This workshop will discuss the types of networks that suit different situations and goals. In addition, we will discuss our own established networks to find examples of best practices for other regions.

Chair: Sandra te Winkel

Speakers: Joris Knobben

#### **E5. Mini Symposium: Manual wheelchair mobility: a continued future concern**

**Session Topic:** Walking - mobility, Applicable to multiple dias...

**Session Description:**

Being the most common form of manual wheeled mobility, handrim wheelchair use is physically straining and inefficient. Upper extremity overuse injuries and pain are frequently present in long term manual wheelchair users, and even already present in early rehabilitation. Optimal wheelchair mechanics and material, proper individualized fitting, and early skill acquisition and user training are thought to reduce the strain on the upper body and improve daily activities and participation. However, objective methods, to facilitate decision making on wheelchair mechanics fitting and to evaluate the effect of practice, are not common practice in rehabilitation or beyond. Over the past decades initiatives have been taken to come to a wheelchair 'gait' lab, which aims to provide systematic evaluation and monitoring of wheelchair mechanics, ergonomics - i.e. the user-wheelchair fit - training status and wheelchair propulsion style in dependence of disability, sitting characteristics and wheelchair configuration. This wheelchair 'gait' lab, combined with novel options for activity monitoring, facilitates the adequate fitting and training of wheelchair dependent persons, during and after rehabilitation. The combined implementation into daily practice is not self-evident. Specialists in this field will provide the state-of-the-art on different aspects of measuring manual wheeled mobility and provide guidelines how to optimize the individual wheelchair-user combination.

**Session Moderator:**

- L.H.V. Van der Woude

**Session Presenter(s):**

- R.J.K. Vegter
- M.T. Leving
- R. de Klerk
- R.M.A. van der Slikke
- W.H.K. de Vries

**Abstract Titles:**

- Wheeled mobility: a continued concern
- Wheelchair propulsion style and progress during early rehabilitation
- Esedda: a new wheelchair ergometer for evaluation & training
- The use of Inertial Measurement Units (IMUs) to measure daily life wheelchair propulsion
- Shoulder load during daily life wheelchair propulsion
- Wheeled mobility: a continued concern

**E6. Mini Symposium: Spasticity treatment in the right place: time to concentrate care?**

**Session Topic:** Walking - mobility, Walking - mobility

**Session Description:**

Abstract: The Dutch interdisciplinary guideline for treatment of acquired cerebral and spinal spasticity in adults was published in 2017. In this guideline, it was recommended that in the presence of generalized spasticity intrathecal baclofen therapy should be considered as an alternative for oral medication. In addition, surgical interventions are recommended to be considered as an alternative for focal spasmolysis and for the treatment of secondary contractures (e.g. surgical correction of pes equinovarus deformity to improve gait stability). The guideline further states that both these invasive treatment modalities should be indicated and performed in a few centres of expertise in the Netherlands. More specifically, it was stated that these centres of expertise should be appointed by the involved scientific societies (rehabilitation medicine, orthopaedic surgery, neurology, neurosurgery, anaesthesiology) no later than November 2019. So far, however, no centres of expertise have been formally appointed, and no interdisciplinary agreements on the organization of care have been made. In this interactive symposium, we will introduce both topics by leading authorities in the field and discuss why and how surgical interventions and intrathecal baclofen therapy should be concentrated in the Netherlands.

**Session Moderator:**

- S.A.C.H. Geurts

**Session Presenter(s):**

- J. Nonnekes
- J.H. Buurke
- J. Fleuren
- H. Moser

**Abstract Titles:**

- Surgical interventions to improve gait capacity: time to concentrate care?
- Intrathecal baclofen treatment: time to concentrate care?

**E7. Mini Symposium: Targeted offloading with rocker profiles**

**Session Topic:** Walking - mobility, Diseases of the musculos...

**Session Description:**

Abstract: Rocker profiles have an effect on biomechanics of gait and with that they can be used in the treatment or prevention of many ankle-foot problems. The impression exists that in daily practise the design is limited to the position of the apex, proximal, at, or distal of the MTP-region. However, at least 7 design parameters of rocker profiles influence biomechanics of gait specifically, like sole stiffness, apex position, apex angle and rocker angle/radius of the heel- and forefoot rocker. In this symposium the biomechanical working mechanisms related to these design parameters of rocker profiles will be explained, and research applying these mechanisms will be presented. This will provide the attendants with up-to-date ideas, not earlier presented, on how to use the rocker profile in patient care. New scientific developments in redistributing pressure at the plantar surface of the feet in diabetic neuropathy will be shown. Also the use of biomechanical model of the plantar fascia to determine the forces on this structure with and without the application of a rocker profile will be presented and clinical value of rocker profiles in both plantar fasciitis and Achilles tendinopathy will be presented.

**Session Moderator:**

- J.M. Hijmans

**Session Presenter(s):**

- C. Greve
- K. Postema
- L. Van Kouwenhove
- J.M. Hijmans

**Abstract Titles:**

- Rocker shoes in plantar faciitis; effects & simulations
- Rocker shoes in Diabetes Mellitus; optimizing the shape for targeted offloading of plantar pressure
- Rocker shoes in Achilles tendinopathy; biomechacics of an optimized shape
- Rocker shoes in general; design parameters & biomechanics

## **E8. Workshop: Keep on training with ReVi! An e-health application to support individualized home-based aerobic training.**

**Session Topic:** E-Health/ Tele-medicine, Applicable to multiple dias...

### **Session Description:**

In this workshop we will learn participants how to make use of 'Keep on training with ReVi' (ReVi), an e-health application that gives patients with neuromuscular diseases (NMD) support during their individualized home-based aerobic training program. To prevent or reverse deconditioning, aerobic exercise is often part of rehabilitation treatment in patients with chronic diseases, such as NMD. Performing the training program in the home environment reduces the amount of travelling (and therewith the burden on patients), as well as healthcare related costs. However, due to a lack of guidance and motivation, patients experience difficulties in completing their home-based training program. Also, there is a high risk that training is inadequately performed leading to under- or overtraining. Therefore we developed ReVi, for which we received the 'Ipsen award for Innovative Patientcare in Rehabilitation 2016'. ReVi supports patients during their home-based training sessions according to B-FIT, an individualized aerobic training program specifically developed for slowly progressive NMD. ReVi gives real-time feedback on the (dis)agreement between the actual and the designated training intensity. Verbal encouragements stimulate patients to complete their training sessions, and an online dashboard allows practitioners to monitor training progress. The usability of ReVi is currently evaluated in a cohort of individuals with varying NMD. Programme. 1) The road to ReVi. Introduction to how previous work of our research group led to the development of ReVi. 2) Development of ReVi: lessons learnt. Sharing our experiences in working together with EverywhereIM, the company that build the app. 3) How to work with ReVi. Explaining the audience how ReVi can be optimally used. 4) The use of ReVi in clinical practice: results of a pilot. Discussing the use of ReVi in daily care, and the results of the pilot study. 5) Discussion/ending. Topics for discussion include: usability in other chronic diseases, safety, privacy.

### **Session Moderator:**

- E.L. Voorn

### **Session Presenter(s):**

- F.S. Koopman
- E.L. Voorn
- S. Oorschot
- T. Veneman

### **Abstract Titles:**

- The road to ReVi.
- Development of ReVi: lessons learnt.
- How to work with ReVi.
- The use of ReVi in clinical practice: results of a pilot.
- General discussion

## POSTERS

### P-1

#### **The effect of coping style and self-efficacy on anxiety, depression and life satisfaction in patient-partner couples after stroke**

J.J.E. Welten<sup>1</sup>, V.C.M. Cox<sup>1</sup>, W.J. Kruithof<sup>2</sup>, J.M.A. Visser-Meily<sup>2,3</sup>, M.W.M. Post<sup>3,4</sup>, C.M. Van Heugten<sup>5,6</sup>, V.P.M. Schepers<sup>2,3</sup>

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**Introduction:** The close relationship of stroke patients with their partners suggest an interdependency in their (emotional) functioning. In patient focused research, coping styles and self-efficacy have been shown to affect emotional health of the patient.

**Objective:** The aim of this study was to examine how patient-partner couples function regarding emotional health (anxiety, depression and life satisfaction) and how couples differ in coping style and self-efficacy. We also examine the inter- and intrapersonal effects of coping style and self-efficacy on emotional health within couples.

**Patients:** 215 couples (stroke patients and their partners).

**Methods:** Data was used from the multi-center longitudinal Restore4Stroke Cohort Study. Coping styles, self-efficacy, anxiety, depression and life satisfaction were assessed using questionnaires (UPCC, UCL, GSES, HADS, LiSat). An Actor Partner Interdependence Model was used to assess the dyadic relationships within the couple.

**Results:** At 1 year post-stroke, symptoms of anxiety were present in at least one member in 33.9% of couples. Depressive symptoms were present in 31% of couples. Couples with no symptoms of anxiety or depression showed more active coping of patient and partner and higher self-efficacy scores of the partner ( $p < 0.05$ ).

Within the dyad, pro-active coping of the patient was associated with lower anxiety of the partner ( $p < 0.05$ ). Higher self-efficacy of the partner was associated with lower depression scores and higher life satisfaction of the patient ( $p < 0.05$ ).

**Discussion and conclusions:** Coping styles of both patient and partner are associated with the emotional functioning of the couple.

**Clinical message:** This study supports a family-based approach for treating post-stroke emotional problems in patients and partners.

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### P-2

#### **Study protocol of iHand clinical trial: the effect of 6-week assistance of ADL by a wearable soft-robotic glove on impaired hand function**

G.B. Prange<sup>1</sup>, C.D.M. Nikamp<sup>2</sup>, A.I.R. Kottink<sup>2</sup>, F. Bos<sup>3</sup>, M. Van Gulijk<sup>3</sup>, C.K. Van Der Sluis<sup>4</sup>, M. Van Der Broek<sup>5</sup>, M.H. Lunter<sup>5</sup>, V.G. Van Heijningen<sup>6</sup>, B. Onneweer<sup>7</sup>, J.M. Stolwijk-Swuste<sup>8</sup>, A.F. Ten Hoff<sup>9</sup>, S.M. Brink<sup>9</sup>, K.A. Kuijpers<sup>10</sup>, J.S. Rietman<sup>11</sup>, J.H. Buurke<sup>2</sup>

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**Introduction:** Various patient populations (e.g., orthopedic, spinal cord injured, rheumatic patients) frequently experience difficulties in performing activities of daily living (ADL) due to declined hand function. Assistive technology can contribute to functional independence by supporting ADL. Soft-robotic glove CarbonHand supports the hand during ADL by strengthening grip. Previous studies in older adults with self-perceived hand problems showed, besides direct assistance, improved hand function after 4-week use, suggesting treatment potential for rehabilitation populations.

**Research question:** What is the effect of assisting ADL with the soft-robotic glove for 6 weeks on hand function, dexterity, pain and quality of life in patients with impaired hand strength? Additionally, glove usage is recorded and user experiences are gathered.

**Trial design/ patients and methods:** A multicenter uncontrolled intervention study is conducted with three pre- and two post-intervention assessments (one-week, one-month follow-up). Seven Dutch rehabilitation centers will recruit 63 patients with chronic decreased hand strength. Patients will use CarbonHand during ADL at home during six weeks. Grip strength, endurance, Action Research Arm Test, Jebsen-Taylor Hand Function Test performance (without glove) and patient-reported outcomes (Michigan Hand Outcomes Questionnaire, Motor Activity Log, Numeric Pain Rating Scale, SF-36, EQ-5D) are compared pre-post. Questionnaires assess user experiences, glove usage is reported in diaries and read-out from the system. Approved by METC Twente (NTR: NL7651).

**Expected contribution to research and clinical practice:** Six-week use of the soft-robotic glove is expected to improve grip strength, endurance and dexterity. A therapeutic effect of the soft-robotic glove would introduce new methods to intensively train impaired hand function in daily life.

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**P-3**

### **Added value of patient-reported outcome measures to evaluate health status in the Dutch Acute Stroke Audit 3 months after stroke**

J.A. De Graaf<sup>1</sup>, J.M.A. Visser-Meily<sup>2,3</sup>, P.E.C. Passier<sup>4</sup>, L.J. Kappelle<sup>5</sup>, M.J.H. Wermer<sup>6</sup>, M.W.M. Post<sup>2,7</sup>

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**Introduction:** Currently, the modified Rankin Scale (mRS) is included in the Dutch Acute Stroke Audit (DASA) to evaluate health status 3 months after stroke. However, from a Value-Based Healthcare perspective the use of Patient-Reported Outcome Measures (PROMs) has been advocated.

**Objective:** To compare the added value of PROMs to the mRS to evaluate health status 3 months after stroke.

**Patients:** 360 consecutive stroke patients from 6 Dutch hospitals participated.

**Methods:** In this cross-sectional study the 5-dimensional EuroQol (EQ-5D-5L), Patient-Reported Outcomes Measurement Information System (PROMIS-10), Utrecht Scale for Evaluation of Rehabilitation-Participation Restrictions subscale (USER-P-R) and mRS were measured 3 months after stroke. For each PROM, the internal consistency, ceiling effects, correlations and discriminant ability between different mRS scores were calculated.

**Results:** The PROMIS-10 and USER-P-R showed the highest internal consistency ( $\alpha = 0.90$ ). Ceiling effects were observed in the EQ-5D-5L and USER-P-R. All PROMs strongly correlated with the mRS ( $r \geq 0.60$ ) and showed good discriminant ability between mRS scores. Discriminant ability in less affected (mRS 0 vs 1) and more affected (mRS 1 vs 2 and 2 vs 3-5) stroke patients was superior in the PROMIS-10 and USER-P-R respectively.

**Discussion and conclusions:** All PROMs showed added value to the mRS 3 months after stroke. The PROMIS-10 was sensitive to changes in less affected stroke patients, whereas the USER-P-R and EQ-5D-5L provided more information in more affected stroke patients.

**Clinical message:** We recommend the addition of a PROM to the DASA to evaluate health status 3 months after stroke. It depends on the setting and underlying goal which PROM is preferred.

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**P-4**

#### **Innovative assessment of cognition in daily-life activities (InDiCA study)**

I.K. Gosselt<sup>1</sup>, L.A. Spreij<sup>1</sup>, J.M.A. Visser-Meily<sup>1,2</sup>, T.C.W. Nijboer<sup>1,3</sup>

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**Introduction:** Neuropsychological paper-and-pencil tests lack ecological validity (i.e. degree in which daily-life functioning can be predicted) and have moderate sensitivity (i.e. mild cognitive deficits are often not captured). Cognitive performances on these tests do often not relate to subjective cognitive complaints patients experience in daily-life.

**Research question:** The aim is to examine the relation between cognitive skills, assessed with innovative test methods, and cognitive complaints during daily-life activities in patients with acquired brain injury (ABI).

**Trial design/ patients and methods:** The research protocol was approved by the Medical Ethics Committee of University Medical Centre (METC protocol number 19/112). Cognitive skills will be assessed using: (1) digital neuropsychological assessment (DNPA) and (2) Virtual Supermarket Task (VST). Cognitive complaints during daily-life activities are assessed using a cognitive complaints inventory (CoCo-P). Furthermore, general cognitive functioning (MoCA), participation (USER-P), cognitive and emotional consequences (CLCE-24), mood (HADS), severity brain injury (EQ6D) and self-efficacy (GSES) are assessed. These tests and questionnaires will be administered in 150 (former)outpatients with ABI and 50 healthy controls. Patients will be recruited via social media, medical centres (the University Medical Centre Utrecht and De Hoogstraat Rehabilitation Centre) and patient associations.

**Expected contribution to research and clinical practice:** Cognitive skills, assessed with test methods with a higher ecological validity, are expected to relate more to cognitive complaints, compared to a lower ecological validity (e.g., VST more than DNPA). More dynamic measures (i.e., fluctuations over time) are expected to relate more to cognitive complaints than static traditional measures (e.g., total time, total errors).

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## P-5

### **Time to wake up! Healthcare providers' education, knowledge and clinical practices regarding sleep**

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**Introduction:** Sleep plays a critical role in child health and development, and the prevalence of sleep disorders is high in children with disabilities. Sleep is greatly underemphasized in paediatric rehabilitation.

**Objective:** This study was designed to assess the education and knowledge about sleep of health care professionals (HCP) and application of sleep health practices in paediatric rehabilitation.

**Patients:** -

**Methods:** A semi-structured survey was conducted among HCPs (doctors, residents, therapists) working in paediatric rehabilitation. The survey consisted of 41 questions related to sleep education, knowledge about sleep physiology and sleep disorders, and sleep health practices.

**Results:** A total of 44 HCPs completed the survey.

**Education:** Among the HCPs, 83% received between 0-5 hours of sleep education during training. More than 70% rated this as not sufficient.

**Knowledge:** Almost half of HCPs rated their knowledge of sleep medicine as insufficient to use in clinical practice. Two-third of sleep knowledge questions was answered incorrectly.

**Clinical practice:** Less than a quarter (18%) of HCPs pays attention to sleep in clinical practice only once a week or more, and is limited to sleep hygiene, medication and referral.

**Discussion and conclusions:** Sleep knowledge and sleep health practices in paediatric rehabilitation are limited. Insufficient sleep education may be a strong contributor to these findings. HCPs may lack confidence in identifying and managing sleep disorders.

**Clinical message:** It is time to wake up: we need to recognize the importance of sleep, integrate sleep medicine knowledge into the education curriculum and address sleep during patient and parent encounters.

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## P-6

### **Congruent Movement Training: a randomized controlled trial in neglect patients**

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**Introduction:** Approximately 30% of all stroke patients show visuospatial neglect (VSN). Currently, Visual Scanning Therapy (VST) is applied in clinical settings to attenuate neglect symptoms. VST builds on the premise that eye movements to the affected hemifield lead to a concurrent shift of visual attention which attenuate VSN symptoms. Congruent movements with different effectors of the motor system, e.g. eye and hand, can produce an even larger boost of attention compared to a single

effector. Therefore, an intervention with congruent eye and hand movements may result in greater attenuation of neglect compared to an intervention with single eye movements as applied in standard VST.

**Research question:** The current RCT will investigate the beneficial effects of this updated version of VST by comparing changes in performance on standard neuropsychological neglect tasks and severity of neglect in activities of daily living (ADL).

**Trial design/ patients and methods:** Thirty VSN patients in the subacute phase post-stroke onset will be randomly assigned to one of two groups: congruent eye and hand movement training (experimental group) versus standard VST (control group). Each patient will receive 10 sessions of training, 30 minutes each, within two weeks. Performance on standard neuropsychological neglect tasks, a visual discrimination task, severity of neglect in ADL and eye movement characteristics before and after intervention will be compared for and between both groups.

**Expected contribution to research and clinical practice:** If congruent movement training leads to a larger shift in attention and more attenuation of neglect symptoms than standard VST, it can be implemented as a treatment for neglect.

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## P-7

### **Current use of telehealth in ALS care and determinants of implementation: A systematic review**

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**Objective:** We aimed to provide an overview of telehealth implemented/used in ALS care and determinants that have positively or negatively influenced the implementation of telehealth.

**Search strategy:** We searched Medline, Embase and Google Scholar to identify relevant published articles up to 01 January 2019.

**Selection of articles:** Full-text articles in English with original research reporting on the use or implementation of telehealth in ALS care were included. Two authors independently screened articles based on the inclusion criteria.

**Optional: Evaluation of articles and results:** 13 articles were included that investigated three types of telehealth: Videoconferencing, telephone-assisted self-monitoring and automatic remote monitoring. Telehealth mainly focused on monitoring non-invasive ventilation and respiratory function in patients in later disease stages. Most frequently reported barriers of telehealth were technical issues and organizational constraints (lack of reimbursement, big initial investment, provision of training/support). At the level of the user lack of personal touch was perceived as a barrier, but mostly facilitators for implementation were reported such as user-friendly system, reduced travel burden, more continuity of care.

**Conclusion:** To optimize the use of telehealth in ALS care, telehealth should be initiated in earlier disease stages with monitoring of all relevant domains of functioning. Determinants identified for

telehealth in ALS correspond to known barriers and facilitators to the implementation of telehealth in general. There is a lack of reporting on determinants of implementation in current literature. To facilitate telehealth integration in ALS care, future research should report more on the barriers and facilitators of implementation.

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## P-8

### **Psychometric assessment of the PROMIS Scale v1.2 Global Health in the general Dutch population: an Item Response Theory analysis**

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#### **Introduction: -**

**Objective:** To perform a psychometric assessment of the Dutch-Flemish Patient-Reported Outcomes Measurement Information System (PROMIS®) Scale v1.2 Global Health (PROMIS-GH).

**Patients:** The 10-item Dutch-Flemish PROMIS-GH was administered online to a random sample from the general Dutch population.

**Methods:** Confirmatory Factor and Item Response Theory (IRT) analyses were run to study dimensionality, local dependence, monotonicity, IRT-model fit of the 4-items Global Mental Health (GMH) and 4-item Global Physical Health (GPH) subscales. Measurement invariance was studied by evaluating Differential Item Functioning (DIF) for age, gender, and language (Dutch versus English).

**Results:** A total of 4370 persons (mean age±SD 51.3±16.6y.; 47.3% male) participated. Unidimensionality (GMH: CFI=0.984; TLI=0.952, RMSEA=0.219; GPH: CFI=0.991; TLI=0.973; RMSEA=0.116) and local independence (all residual correlations<0.20) were supported. Monotonicity (GMH: H=0.602; PGH: H=0.537) was sufficient. The data fitted to the model (GMH: RMSEA=0.026; GPH: RMSEA=0.019). However, all items exhibited misfit to the GRM-model (S-X<sup>2</sup> p-values<0.0001). After adjusting for type-I error, by creating ten random samples of 437 subjects, ten analyses showed good fit-to-the-model for all items (p≥0.001) except for the GMH items Global02, Global04, and Global05 (p<0.001, one analysis) and Global10r (p<0.001, six analyses), and the GPH item Global07r (p<0.001, one analysis). Global08r showed DIF for age. No DIF for gender or language was found.

**Discussion and conclusions:** GMH and GPH exhibited sufficient psychometric performance in a Dutch general population sample. However, the GMH could be improved as Global10r showed GRM-model misfit.

**Clinical message:** The Dutch-Flemish PROMIS-GH can be used to measure global health in the general Dutch population.

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## P-9

### **Inter-rater reliability and feasibility of the Motricity Index and the Trunk Control Test in hospitalized patients with a primary brain tumor**

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**Introduction:** The guidelines for stroke rehabilitation, recommend to use a coreset of bed side tests for assessing muscle strength, trunk stability and balance. The tests in the coreset are important predictors for sitting, standing and ADL activities. Reliability and feasibility of these tests are excellent for the stroke patient population in the acute phase. Many physiotherapists already use the same tests to assess functioning in patients with a primary brain tumor while hospitalized. Clinimetric properties of these instruments are not investigated for this population yet.

**Objective:** The aim of this study is to assess the inter-rater reliability and feasibility of the Motricity Index and Trunk Control Test, the most frequently used tests of the stroke coreset, in patients with a primary brain tumor.

**Patients:** with a primary brain tumor hospitalized in the University Medical Center Utrecht.

**Methods:** Thirty patients were assessed independently by two physiotherapists. Informed consent was obtained before assessment. Both assessments were executed within four hours to minimize the influence of fatigue. Intra class correlations coefficients were calculated. Feasibility was investigated by taking notes and recording adverse events.

**Results:** High correlation class coefficients were found for the inter-rater reliability, all above .90. Some patients reported fatigue after the assessments. All assessments were safely executed.

**Discussion and conclusions:** Inter-rater reliability of these bed side tests is high and comparable to the stroke patient population in the acute phase. Applying both tests is feasible.

**Clinical message:** The Motricity Index and Trunk Control Test are reliable and feasible to use in hospitalized patients with a primary brain tumor.

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## P-10

### **Influence of premorbid sports participation on daily physical activity level after cardiac rehabilitation**

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**Introduction:** Physical activity (PA) is important in the secondary prevention of coronary artery disease (CAD). Nevertheless, adherence to PA is low and only little is known about the determinants of PA after CAD.

**Objective:** To explore if premorbid sports participation is predictive of PA after completion of cardiac rehabilitation (CR). Secondary we explored if PA at start is predictive of PA outcomes after CR.

**Patients:** We included 399 patients with CAD participating in a 3-month CR program.

**Methods:** Data on premorbid sports participation was retrospectively collected with a self-designed questionnaire. Subjects performing activities of  $\geq 3.0$  METs during  $\geq 2$  days per week were considered sports participants. Time spent in moderate-to-vigorous PA (MVPA, expressed as a percentage of

wear time) at start, after completion of CR, and at 18-months follow-up was objectively measured with an Actigraph GTX3+ .

**Results:** Multiple linear regression revealed that premorbid sports participation was not a predictor of MVPA at the end of CR ( $B=.046, p=.895$ ) and at 18-months follow-up ( $B=.006, p=.983$ ). MVPA at start was a predictor of MVPA at the end of CR ( $B=.642, p < .000$ ) and at 18-months follow-up ( $B=.552, p < .000$ ).

**Discussion and conclusions:** Our findings suggest that self-reported premorbid sports participation is not a predictor of PA after CR. Objectively measured PA at start appeared to be a predictor.

**Clinical message:** Patients with low PA at start of CR are at risk of having smaller benefits of CR and may need extra guidance.

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## P-11

### **The potential benefit of subsymptom threshold exercise training (SSTET) in reducing vegetative symptoms after acquired brain injury: an explorative case series**

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**Introduction:** Exercise induced vegetative symptoms after acquired brain injury (ABI) can limit increase of physical activities during rehabilitation treatment. Previous studies show reduction of vegetative symptoms after mild traumatic brain injury in athletes using subsymptom threshold exercise training (SSTET).

**Objective:** Investigate the potential value of SSTET in reducing exercise induced vegetative symptoms after ABI in adults.

**Patients:** Adults with exercise induced vegetative symptoms after ABI (including cerebrovascular accidents, traumatic brain injury), in an inpatient and outpatient rehabilitation setting.

**Methods:** Heart rate at symptom exacerbation (threshold) was determined using a treadmill test. Patients trained five to six days a week on 80% of threshold heart rate, in blocks of four to six weeks, with endpoint: lack of exacerbation of symptoms. At the end of every block the treadmill test was repeated and vegetative symptoms were scored, using the graded symptom checklist (GSC).

**Results:** Twelve patients were included, six male, median age 41 years. Median GSC score decreased 4.7 points. The majority of patients trained one or two blocks. Ten (83%) patients increased the duration of the treadmill test (median 3.5 minutes). Six (50%) patients stopped training because they no longer experienced exacerbation of symptoms.

**Discussion and conclusions:** Although no clinically significant change in GSC score was found, 50% of the patients no longer experienced exacerbation of vegetative symptoms during exercise.

**Clinical message:** SSTET can be a useful training method for patients with ABI experiencing exacerbation of vegetative symptoms during physical activities.

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## P-12

### **Armed4Stroke: Allied Rehabilitation using caregiver MEDIated Exercises for Stroke, trial protocol**

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**Introduction:** Recovery of walking ability is an important goal for patients post stroke. Stroke rehabilitation is typically front loaded, with resources mainly focused on inpatient care. Consequently, stroke survivors and their caregivers experience the transition from inpatient care to the community as a hurdle. Support tapers off and the majority of stroke survivors become physically inactive. A recently conducted proof-of-concept trial showed that caregiver mediated exercises was feasible and safe. Patients and caregivers experienced a smoother transition to the home situation. It was also effective in reducing anxiety of patients and depression of caregivers.

**Research question:** 1: To assess the added values of the Armed4stroke program, consisting of caregiver mediated exercises, supported by tele-rehabilitation services, to improve the level of self-reported mobility at home. 2 To assess the added value on length of inpatient stay, activities of daily living and psychosocial measures.

**Trial design/ patients and methods:** Single-blind randomized controlled trial including 74 Stroke patients who follow in- or outpatient rehabilitation. Intervention to be investigated: During 8 weeks, couples are asked exercise minimally 5 times a week for 30 minutes. There are regular face to face sessions with the physical therapist. Couples will receive a tailor-made exercise program, containing task-specific exercises focusing on gait and gait related activities. The exercise program is progressive in nature and is developed to achieve important milestones for community ambulation.

**Expected contribution to research and clinical practice:** We believe that caregiver mediated exercise, supported with tele-rehabilitation is able to promote self-generated physical activity and to increase psychosocial outcomes in patients and caregivers.

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## P-13

### **PROMIS® Physical Function short forms perform at least as good as the 24-item Roland Morris Disability Questionnaire in patients with chronic low back pain**

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**Introduction:** -

**Objective:** To compare unidimensionality, item-level characteristics, scale-level reliability and construct validity of PROMIS® Physical Function short forms (PROMIS-PF) and 24-item Roland Morris Disability Questionnaire (RMDQ-24) in patients with chronic low back pain (LBP).

**Patients:** with non-specific LBP ≥3 months (n=768) from a secondary care center for rehabilitation and rheumatology .

**Methods:** Unidimensionality, item-level characteristics, scale-level reliability and construct validity of Dutch versions of the 4-, 6-, 8-, 10- and 20-item PROMIS-PF, and of the RMDQ-24 were evaluated.

**Results:** Mean age $\pm$ SD was 49 $\pm$ 13y., 77% female, 54% displayed pain >5y. PROMIS-PF-6, PROMIS-PF-8 and RMDQ-24 exhibited sufficient unidimensionality (confirmatory factor analysis: CFI >0.950, TLI >0.950 and RMSEA <0.060) whereas others did not. All instruments were free of local dependence except PROMIS-PF-20 with four item pairs with residual correlations. Mokken scale analysis found one non-monotone item for PROMIS-PF-20 and eight for RMDQ-24. PROMIS-PF-20 displayed two misfitting items (S-X<sup>2</sup> p-value >0.001). Two-parameter item response theory models found two items with low discrimination for RMDQ-24. All other instruments had adequate fit statistics and item parameters. PROMIS-PF-20 displayed the best scale-level reliability. Construct validity was sufficient for all instruments as all hypotheses on expected correlations and differences between relevant subgroups, were met.

**Discussion and conclusions:** PROMIS-PF-6, PROMIS-PF-8 and RMDQ-24 exhibited better unidimensionality, whereas PROMIS-PF-4, PROMIS-PF-6 PROMIS-PF-8 and PROMIS-PF-10 showed superior item-level characteristics. PROMIS-PF-20 was the instrument with the best scale-level reliability.

**Clinical message:** Some PROMIS-PF short forms may be preferred over the RDMQ-24 for clinical research and practice in LBP, especially considering that they are shorter instruments, providing less burden to patients.

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**P-14**

### **The case-mix of stroke patients treated in two rehabilitation centers**

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**Introduction:** Practice variation was found between two rehabilitation centers (RCs) delivering stroke rehabilitation. It is unknown whether this variation is influenced by differences in the case-mix.

**Objective:** To determine whether differences in the case-mix exist between two stroke RCs.

**Patients:** Consecutive stroke patients admitted to two RCs.

**Methods:** Relevant case-mix variables were based on the literature (e.g. International Consortium for Health Outcomes Measurements (ICHOM)). They included socio-demographic characteristics (i.e. age, sex, living situation, ethnic background (Dutch versus non-Dutch), level of education) and clinical characteristics (i.e. stroke type, stroke localisation, Barthel Index, aphasia, co-morbidity, pre-stroke lifestyle) that were gathered at start rehabilitation. Chi-Square and Mann-Whitney U tests were used to study case-mix differences between two RCs.

**Results:** 809 patients were included, of whom 707 filled in the baseline questionnaire (306 patients RC1). We found a statistically significant (p<0.05) difference between RC1 and RC2 regarding ethnic background (8% versus 15% non-Dutch), living situation (76% versus 70% living together), and aphasia (30% versus 15%). All other factors did not differ significantly between the RCs.

**Discussion and conclusions:** The RCs differed in their case-mix on a few characteristics. Case-mix variables such as stroke severity (NIHSS) are recommended by ICHOM to be included in the future.

**Clinical message:** It is important to take the following case-mix variables: ethnic background, living situation, and aphasia into account when studying the effect of practice variation on outcomes after

stroke rehabilitation as previous research found that those case-mix variables are associated with worse health outcomes after stroke.

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## P-15

### **Measurement properties of patient-reported outcome measures within chronic musculoskeletal pain: A mapping review**

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**Objective:** Patient-reported outcome measures (PROMs) enable patients with Chronic Musculoskeletal Pain (CMP) to rate their physical capacity, functioning or health-related quality of life. However, the quality of PROMs varies considerably and it is important to use PROMs with properly investigated and satisfactory measurement properties. This mapping review aims to outline the previous research on measurement properties of outcome measures in CMP.

**Search strategy:** The study protocol was checked at the International Prospective Register of Systematic Reviews (PROSPERO) and the results are reported based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR). Records were identified according to COnsensus-based Standards for the selection health Measurement INstruments (COSMIN) for systematic reviews of outcome measure instruments. Specific search queries were created to search multiple electronic databases.

**Selection of articles:** Two reviewers independently selected articles by title, abstract and full text according to predefined selection criteria. Disagreements between reviewers regarding inclusion of specific articles were resolved by involving another author. To be included, the articles had to present original data reporting the validity, reliability, responsiveness or interpretability of the included PROMs.

**Conclusion:** This review yields information on knowledge gaps regarding measurement properties of PROMs that are already in use for diagnostic, evaluative and prognostic purposes for clinical practice. The results aid planning and commissioning of future studies on psychometric properties and serves as input for studies to evaluate pain rehabilitation treatments that are often reimbursed by health insurance companies.

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## P-16

### **Differences in factors influencing the use of eRehabilitation among healthcare professionals: a comparison between Brazil and the Netherlands**

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**Introduction:** Despite growing insight in barriers/facilitators influencing the use of eRehabilitation in western countries, little is known about how these barriers/facilitators relate to non-western countries.

**Objective:** To identify differences and similarities in factors influencing the use of eRehabilitation between the Netherlands and Brazil.

**Patients:** Healthcare professionals

**Methods:** A survey including 88 statements about barriers/facilitators for the use of eRehabilitation (4-point scale; unimportant/important – disagree/agree) was conducted among Brazilian healthcare professionals (BHP) and Dutch healthcare professionals (DHP). Barriers/facilitators were ranked based on the importance to professionals from each country separately and top-10 most and least important statements were reported.

**Results:** 99 BHP and 102 DHP included physiotherapists, physicians and psychologists, mean age 41.0 (SD 8.5) and 46 (22.5%) male. Top-10 most influencing statements mostly differed (4/10 overlapping) between BHP and DHP, top-10 least influencing statements mostly overlapped (8/10). BHP were more influenced by benefits of the use of eRehabilitation for the patients, DHP by the feasibility of eRehabilitation. Four statements were ranked highly different between countries; more important for BHP were the possibility to use eRehabilitation offline, used by whole multidisciplinary team and including cognitive training; more important for DHP is that decisions made during consultations are integrated in eRehabilitation.

**Discussion and conclusions:** Where BHP were concerned about the technical aspects and content of the eRehabilitation, DHPs were concerned about the integration of eRehabilitation in current treatments.

**Clinical message:** Implementation strategies should incorporate that BHP were driven by the potential benefits of the use of eRehabilitation and DHP by the feasibility of eRehabilitation.

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## P-17

### **Perspectives of potential end-users on the use of trunk exoskeletons for people with low-back pain: a focus group study**

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**Introduction:** Psychosocial, psychological and physical factors influence incidence of low-back pain. Body worn assistive devices that passively support the user's trunk, i.e. exoskeletons, can be used to decrease physical loads and potentially reduce low-back pain. A user-centred approach improves health outcomes, increases user satisfaction and ensures usability. Still, previous studies have not considered psychological factors and the involvement of end-users.

**Objective:** The objective of this study was to identify criteria to be considered when developing an exoskeleton for low-back pain patients by exploring the perceptions and expectations of potential end-users.

**Patients:** We conducted focus group studies with low-back patients (n=4) and healthcare professionals (n=8).

**Methods:** Focus group sessions were audio-recorded, transcribed and analysed, using the General Inductive Approach. The focus group discussions included trying out a currently available exoskeleton. Questions were designed to elicit opinions about the device, desired design specifications and usability.

**Results:** Important design characteristics were comfort, individual adjustability, independency in taking it on and off and gradual adjustment of support. Patients raised concerns over loss of muscle strength. Healthcare professionals mentioned the risk of confirming disability of the user and increasing guarded movement in patients.

**Discussion and conclusions:** The focus groups showed that implementation of a trunk exoskeleton to reduce low-back pain requires an adequate implementation strategy, including supervision and behavioral coaching.

**Clinical message:** For healthcare professionals the optimal field of application, prevention or rehabilitation, is still under debate. Patients see potential in an exoskeleton to overcome their limitations and expect it to improve their quality of life.

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## P-18

### **Vocational Rehabilitation with or without Work Module for Patients with Chronic Musculoskeletal Pain and Sick Leave from Work: Impact on Work Participation**

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#### **Introduction:**

**Objective:** To study the relationship between interdisciplinary vocational rehabilitation with (VR+ program) or without (VR program) additional work module on work participation of patients with chronic musculoskeletal pain and sick leave from work.

#### **Patients: -**

**Methods:** A retrospective cohort study was conducted, with data retrieved from care as usual in seven VR centers in the Netherlands. The VR program consisted of multi-component healthcare (physical exercise, cognitive behavioral therapy, education, relaxation). VR+ additional components were case management and workplace visit. The dependent variable was work participation (achieved/not achieved). Independent variables were type of intervention (VR/VR+), demographics, clinical, and work-related (return to work [RTW] expectation, sick leave duration, working status, job strain, and job dissatisfaction). Multivariate logistic regression analyses were applied on discharge and six-months follow-up.

**Results:** Of the 142 patients included, 26% received VR and 74% VR+. Both programs increased work participation at six-months follow-up (VR 80%, VR+ 86%). There were non-significant relationships between type of intervention and work participation on discharge (OR 1.0,  $p = 0.99$ ) and six-months follow-up (OR 1.3,  $p = 0.52$ ). RTW expectation was the only significant independent factor in the multivariate model on discharge (OR 2.9,  $p = 0.00$ ) and six-months follow-up (OR 3.0,  $p = 0.00$ ).

**Discussion and conclusions:** Both programs led to increased work participation. The addition of a work module to the VR program did not lead to significant increase in odds of work participation at discharge and six-months follow-up. This finding was probably due to a lack of contrast between the two programs.

**Clinical message: -**

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**P-19**

### **How to determine exercise tolerance in patients with Facioscapulohumeral Muscular Dystrophy? A pilot study**

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**Introduction:** More than 60% of patients with Facioscapulohumeral muscular dystrophy (FSHD) experience severe fatigue, affecting daily life activities. Aerobic exercise training lowers levels of fatigue but effects on exercise tolerance are unknown as measurement instruments are based on the healthy population. Surface Electromyography (sEMG), focusing on muscle fatigue, the limiting factor during exercise in FSHD patients, could be a promising instrument to measure exercise tolerance in these patients.

**Objective:** To search for a reliable and reproducible method for determining the exercise tolerance in people with FSHD with the hypothesis that a measurement instrument on the muscular level will be better able to reliably determine exercise tolerance in patients with FSHD.

**Patients:** 12 healthy participants (8 women, 4 men) with various fitness levels between the age of 25-59.

**Methods:** Pilot study consisted of incremental cardiopulmonary exercise test combined with sEMG (Vastus Lateralis/Medialis), Borg-scale, lactate levels. Anaerobic threshold (AT) + sEMG threshold were determined and compared.

**Results:** All participants reached AT, which showed an 0.8 correlation with sEMG thresholds, comparable to previous studies.

**Discussion and conclusions:** sEMG seems a reliable alternative to determine AT on muscular level in healthy subjects. We expect that FSHD patients reach the sEMG threshold earlier than the AT threshold during exercise. Further research is currently performed in FSHD patients.

**Clinical message:** sEMG could be a promising measurement for exercise tolerance in FSHD patients and provides us with better insight on muscle fatigue and with that, the option to individualize training programs and improve daily life activities.

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**P-20**

### **Experienced complaints, activity limitations, and loss of motor capacities in patients with pure Hereditary Spastic Paraplegia: a web-based survey in the Netherlands**

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**Introduction:** Hereditary spastic paraplegia (HSP) is a group of inherited disorders, characterized by progressive lower limb spasticity (LLS). Treatment is often focused on reducing spasticity and its

physical consequences. However, rehabilitation should also focus on experienced complaints, activity limitations, and loss of motor capacities to address individual patients' needs.

**Objective:** To investigate the experienced complaints, activity limitations, and loss of motor capacities in HSP patients to better understand the functional impact of their disease.

**Patients:** 109 patients with pure HSP.

**Methods:** A disease-specific online questionnaire.

**Results:** Patients experienced most burden or hindrance from muscle stiffness, balance problems and gait problems. Micturition and defecation problems were reported by 50% and 19%, respectively. Participants reported difficulties to perform certain motor capacities: 33% reported to use walking aids indoors, whereas 46% used walking aids outdoors; 57% reported a fall incidence at least twice a year ('fallers'); in 51% a fall had led to an injury at least once; 74% reported fear of falling. Duration of spasticity, comorbidity, wheelchair use, and the capacity to rise from the floor were independent predictors of being a 'faller'. Age, experienced gait problems, being able to stand for 10 minutes, and the capacity to open a heavy door had a strong association with being a 'walker without aids' (>500m).

**Discussion and conclusions:** The results emphasize the broad impact of spasticity on the lives of patients with HSP.

**Clinical message:** Spasticity in patients with HSP has a huge impact on motor capacities, performance of daily physical activities, and well-being.

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## P-21

### Health state improves after a 3 month training period with a powered exoskeleton in patients with spinal cord injury

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**Introduction:** Patients with a complete spinal cord injury (SCI) have an increased risk of health complications due to their obligatory sedentary life. The use of powered exoskeletons may have a beneficial effect on health state, because of the training possibilities in an upright position.

**Objective:** This study examined the potential health benefits to short-term exoskeleton training in patients with motor complete SCI.

**Patients:** Participants with chronic (>6 months) motor complete SCI (Th1-L1).

**Methods:** Twenty-two participants were given twenty-four training sessions over an eight week period with the ReWalk exoskeleton. Health questionnaires of general health status (*SF-36ww*; 0-800 scale) and bladder and bowel management (1-5 scale) were filled out prior to and after the training period.

**Results:** Eighteen participants completed the training program. General health state (*SF-36ww*) was significantly improved after the exoskeleton training period (*Mean*= 569.0, *SD* 136.3) compared to baseline (*Mean*= 617.1, *SD* 94.2),  $t(17) = -2.1$ ,  $p < .05$ . Improvements were seen on the *SF-36ww* subdomains for pain ( $p < .001$ ), social functioning ( $p = .03$ ), mental well-being ( $p = .04$ ) and general health perception ( $p = .04$ ). General satisfaction with bladder management improved from median 3 at baseline (range 1-5) to 4 (range 1-5) after the exoskeleton training ( $p = 0.02$ ). No change in bowel management satisfaction was seen ( $p = .11$ ).

**Discussion and conclusions:** Short-term exoskeleton training in motor complete SCI patients improved health state and bladder function satisfaction.

**Clinical message:** Eight weeks of powered robotic exoskeletons improves health state in SCI patients.

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## P-22

### **Hip surveillance in children with Cerebral Palsy; a retrospect of the last 10 years in the region Twente, Netherlands before implementing the Dutch guidelines for hip surveillance**

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**Introduction:** The introduction of surveillance programs, and subsequently preventive surgery have resulted in a reduction of hip dislocation from 15-20% to 0,5%<sup>1</sup>. This study focusses on how surveillance in the region Twente was practiced before implementing the newly introduced Dutch guidelines for hip surveillance (2018)<sup>2</sup>.

**Objective:** To determine 1) how many children with CP had timely X-rays, 2) whether interventions were adequately indicated and 3) how many children developed dislocated hip(s).

**Patients:** Children with (suspicion of) CP, born June 2006-June 2016, with > 1 consultation at Roessingh, Center for Rehabilitation were included.

**Methods:** Retrospective study of medical records, according to the newly introduced Dutch guidelines (2018)<sup>2</sup>.

**Results:** 89 cases were included (GMFCS 1-5); 37% of them had a timely initial X-ray; 62.5% had timely X-rays during surveillance. Displacement (migration percentage >33%) occurred in 27 (30%, 23 children), dislocation in 4 (4.5%). 8 of the 23 children with displacement, had a total of 11 operations. Of 27 displacements, 81% of the decision making for intervention was adequately.

**Discussion and conclusions:** According to the new Dutch guidelines there is room for improvement with respect to initiating hip surveillance at an earlier age and adequate scheduling during follow-up. Ultimately the goal is to decrease incidence from 4,5% dislocation to the international standard of 0.5%<sup>1</sup>. Reasons for incomplete follow-up were comparable to those described in the Australian surveillance program<sup>3</sup>.

**Clinical message:** Every child with CP deserves an optimal policy aimed at prevention of hip dislocation. The new guidelines supports this policy.

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## P-23

### **Does custom-made footwear for indoor use increase adherence in people with diabetes at high-risk for ulceration?**

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**Introduction:** Footwear adherence is a known problem in people with diabetes who are at high ulcer risk. Adherence is lowest indoors, while patients are most active inside their house.

**Objective:** To investigate changes in footwear adherence following provision of custom-made indoor footwear in people who were non-adherent.

**Patients:** Custom-made indoor footwear was provided to 35 persons with diabetes, a previous foot ulcer and 'regular' custom-made footwear.

**Methods:** Adherence (percentage steps with footwear worn) was assessed indoors and outdoors at baseline, and one and twelve months after provision. Patients were classified as non-adherent when <80% of their steps were made in their prescribed footwear. Plantar pressures were measured in all pairs of custom-made footwear.

**Results:** 32 patients completed the baseline adherence measurements; 23 were non-adherent and 9 adherent. Complete one month follow-up was available for 19 non-adherent patients. Indoor adherence increased significantly (before: 42%; after: 64%;  $p < 0.001$ ), while outdoor adherence increased non-significantly (before: 87%; after: 91%;  $p = 0.213$ ). Adherence at 12 months is currently being evaluated. Peak plantar pressure in the forefoot regions was similar between regular and indoor custom-made footwear.

**Discussion and conclusions:** Custom-made indoor footwear significantly increases adherence one month after provision in people at high-risk of diabetic foot ulceration who were non-adherent to wearing their prescribed custom-made footwear. The indoor footwear has similar offloading quality compared to their regular custom-made footwear.

**Clinical message:** The combination of custom-made indoor and outdoor footwear might reduce the risk of foot ulceration in people with diabetes at high risk.

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## P-24

### Caregiving demands in parental care for children with Spinal Muscular Atrophy (SMA): a qualitative study into the parents' experiences

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**Introduction:** Spinal Muscular Atrophy (SMA) is a progressive neuromuscular disease that gradually leads to muscle weakness causing difficulties in walking, standing, sitting, swallowing and breathing. When parenting a child with SMA, parents are confronted with increasing caregiving demands.

**Objective:** To align parental needs and support, a qualitative study was conducted to understand caregiving demands, as experienced by parents.

**Patients:** In total, 22 parents of 18 children (aged: 2 months - 8 years) with SMA-type 1, 2 or 3 participated.

**Methods:** Fifteen face-to-face semi-structured interviews were conducted. Data was analysed using inductive thematic analysis.

**Results:** Three domains of caregiving demands were identified: 1) 'Management of the disease of SMA', 2) 'Creating life as comfortable or normal as possible' and 3) 'Creating family balance'. Parents reported that caregiving demands evoke feelings of fear, insecurity, loss of control, loss of the dreamed life, and guilt. In turn, these feelings have an impact on their own (mental) health. Furthermore, performing and balancing their caregiving demands are hampered.

**Discussion and conclusions:** Currently, health care is focussed on supporting parents in performing their caregiving demands whereas support in dealing with their feelings and thoughts about their child and caregiving is lacking/limited. Presently, psychosocial support is provided when psychosocial problems occur, a shift to a more proactive approach will improve care for parents and their children.

**Clinical message:** Monitoring caregiving burden, parents' experiences, and need for psychosocial support will provide healthcare professionals the possibility to discuss these issues and to start proactive psychosocial support when needed.

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## P-25

### The mini-BESTest as clinical test for balance problems after minor stroke; an item-wise comparison

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**Introduction:** There is limited knowledge about balance problems in persons who have sustained a minor stroke.

**Objective:** To investigate if and which aspects of dynamic balance control are impaired in persons with a minor stroke by conducting an item-wise analysis of the mini-Balance Evaluation Systems Test (mini-BESTest).

**Patients:** Seventy-five persons with a chronic (>6months) minor stroke ( $\geq 24$  points on the Fugl-Meyer Assessment lower-extremity) and fifty-one age-matched healthy controls were included.

**Methods:** Participants underwent the mini-BESTest, a 14-item dynamic balance scale (range: 0-28). An ANCOVA (correction for age) was used to compare the mean-total scores between groups. The percentages of individuals who reached the maximum score on each item were analyzed with a chi-square test.

**Results:** The mini-BESTest showed a lower mean-total score in the minor stroke group compared to controls ( $24.0 \pm 2.5$  vs.  $26.1 \pm 2.1$  points,  $p < 0.001$ ). The percentage of minor stroke individuals who scored maximally on a specific item was significantly lower compared to controls for the items: standing on one leg (49.3% vs. 82.4%,  $p < 0.001$ ), standing with eyes closed on foam surface (60.0% vs. 94.1%,  $p < 0.001$ ), walk with pivot turns (66.7% vs. 86.3%,  $p = 0.013$ ), compensatory backward stepping (40.0% vs. 62.7%,  $p = 0.012$ ), compensatory lateral stepping (53.3% vs. 72.5%,  $p = 0.030$ ) and timed up&go with dual task (45.3% vs. 66.7%,  $p = 0.018$ ).

**Discussion and conclusions:** Individuals with minor stroke showed abnormalities on all four subdomains (i.e., anticipation, reactive balance, sensory, gait) of the mini-BESTest, which points at clinically relevant balance problems.

**Clinical message:** The mini-BESTest is a sensitive test to detect subtle balance impairments in persons with a chronic minor stroke.

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## P-26

### Level of Independence in SCI patients; a one year follow-up

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**Introduction:** The Spinal Cord Independence Measure (SCIM) is included in the Amsterdam Spinal Cord Injury (AMS-SCI) cohort to quantify the ability to perform basic activities of daily living (ADL) in patients with SCI.

**Objective:** Aim of this study is to describe the course of the ability to perform basic ADL in patients with SCI during and 1-yr after rehabilitation.

**Patients:** Thirty-five inpatients with a recent SCI are included, of which 17 cervical, 10 thoracic and 8 lumbar lesions. Mean age is 58± 16.5 years (19 – 76); Nineteen females and sixteen males participated in this study. Mean clinical duration is 98± 76 days.

**Methods:** The SCIM (0 – 100) is measured at admission (T0) and discharge (T1) of inpatient rehabilitation and 1-yr after discharge (T2).

**Results:** Total SCIM score significantly increased from 49.9± 20.1 at T0 to 74.2± 18.6 at T1 (p<0.001). Mean total score at T2 (75.6± 21.0) was not significantly different from T1. The four sub scores of the SCIM showed a similar trend, except for indoor and outdoor mobility; which slightly improved after the clinical rehabilitation period (p<0.001).

**Discussion and conclusions:** As expected, SCI patients showed most improvement during their clinical rehabilitation period. After one year self-care, respiration-, bladder- and bowel function are more or less stable while an expected improvement in mobility functions was seen.

**Clinical message:** Monitoring patients during and after the rehabilitation period is very useful, it provides insight in changed or preserved functioning. Underlying factors should be investigated.

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## P-27

### What determines the discharge destination after hospitalization for traumatic brain injury? Outcomes of the Neurotraumatology Quality Registry (NetQuRe)

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**Introduction:** It is unknown which factors determine discharge destination after hospitalization for traumatic brain injury (TBI), which is important for receiving optimal care in the right place.

**Objective:** To study which outcomes are associated with discharge destination (defined as home, rehabilitation center or nursing home) after hospitalization for TBI.

**Patients:** 230 patients with moderate-severe TBI (GCS<13) were prospectively included at hospital admission, of which 70 died and 29 had missing outcomes, leaving 131 patients for analysis.

**Methods:** Outcome measures: age, GCS, Rancho los Amigos (RLAS), Montreal cognitive assessment (MOCA), Functional Ambulation Categories (FAC), Barthel Index (BI) and Aphasia Bedside Check (ABC). ANOVA and ordinal logistic regression analyses were performed.

**Results:** Of 131 patients, 44 (34%) were discharged home, 46 (35%) to rehabilitation centers and 41 (31%) to nursing homes. Outcomes on RLAS, FAC, and BI were significantly lower in patients discharged to nursing homes compared to rehabilitation centers, which were significantly lower compared to home destinations ( $p<0.005$ ). Age was significantly higher in nursing home patients compared to rehabilitation ( $p=0.014$ ). MOCA was significantly higher in patients discharged home compared to rehabilitation ( $p=0.002$ ). ABC and GCS were not associated with discharge destinations. Adjusting for FAC, BI and age, RLAS was independently associated with discharge destination ( $p<0.001$ ).

**Discussion and conclusions:** Accounting for independence (BI), mobility (FAC), and age, the level of cognitive functioning (RLAS), predominantly determines discharge destination.

**Clinical message:** Only one third of TBI patients benefits from medically specialised rehabilitation. RLAS is most useful to determine discharge destination after hospitalization for TBI.

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## P-28

### The Effect of Stroke on Fixation Characteristics and Attention Distribution during Visual Exploration: A Case Study

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**Introduction:** Stroke can lead to disorganized visual exploration patterns. This disorganized visual exploration might be caused by impaired visuospatial attentional processes, as visuospatial attention and eye movements are tightly coupled.

**Objective:** In this study we explored the effects of stroke on visual exploration, by measuring eye movements during the Cookie Theft picture description task.

**Patients:** Results of a patient suffered from ischaemic stroke in the right hemisphere were compared to a group of five healthy controls.

**Methods:** Subjects were asked to describe the picture in detail. We analysed the number of reported salient elements, total response time, fixation duration and fixation distribution.

**Results:** A decrease in average fixation duration was observed in the contralesional (left) visual field of the patient (179ms left vs 253ms right) compared to controls (292ms left vs 285ms right), while total response time was not different (80 s vs 87 s, respectively). The patient spent less time fixating than

controls, implying a relative increase in saccades, representing a more disorganized exploration pattern. Identification of salient elements (four left and four right) was not impaired, suggesting that this disorganized visual exploration in this patient was not caused by profound lateralized visuospatial attention deficits.

**Discussion and conclusions:** This case study shows that stroke can lead to disorganized visual exploration behaviour with less fixation time in the contralesional hemifield, without lateralized visuospatial attention deficits.

**Clinical message:** We suggest that studying eye movements during the Cookie Theft picture description task could be a useful tool in evaluating visual exploration and visuospatial attention in stroke patients.

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**P-29**

### **Barriers and facilitators for implementing eRehabilitation for stroke patients: a focus group study with healthcare professionals**

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**Introduction:** Although eRehabilitation interventions are potentially cost-effective in stroke rehabilitation, they are not widely implemented in rehabilitation practice.

**Objective:** To explore factors (i.e. barriers/facilitators) influencing the implementation of eRehabilitation in stroke rehabilitation according to healthcare professionals.

**Patients:** Healthcare professionals from one rehabilitation center.

**Methods:** Qualitative focus group design; two focus groups with professionals were audiotaped, transcribed and analysed using the six themes of Grol's implementation model: innovation, individual professional, patient, social, organizational and economic/political context.

**Results:** Thirteen professionals participated (4 physiatrists, 3 physical therapists, 3 occupational therapists, 1 speech therapist, 1 psychologist, 1 manager) and in total 419 quotes were extracted. Most quotes were categorised in the theme 'innovation' (n=215/419, 51%), with the subthemes 'advantages of practice' (n=121) and 'feasibility' (n=42) being most often reported. About a quarter of the quotes concerned the 'organizational' theme (102/419, 24%), whereby the subtheme 'resources' (n=61) was most often reported. The third most often mentioned theme concerned 'individual professional' (52/419, 12%), with subtheme 'knowledge' (n=15) most often quoted. Less than 12% of the quotes concerned the themes 'patient' and 'social' or 'economical/political context'.

**Discussion and conclusions:** The most often quoted theme influencing uptake and implementation of eRehabilitation programs concerned 'innovation', including advantages in practice and feasibility. Secondly, the 'organizational' theme was relatively often mentioned, next to the 'individual professional' theme.

**Clinical message:** In particular barriers and facilitators on the level of innovation, organization and individual professional must be addressed in future implementation strategies to increase the uptake of eRehabilitation in clinical practice.

## P-30

### **Early terminators in interdisciplinary pain rehabilitation: numbers, timing and reasons for early termination**

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**Introduction:** Substantial rates of patients terminating interdisciplinary pain rehabilitation (IPR) earlier than planned have been described. Little is known about the reasons for early termination of IPR, whereby unsuccessful rehabilitation is mentioned as one of the main reasons in literature.

**Objective:** To get insight in numbers, timing (part 1) and reasons (part 2) for early IPR termination.

**Patients:** Part 1: Patients who had followed IPR in 2015. Part 2: Early terminators from IPR in 2017-2018.

**Methods:** A multicenter study in 2 Dutch rehabilitation centers with a mixed method design. Part 1: A retrospective chart review. Part 2: Semi-structured patient interviews.

**Results:** Part 1: 137 of 428 patients (31.3%) had terminated early from IPR. The mean reduction in treatment duration was 5.5 weeks (median 5.3; IQR 5.0) with a mean planned treatment duration of 11.3 weeks (median 12.0; IQR 2.0). Part 2: Twenty interviews were held. Nine patients achieved all treatment goals earlier than initially expected. "No improvement/more pain" (4 patients) and "other expectations on the content of the program" (4 patients) were also mentioned as main reasons for early termination of IPR.

**Discussion and conclusions:** Almost one third of the patients terminated early from IPR, with a mean reduction in treatment duration of 5.5 weeks. The most frequent mentioned reason for early termination is "all treatment goals achieved earlier than expected".

**Clinical message:** Early termination in IPR does not have to be considered as negative by definition, because a substantial proportion of early termination appears to have a positive cause.

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## P-31

### **Higher body mass index is associated with lower foot health in patients with rheumatoid arthritis: AMS-foot cohort baseline results**

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**Introduction:** -

**Objective:** Obesity is highly prevalent in patients with rheumatoid arthritis (RA) with likely impact on weight-bearing foot joints. We explored the associations between body mass index (BMI) and measures of foot health in RA patients with foot complaints.

**Patients:** -

**Methods:** We examined RA patients presenting for their first custom-made therapeutic footwear or foot orthoses. Domains of foot health comprised: foot pain, foot-related activity limitations, forefoot plantar pressure, foot synovitis, and foot deformity. In regression analyses BMI was the independent, and foot health domains were the dependent variables.

**Results:** In 230 patients (80% female and mean age 58 years, disease duration 8 years and BMI 27.3 kg/m<sup>2</sup> small to modest statistically significant associations were found between a higher BMI and more foot pain, more foot-related activity limitations, higher in-shoe measured forefoot plantar pressure, and the presence of foot synovitis. No relations were found between BMI and barefoot measured forefoot plantar pressure or foot deformity.

**Discussion and conclusions:** BMI is negatively associated with foot health in RA. Although the clinical relevance of our findings for an individual patient is not immediately obvious, future research should consider BMI as a potential therapeutic target to improve foot health.

**Clinical message:** -

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**P-32**

### **Feasibility of structured and repeated application of outcome measures in patients with Amyotrophic Lateral Sclerosis (ALS), primary lateral sclerosis (PLS) and primary motor spinal atrophy (PSMA)**

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**Introduction:** Systematically measuring outcomes that are relevant for patients is a key element in value based rehabilitation.

**Objective:** To evaluate the feasibility of a comprehensive set of outcome measures in patients with ALS/PLS/PSMA

**Patients:** Consecutive patients admitted to an outpatient rehabilitation facility from 2016-2018.

**Methods:** Retrospective analysis of data gathered in routine care. According to a local protocol, a set of outcome measures (carousel) was to be recorded every three months by treating health professionals: Weight/length, ForcedVitalCapacity(FVC), PeakCoughFlow (PCF), ALS-Functional-Rating-Scale(ALS\_FRS), ALS-Severity-Scale\_Speech (ALSS\_SP), ALS-Severity-Scale\_Swallowing(ALSS\_SW), Drooling Severity and Frequency Scale in Parkinson(DSDF\_P)) Short Nutritional Assessment Questionnaire (SNAQ). Feasibility was defined as the proportion of patients with ≥1 successful 'carousels', i.e. ≥3 test results reported within the same week.

**Results:** From 2016, 52 patients with ALS/PLS/PSMA were treated (56% men; mean age start of rehabilitation (SD) 67(10,9)). In total 794 test results were collected, with 104 carousels being administered in 38 patients (73%). In 9 patients (17%) only incidental and in 5 (10%) no measurements were collected. The carousel test results concerned weight/length (76/104), FVC (72/104), PCF (75/104), ALS\_FRS (61/104), SNAQ (52/104), ALSS\_SP (81/104), ALSS\_SW (80/104), ALS\_DFDS (74/104). Incidental measurements mostly concerned weight/length (n=90), PCF (n=56) and FVC (n=54).

**Discussion and conclusions:** In almost three quarters of patients with ALS/PLS/PSMA in rehabilitation (part of) a comprehensive set of outcome measures could be administered. More research into the optimal composition and frequency and interpretation of test results is needed.

**Clinical message:** Routine, structured outcome assessment is relatively feasible, but more attention is needed regarding the use of data to inform the delivery of care.

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### P-33

#### **Prevalence of post-stroke pain and its relationship with mental functioning in the rehabilitation-based SCORE cohort (Stroke Cohort Outcomes of Rehabilitation)**

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**Introduction:** Post-stroke pain has a negative impact on quality of life. However, literature shows inconsistencies in prevalence, course and consequences of post-stroke pain.

**Objective:** To study the prevalence of post-stroke pain and its relationship with mental health.

**Patients:** Consecutive stroke patients admitted to a specialized rehabilitation centre.

**Methods:** At inclusion, three, six and 18 months patients completed questionnaires on perceived pain (upper extremity, general pain) and other Patient Reported Outcome Measures (PROMS). Mental functioning was measured with the Hospital Anxiety and Depression Scale (HADS) and the EuroQol5D (EQ5D). Primary outcomes were analysed using descriptive statistics. Differences in outcomes at three and 12 months between patients with and without pain at baseline were analysed using Student's t-test.

**Results:** Mean age at baseline was 60 years (61% males). Prevalence of upper extremity pain at inclusion, three, six and 18 months was respectively 34,7%, (n=137), 42,5% (n=234), 36,5% (n=97) and 36,1% (n=127). Pain prevalence elsewhere was 37,0%, 36,8%, 39,5% and 37,7% respectively. HADS and EQ5D at three and 12 months was significantly lower in patients without (upper-extremity) pain at baseline ( $p < 0.001$ ).

**Discussion and conclusions:** Post-stroke pain increases at three months, followed by a decrease. Pain at baseline is probably related to mental health at follow-up. Further research is warranted to understand the consequences of post-stroke pain and identify patients at risk for long-lasting post-stroke pain.

**Clinical message:** Post-stroke pain has a large impact and peaks after 3 months of rehabilitation.

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### P-34

#### **Effect of botulinum toxin and standardized after-treatment on walking efficiency in children with cerebral palsy**

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**Introduction:** Botulinum toxin treatment is applied to children with cerebral palsy (CP) to improve gait kinematics. It is often assumed that improved gait kinematics are associated with improvement of walking efficiency and consequently better walking ability, but little is known about the effect of botulinum toxin treatment on walking efficiency.

**Objective:** To investigate the influence of treatment with botulinum toxin in leg muscles on walking efficiency.

**Patients:** Nine patients, 7-12 years, with CP GMFCS I (n=2), II (n=6) and III (n=1) with walking problems.

**Methods:** Prospective, observational study. Treatment with botulinum toxin was followed by exercise therapy, and usually stretching exercises, orthoses and/or serial casting. Gait analysis (to measure knee-angles at midstance (MST) and terminal stance (TST)) and exercise analysis (6 minute walking test to determine energy cost) were performed before and after treatment.

**Results:** Walking efficiency did not change significantly after treatment. The mean improvement of the knee angle (n=12 treated legs) was 4 degrees in both MST and TST. There was no relation between improvement of knee-angles and improvement of walking efficiency (n=7 patients).

**Discussion and conclusions:** There was no statistically or clinically significant effect on walking efficiency of treatment with botulinum toxin and after-treatment. Most notable limitation of the study is the small number of subjects.

**Clinical message:** It may prove difficult to influence walking efficiency with botulinum toxin and after-treatment. Improvements of gait kinematics (knee-angle in MST and TST) do not necessarily lead to an improvement of walking efficiency.

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P-35

### Medical Education in Rehabilitation Medicine: The Faculty View

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**Objective:** How is Rehabilitation Medicine (RM) education implemented in the curriculum of medical students at the universities in the Netherlands?

**Search strategy: Design:** Exploratory survey of medical schools in the Netherlands. **Participants:** Participants included rehabilitation medicine consultants, patient teachers and medical educationalists of all eight medical schools in the Netherlands. **Methods:** A mixed methods approach was used by adopting coordinator experiences in combination with an on-line survey

**Selection of articles:** -

**Optional: Evaluation of articles and results: Results:** The Dutch medicine studies offer education over 6 years of training including a 3 year-bachelor phase and a 3 year- master. All participating medical schools offer some form of RM education in this curriculum. Content and duration varied widely. Apart from formal teaching every medical school is involved in faculty development and assistive courses in adjacent medical areas. Educational based teaching by an ICF approach is used in a variety of methods including summative assignments, lectures, small group teaching or personal patient encounter. In addition to the education formats, clerkships are offered all around the country. Research activities in RM are offered on every University. Testing specific physiatry knowledge and skills is integrated in a wide variety as well. Student feedback has indicated that experiential methods are preferred and a recurrent theme is understanding the relevance of rehabilitation for their own future practice. **Discussion:** RM is a part of the basic training for every future doctor.

**Conclusion:** RM education is present at all medical schools, variation in content and dosage is observed. Guidelines and support for implementing of RM education, knowledge and -skills are needed.

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## P-36

### **The well-being of caregivers of children with cerebral palsy (CP): is the glass half empty or half full?**

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**Introduction:** It is well-known that having a child with CP has impact on the family. Research so far mostly focused on negative impact.

**Objective:** To investigate which factors could potentially have a positive impact on wellbeing of caregivers.

**Patients:** 0-16 years old diagnosed with CP who have visited a physiatrist at Basalt rehabilitation The Hague/Leiden.

**Methods:** Cross-sectional design study using questionnaires, (i.e. PedsQL™ Family-Impact-Module (FIM:36 items/8 dimensions/score 0-100) and rehabilitation/care-experiences (VAS0-10)), filled out once by parents. FIM-outcomes were divided into groups according to impact-level: 1:score 0-25, 2:26-50, 3:51-75, 4:76-100. Linear regression analysis was used to determine which factors have a positive influence on family impact within these groups.

**Results:** 111 parents (82.9% mothers) of patients with median age of 11 (IQR=5,00) participated. Forty-six families of children with CP (23 had Gross-Motor-Function-Classification-System-level 1) reported relative low family-impact (FIM-group 4). Parents in this group reported significantly lower physical ( $\beta$ -estimate:2.42(95%CI 1.76-3.08),  $F_{(3,105)}=24.85$ ;  $p<0.001$ ) and mental burden ( $\beta$ -estimate:3.65(95%CI:3.02-4.28),  $F_{(3,105)}=21.28$ ;  $p<0.001$ ) than parents in FIM-group 1,2 and 3. They were also more satisfied with rehabilitation ( $\beta$ -estimate:7.65(95%CI:7.31-8.00),  $F_{(3,106)}=4.03$ ;  $p<0.001$ ) reported less communication-problems ( $\beta$ -estimate:93.70(95%CI:91.67-95.74),  $F_{(3,107)}=454.14$ ;  $p<0.001$ ) and better Quality of Life(QoL) ( $\beta$ -estimate:90.63(95%CI:88.73-92.54),  $F_{(3,107)}=278.66$ ;  $p<0.001$ ).

**Discussion and conclusions:** In about 40% of the families with a child with CP, family impact is relatively low. In these families parents reported lower burden, higher satisfaction with rehabilitation, less communication problems and better QoL.

**Clinical message:** By taking into account the findings of this study and by studying the coping style of parents perceiving low impact, in rehabilitation treatment one may be able to turn the glass from half-empty to half-full.

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## INNOVATION POSTER SESSION

I-1

### **“Cookassist app”. An app to facilitate cooking for cognitively impaired brain tumour and stroke patients**

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**Current status:** The app 1.0 to facilitate brain tumour and stroke patient while cooking, developed by Basalt and Leiden University Medical Center, is available for android telephones. This first version is based on several prototypes tested by patients, caregivers and therapists. The app is currently reviewed by students of the Hague university of applied science, patients, caregivers and therapists to develop a more profound program of requirements for the next version.

**Plan of action:** A pilot study will be held based on the 2.0 version of the app aiming to test the efficacy of the app in both brain tumour and stroke patients.

**Topic:** Brain tumour and stroke patients often experience difficulties while performing instrumental activities of daily life (I-ADL tasks) like cooking, due to its complex character. Cognitive impairments make it difficult to perform a cooking task which contains dual tasks and precise planning. The primary goal of the ‘Cookassist app’ is to support patients with cognitive impairments after brain damage while cooking on their own.

**Relevance:** Independently performing I-ADL tasks like cooking increases a patient’s autonomy, participation and quality of life. The app can support caregivers to let their partner cook in their own environment in a controlled and safe way. Occupational therapists can train patients using the app while performing a cooking task. Within the app it is possible to personalise recipes, determine the number of steps and install safety options (e.g. alarm button). Other patient groups are also interest in the possibilities of the app, due to similar cognitive problems.

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I-2

### **Roessingh in the future or the future in Roessingh**

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**Current status:** Developments Demographics: in 2030, there will be a lot more elderly and the same number of people of working ages. Overijssel is a shrinking region, meaning even less people of working ages. Social: increasing tendency to stay at home when becoming older. More single

households. Increasing life expectancy from 80.7 and 83,7 in 2019 till 83.4 and 86.5 in 2035. Increasing number of elderly with co-morbidity, but also better and better treatment. Increasing realization that physical activity is the best 'drug' for staying healthy. Medical: More patients with cancer will survive with negative long term treatment effects. Problems to face A lot more patients will need Medical Specialistic Rehabilitation (MSR) and less professionals will be available for this. Possibilities to consider Cooperation with geriatricians for clinical rehabilitation. We believe that on the spectrum of rehabilitation, geriatric and medical specialistic rehabilitation form a continuum without clear borders. Financial integration? Rehabilitation at home with extensive networks (community rehabilitation). Extensive use of E-health applications. Better organization. Further development of other fields of specialistic rehabilitation. Becoming more attractive for professionals.

**Plan of action:** We started with a project into far-reaching cooperation between geriatricians and physiatrists for clinical rehabilitation. Extensive discussions with our medical staff and other professionals about possibilities. After this, we will rank projects and start with the development. During the presentations, the different developments and possibilities will be discussed.

**Topic:** Roessingh deals with demographic, social and medical developments.

**Relevance:** The current organization of rehabilitation is not up to the future.

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### I-3

#### **Interdisciplinary treatment modalities in patients with chronic musculoskeletal pain: rationale and protocol**

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**Current status:** Patients with CMP participate in a 10-week treatment program and are guided by an interdisciplinary team consisting of physiatrists, physiotherapists, psychologists and trajectory coordinators. Patients are screened for eligibility and assigned to a Basic or a Vital trajectory with a shift to either more mental or physical modalities. Group sessions focus on education in pain recovery, and individual sessions focus on establishing a treatment plan and acquiring skills.

**Plan of action:** Observational data, i.e. diagnostic, evaluative and prognostic questionnaires and performance tests, will be routinely gathered in an electronic database at five CIR-locations in the Netherlands. Measurements are taken at week 0 (pre-intervention baseline), week 5, week 10 with follow-up at 3, 6 and 12 months. Future research will focus on effect sizes of the treatment, possible influencers thereof and differentiating the heterogeneous patient population.

**Topic:** Pain rehabilitation treatment for chronic musculoskeletal pain (CMP) employs biopsychosocial-based strategies. Such strategies focus on dealing with pain and related disabilities, optimizing cognitive and emotional functioning, and resuming daily functioning. A dynamic interplay of mental and physical health professionals is crucial and may be established effectively with an interdisciplinary approach.

**Relevance:** Investigating interdisciplinary treatment modalities is desired to address the biological, psychological and social factors simultaneously within the biopsychosocial framework. This intervention protocol aims at providing a detailed description of the interdisciplinary treatment programs offered by the Centre for Integral Rehabilitation (CIR), the Netherlands. This results in improved knowledge and understanding of pain rehabilitation treatment and supports future research on intervention effects.

#### I-4

##### **Using the wheelchair ergometer in daily practice**

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**Current status:** Rehabilitation centre Basalt and the The Hague University of Applied Sciences (THUAS) acquired a new type of wheelchair ergometer. In a pilot study, medical professionals, therapists and scientist will cooperate to optimize wheelchair seating advice based on expertise and scientific knowledge, resulting in a standardised measurement protocol and seating advice pointers.

**Plan of action:** The pilot study has commenced and a first draft of the protocol is foreseen for September 2019. This protocol will be applied in practice to a limited number of wheelchair users, with the effect of seating advice evaluated by measuring 1) seating position, reach, propulsion in daily wheelchair use and 2) the occurrence of physical complaints like ulcers, excessive fatigue, overuse injuries and pain.

**Topic:** The aim of this project, initiated by Basalt and THUAS, is to develop an objective standardised measurement protocol to support and evaluate wheelchair fitting with a new type of wheelchair ergometer, usable in the clinical routine, in order to let the user function without physical complaints. The outcomes provided and the level of detail regarding exerted force and propulsion technique utilised could be very beneficial for guidance in wheelchair fitting for daily wheelchair users.

**Relevance:** Members of Seating Advice Teams (ZATs) often observe manual wheelchair users with severe physical complaints, that could have been avoided by a better fitted wheelchair. A good fit is a prerequisite to optimize the interaction between human and technology. The use of the ergometer allows for seating evaluation in static situations and during propulsion, the most physical demanding phase of wheelchair use.

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#### I-5

##### **A toolbox for successful transition from the hospital towards home**

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**Current status:** The concept of a TCU is relatively new in the Netherlands. Building is intended to start in 2020. We started to investigate parental and professional needs for a sustainable H2H.

**Plan of action:** Our project consists of two parts. First, we will perform a literature review to evaluate existing transitional care programs and their efficacy on H2H. Secondly, a qualitative field study will inform us on parental and professional needs. Combined results will help us form a toolbox of possible interventions to fine-tune and improve H2H.

**Topic:** We aim to improve transition from the hospital to the home setting (H2H) for children with medical complexity (CMC) and their families. By developing a stand-alone Transitional Care Unit

(TCU), we provide an intermediate step in the process of H2H in which parents can acquire skills and become more empowered for the final step home.

**Relevance:** CMC require round the clock healthcare, which interferes extensively with their lives and that of their families. Both personal and external factors affect the context in which they operate as a family at home and how they cope with stressful moments. To help parents become confident primary caregivers, we need to map parental and professional needs as well as obstacles. By implementing stepped care in a TCU we will be able to support these families through different stages of H2H, therefore facilitate a more sustainable 'landing' home and offer a solid base for child and family functioning and further rehabilitation treatment.

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## I-6

### **Development of a novel care path with a focus on sleep, nutrition and physical activity in children with cerebral palsy**

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**Current status:** 1. Development of a screening tool: A literature search was performed on existing screening instruments. Additionally, parents of children with CP were interviewed to get insight into the problems they experience within these topics. During a consensus meeting, researchers, rehabilitation physicians, and parents selected 27 acceptable and relevant questions that were combined into a screening tool that covers all three domains.

2. In collaboration with experts and parents, we developed a website with information and practical tips related to sleep, nutrition and physical activity.

**Plan of action:** 1. The care path is currently being pilot-tested in three health care settings in Utrecht, will be evaluated and further optimised, and implemented nationally in 2020.

2. A network of dieticians and 'sleep-teams' are being set up for referrals.

3. Information on the website will be updated according to the needs of parents as well as newly acquired insights on the topics of interest.

**Topic:** A novel care path for children with cerebral palsy (CP) that focusses on screening and identification of children with problems with sleep, nutrition and/or physical activity.

**Relevance:** Children with CP experience difficulties with sleep, nutrition and/or physical activity. Currently, there is no standard place for this health triad within paediatric rehabilitation. Therefore, we have developed a novel care path with screening, identification and care for children with CP, aged 0-8 years. This care path will allow rehabilitation physicians and neonatologists to regularly monitor these children on the three domains and provides a system of stepped care.

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## I-7

### **Take a Stroll or in Dutch 'een blokje om' a virtual reality game for users of electric wheelchairs and mobility scooters to practice traffic safety**

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**Current status:** The game developed by Jagaco is currently used at the children's rehabilitation department (Basalt, The Hague). A suitable observation form is being developed to determine a minimum score before the training outside in real traffic situations can start.

**Plan of action:** Evaluation of the determined minimum score before going outside. Improvements in the game will be made to meet more realistic traffic situations. Also the possibility to expand the VR-game with a bike version is examined.

**Topic:** Children and adolescents depending on an electric wheelchair or mobility scooter due to a chronic disease often set 'attending traffic independently' as rehabilitation goal. Due to disabilities in motor skills, perception, behaviour and cognition this is not always easy to achieve due to lack of experience in (unexpected situations of) traffic. The primary goal of 'Blokje om', based on serious gaming, is to practice traffic situations in virtual reality (VR).

**Relevance:** 'Blokje om' increases awareness in traffic situations for children in an electric wheelchair or mobility scooter. The game can support occupational therapists in training traffic safety with children in a safe semi-controlled environment. Difficulty levels of the game can slowly be increased and gives the therapist more insight in the behaviour of the child while attending traffic (e.g. looking, timing etc.) Increase of mobility gives children an increase of autonomy, participation and quality of life. Also caretakers have a major interest in traffic safety for their child; the certainty of functioning independently while attending traffic gives them a safe feeling.

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I-8

### **House of the Future adequate advice for patients on possibilities of products based on domotics, sensor technology and robotics**

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**Current status:** The 'House of the Future' was equipped with interconnected consumer products (e.g. smart lights, thermostat, etc.). A number of scenarios (pre-set configuration of a number of the smart products) were programmed and made accessible in various ways: by voice commands, smart buttons, a tablet/smartphone or a movement sensor. Co-creation sessions with patients and healthcare professionals resulted in priorities in needs and conditions. A training for therapists was developed, a first group of occupational therapists was trained.

**Plan of action:** The training will be extended to other disciplines. The concept will be implemented stepwise for different diagnostic groups. A patient or family can live in the apartment for a set period. A community of practice and action-research will recycle the concept permanently

**Topic:** Basalt hosts a new concept in assessing/training/facilitating independent living at home: smart living. The Basalt 'House of the Future' is a living lab, in which multiple stakeholders are involved in realising these goals. It contains state of the art possibilities, to be used according to patient's needs. Smart connections control smart home automation (domotics, sensor technology and robotics) on behalf of safe, comfortable and independent living for (ex)-patients with a rehabilitation diagnosis.

**Relevance:** Home automation can support patients with impairments in independent living at home and empower them to manage their daily tasks (e.g., remember appointments, doing exercises or taking medication). Personalised smart living should advance return home after clinical rehab and extend the duration of safe, comfortable and independent living at home. Smart living should decrease the burden of informal caregivers.

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## **A custom made silicon footliner for traumatic partial foot amputees with shoe fitting problems despite orthopedic shoes**

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**Current status:** The Certified Prosthetist Orthotist has made some different footliners (March-April 2019) for our patient with different variations of silicon thickness. Our patient is enthusiastic about the first results: his foot feels like it is better supported and more stable and he experiences a smoother skin.

**Plan of action:** We want to inform colleagues that this idea can maybe help more patients with similar problems to regain walking mobility despite their foot-skin-problems. We hope that we convince health insurance companies that this new product can improve quality of life and reduce other medical costs because of morbidity because of immobility or other medical operations.

**Topic:** Custom made silicon liners will sometimes be made for patients with a transtibial amputation. We decided to make a silicon footliner for a 32-old man with a traumatic partial foot amputation, fractures and deglovement in 2017. He struggles with delicate skin after skin transplantations and frequent skin lesions despite low level of activity and orthopedic custom-made shoes. If the skin problems can't be resolved a major amputation is being considered. The custom made silicon footliner is a new indication for an existing product with new possibilities for a new group of patients, with advantages like: - Silicon that smoothens the delicate transplanted skin. - Possibilities of (weight bearing) support by variation of silicon thickness. - Support of the foot in all directions: our patient reported that his foot felt more stable.

**Relevance:** Rehabilitation physicians who work with patients with traumatic partial foot amputees, with shoe fitting problems because of delicate skin.

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