DCRM
Dutch Congress of Rehabilitation Medicine

NSRM
NETHERLANDS SOCIETY OF REHABILITATION MEDICINE

ABSTRACT BOOK

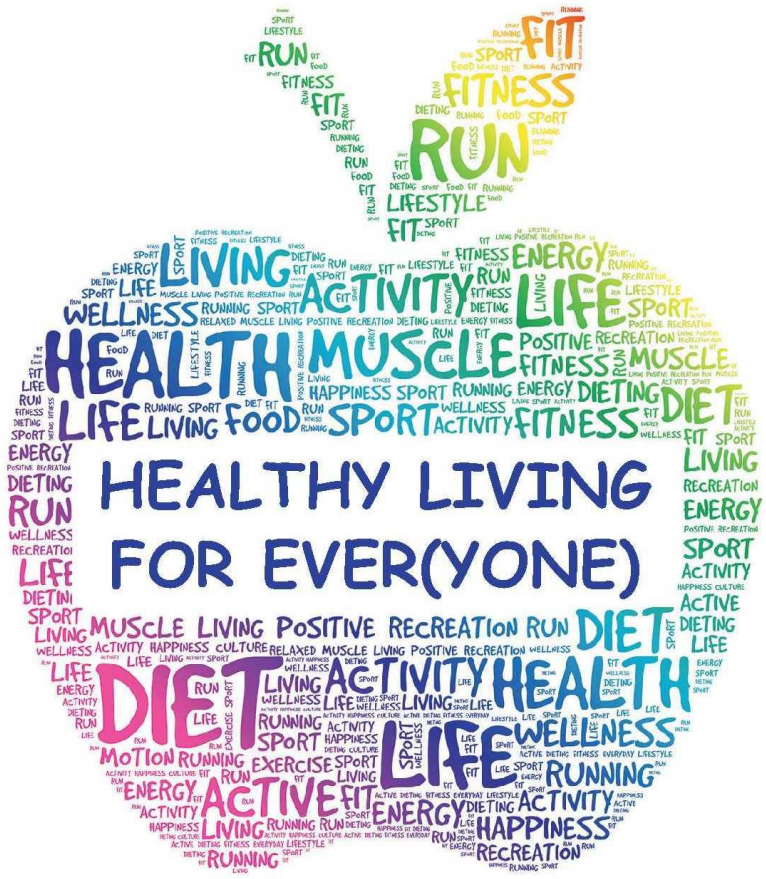

Table of content

Programme Overview

THURSDAY 8 NOVEMBER

08.30 – 10.00 **Registration of the participants**

10.00 – 10.05 **Opening**

10.05 – 10.30 **KEYNOTE LECTURE: Ronnie Gardiner**
The Ronnie Gardiner Method

10.30 – 11.00 **KEYNOTE LECTURE: Prof. Andrea Maier MD PhD**
Micro-rehabilitation to maximize healthspan

11.00 – 11.30 **KEYNOTE LECTURE: Rienk Dekker MD PhD**
Physical Activity in Rehabilitation: the ultimate medicine?

11.30 – 11.40 **Pitch presentations of the 10 Best Posters (plenary)**

11.40 – 12.55 **Poster walk and exhibition: Networking Lunch Break**

12.55 – 15.30 **Parallel Session A: Workshops**

- **A1.** S.M.A.S.H. (= Smoking prohibited, Move more, Alcohol in moderation, Sleep well, and Healthy nutrition): smashing ideas for a healthy life style
- **A2.** Advanced exercise testing and training in rehabilitation

12.55 – 13.55 **Parallel Session A: Free paper sessions**

- **A3.** Free paper session
- **A4.** Free paper session
- **A5.** Free paper session
- **A6.** Free paper session
- **A7.** Free paper session
- **A8.** Free paper session

14.00 – 15.30 **Parallel Session B: Workshops and mini-symposia**

- **B3.** The start of the national cerebral palsy registry in The Netherlands
- **B4.** Home-based training in children with unilateral cerebral palsy: chances and challenges
- **B5.** Individualized training for residents in rehabilitation medicine: A new approach by Klimmendaal-Radboudumc-Rijnstate-Sint Maartenskliniek-Tolbrug (OOR-ON)
- **B6.** eRehabilitation: development, evaluation and implementation of eHealth in rehabilitation
- **B7.** Neuropathic pain among people with spinal cord injury: innovations in assessment and treatment
- **B8.** The Ronnie Gardiner Method, sets the brain in motion!

15.30 – 16.15 **Poster walk and exhibition: networking break**
16.15 – 17.45 **General Assembly NSRM**
17.45 – 18.30 **Aios borrel**
17.45 – 19.30 **Free time**
19.30 – 00.00 **Dinner Party**

FRIDAY 9 NOVEMBER

07.30 – 08.30 **Registration of the participants**

07.30 – 08.00 **Bootcamp** ***(starts at main entrance Martiniplaza)***

08.30 – 10.00

Parallel Session C: Workshops and mini-symposia

- **C1.** New priorities in paediatric research
- **C2.** To participate or not to participate: that is the challenge why and how to promote meaningful participation of children and young adults with disabilities?
- **C3.** Behavior change towards a healthy lifestyle: needs more than just an advice
- **C4.** Innovative interventions to support informal caregivers
- **C5.** Working towards healthy living in patients with chronic pain: A stepped care approach
- **C6.** The role of rehabilitation in the changing world of SMA
- **C7.** Gait analysis and adaptations; using new ideas to tackle old problems in gait classification and training
- **C8.** Handcycling: the way to go from a physiological and biomechanical perspective

10.00 – 10.45 **Coffee break and visiting commercial exhibition**

10.45 – 11.45

Parallel Session D: Debate and PhD thesis session

- **D1.** PhD thesis session: Presentations of the best PhD theses in the Netherlands
- **D2.** Debate: 'Healthy living for everyone!! Really?

11.50 – 12.20 **KEYNOTE LECTURE: Prof. Mark Nash MD PhD**

Cardiometabolic Disease Management Following Spinal Cord Injury: Exercise and Nutritional Imperatives

12.20 – 13.20 **Poster walk and exhibition: Networking Lunch Break**

13.20 – 14.50

Parallel Session E: Workshops and mini-symposia

- **E1.** Strength and fatigue of the upper limb in children with Unilateral Spastic Cerebral Palsy. New insights in measurement and training
- **E2.** Sexual Health Care in physical rehabilitation medicine: pitfalls and challenges
- **E3.** Value Based Health Care in Rehabilitation: From Hype to Reality
- **E4.** Measuring cognitive functioning in rehabilitation: brief screening and outcome measurement
- **E5.** The application of sensors to objectively monitor orthopaedic footwear adherence in research and clinical practice
- **E6.** Rehabilitation, Sport & Active Lifestyle: now and in the future
- **E7.** Patient Participation in Research: Challenges and Opportunities
- **E8.** PROFITS: opportunities to improve prediction and services early post stroke.

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: Prof. Mai Chin A Paw PhD** *Confusion, Contradiction and Consternation – Promoting physical activity or reducing sedentary behaviour for child health?*
16.10 – 16.40	**KEYNOTE LECTURE: Olaf Verschuren PHD** *Exercise, Nutrition, and Sleep are Critical to Success*
16.45	**End of the congress**

Keynote Lectures

Thursday 8 November

Friday 9 November

Ronnie Gardiner

Thursday 8 November, 10.05 – 10.30

The Ronnie Gardiner Method

Chair: prof. Coen van Bennekom MD PhD

Summary

RGM is a novel rhythm- and music-based rehabilitation method that has been used within Swedish healthcare and rehabilitation since 1993, with international dissemination since 2009. The Ronnie Gardiner Method (RGM) is a structured, multimodal and multi-sensory exercise method which combines movement and cognitive challenge in a playful way in order to improve cognitive functions like concentration, coordination, and memory. It also enhances postural control, energy, motivation and lifts the mood. The RGM is built on the scientific principles of motor control, motor learning, postural control, and neuroplasticity, including new ideas of enriched environment. The method is used to address many conditions such as Parkinson's disease, MS, stroke, acquired brain injury, children with reading and learning difficulties and also as an activity to enhance healthy aging. For 20 minutes Ronnie Gardiner (aged 86) will give you a taste of his method, shows you what a drummers mind can mean for rehabilitation. Delegates with interest in more background information, possible applications and effects for the various target groups are most welcome to participate in the RGM-workshop, also scheduled for Thursday.

Biography

Ronnie Gardiner is a professional jazz drummer who lives in Stockholm, Sweden. He has played worldwide with musicians like Dizzy Gillespie, Gerry Mulligan and Dexter Gordon and has more than 85 recordings to his name. Even now, at the age of 86, he still performs with the best Swedish jazz musicians. In the late 1990's he decided to use his talents as professional drummer for healthcare and in a period of 10 years he created what is now called the Ronnie Gardiner Method (RGM). Since 2000 the method is being used for different target groups both in healthcare as in education. Ronnie has been further improving RGM ever since and still teaches RGM in a growing number of countries. In 2001, he was the first American to be honored with the Swedish Saint Erik's medal, and in May 2015 he received the Swedish Mensa award for the development of his method and contribution to healthcare. Ronnie Gardiner has been training therapists since 2000 and has presented countless workshops around the world.

Prof. Andrea Maier MD PhD

Thursday 8 November, 10.30 – 11.00

Micro-rehabilitation to maximize healthspan

Chair: prof. Coen van Bennekom MD PhD

Summary

Biological processes that contribute to aging and accompanied deteriorating health are being increasingly understood and have been summarized as nine overarching hallmarks of ageing (genomics instability, telomere attrition, epigenetic changes, loss of proteostasis, deregulated nutrient sensing, mitochondrial dysfunction, cellular senescence, altered intercellular communication, stem cell exhaustion). The aging process occurs gradually, is highly individual, with a high degree of inter and intra-individual differences, which are predominantly based on genetic and environmental factors. As such, within an aging population there is significant variation in regards to the extent of age related disease and functional impairment, which can be captured by the term 'biological age'. Biogerontological interventions aim to target the biological age i.e. an individual's pathophysiological processes, to prevent age related diseases and promote the healthspan.

Biography

Prof. Andrea Maier (1978) graduated in Medicine at the Medical University Lübeck (Germany) in 2003 and registered as a specialist Internal Medicine-Geriatrician at the Leiden University Medical Centre (The Netherlands) in 2009. Her research is driven by her passion to unravel ageing mechanisms and the interaction of ageing and age-related diseases, with a particular focus on sarcopenia. In 2013, she was appointed as full Professor of Gerontology at the VU University, Amsterdam Movement Science (The Netherlands). Since February 2016 she is Divisional Director of Medicine and Community Care at the Royal Melbourne Hospital and Professor of Medicine and Aged Care at the University of Melbourne (Australia). During the last 8 years she conducted several national and European observational studies as well as clinical trials and published more than 180 peer reviewed articles in international journals. Her innovative, multidisciplinary @Age research team works in the Netherlands (@AgeAmsterdam) and in Australia (@AgeMelbourne). She is an invited member of several international research and health policy committees to eventually increase the visibility, quality and quantity of ageing research.

Rienk Dekker MD PhD

Thursday 8 November, 11.00 – 11.30

Physical Activity in Rehabilitation: the ultimate medicine?

Chair: prof. Coen van Bennekom MD PhD

Summary

"Sitting is the new smoking"
"Physical inactivity is the 4th leading risk factor for death, worldwide"
"The lack of exercise is a serious public health concern for all people"

These quotes are familiar to most of us: a healthy life style is important for instance in the prevention of (cardio)vascular diseases and is considered by some as a crucial element of health(care). Nearly every journal or magazine, whether it is of a scientific or of a layman's background, publishes information on this topic. If we consider physical activity to be an important, scientifically proven, cheap and easy accessible medicine, then it is surprising and very disappointing that this therapy is not broadly applied in our medical practice. In the presentation, reasons for this default will be explained. The focus of the lecture will be on the opportunities to apply the principles of an active lifestyle in the rehabilitation treatment. Even when resources are limited, easy accessible ways to implement physical activity in every phase of the rehabilitation of our patients are within reach and will be discussed. Implementation is possible, for instance, by applying testing and training protocols, as well as by using scientifically substantiated methods to motivate and encourage patients to become and, even more importantly, stay physically active after having ended the rehabilitation treatment. Through illustrating the background and the considerations concerning the application of physical activity, the presentation aims to motivate and encourage the use of this treatment option in rehabilitation.

Biography

Rienk Dekker is a consultant in rehabilitation medicine and an associate professor in the Department of Rehabilitation Medicine of the University Medical Center Groningen, the Netherlands. In the field of scientific research, education and patient care he focuses on physical activity, sports and rehabilitation. In the context of research he delivered his PhD in 2004, has published over 65 peer-reviewed international (co-)authored articles on this subject and is involved in a number of related PhD-projects. He succeeded in acquiring relevant grants to facilitate research in this field. As a principal investigator and rehabilitation physician he aims to implement the principles of an active life style in preferably all rehabilitation treatments as a means to enhance the outcome of the rehabilitation process. For that purpose, in close collaboration with a number of (research) partners, he is committed to develop several initiatives. Starting up a network of rehabilitation physicians working in the field of exercise, developing protocols for enhancing physical fitness, defining performance indicators, delivering presentations on the topic and setting up specific training options for personnel are some examples of these initiatives.

Prof. Mark Nash MD PhD

Friday 9 November, 11.50 – 12.20

Cardiometabolic Disease Management Following Spinal Cord Injury: Exercise and Nutritional Imperatives

Chair: Agali Mert MD PhD

Summary

People sustaining spinal cord injuries (SCI) frequently experience component and coalesced health risks of the cardiometabolic syndrome (CMS). The CMS hazards of overweight/obesity, insulin resistance, hypertension, and dyslipidemia - the latter as depressed high-density lipoprotein cholesterol and elevated triglycerides - are strongly associated with physical deconditioning, which is common after SCI and worsens the prognosis for all-cause cardiovascular disease occurring early after injury. Evidence supports a role for physical activity after SCI as an effective countermeasure to these risks, and often represents the first-line approach to CMS abatement. This evidence is supported by authoritative guidelines that recommend specific activities, frequencies, and activities of work. In many cases, the most effective exercise programming uses a combination of resistance and endurance maneuvers with limited rest taken between sets. As SCI is also associated with food intake that is excessive in calories and saturated fat, more comprehensive lifestyle intervention incorporating both exercise and nutritional modification represents a favored approach for overall health management. Irrespective of the interventional strategy, improved surveillance of the population for CMS risks and encouraged incorporation of moderate exercise and nutritional intake by health care professionals may play an important role in preservation of activity, optimal health, and preserved independence throughout the lifespan. The presentation will focus on best practice solutions for exercise deconditioning and imprudent nutrition after SCI, and evidence that their management is associated with improvement in cardiometabolic component risks for the most threatening of post-injury health hazards.

Biography

Mark S. Nash, Ph.D., FACSM is a tenured Professor of Neurological Surgery and Physical Medicine & Rehabilitation at the University of Miami Miller School of Medicine, and Director of the Applied Physiology Research Laboratory for the Miami Project to Cure Paralysis. Professor Nash is Director of Research in the Department of Physical Medicine & Rehabilitation and Co-Director of the NIDILRR Spinal Cord Injury Model System. He is a Fellow of the American College of Sports Medicine, has published more than 130 peer-review manuscripts, scholarly monographs and books, and is a Director for the American Spinal Injury Association. Professor Nash has received multiple grant awards from the U.S. Departments of Defense, Health & Human Services, and Education, and the Nielsen Foundation. He's been a grant reviewer for these federal agencies as well as the NIH and CDC, sits on Research Advisory Boards of 5 research/medical foundations, and advises federal/foundation research agencies in four overseas countries. His works have examined causes for, and interventions on cardiometabolic risks and diseases after SCI. In 2012 he was honored by ASIA with the David Apple MD Award, and in 2018 her received the John Stanley Coulter Award from the ACRM for lifetime achievement in rehabilitation.

Prof. Mai Chin A Paw PhD

Friday 9 November, 15.40 – 16.10

Confusion, Contradiction and Consternation – Promoting physical activity or reducing sedentary behaviour for child health?

Chair: Annemieke Buizer MD PhD

Summary

Despite the widely acknowledged health effects of regular physical activity, many children do not follow physical activity recommendations. Over the past 10 years the attention for the potential adverse health effects of sedentary behaviour has steeply increased. Although the body of evidence that excessive sedentary time contributes to ill health among adults is expanding, the evidence in children is still contradictory. Further, relationships between measures of sedentary behaviour (e.g., through self-report vs accelerometer or inclinometry) and health indicators vary considerably. Effectiveness of interventions aimed at promoting physical activity and reducing sedentary behaviour is disappointing. In this presentation, I will critically discuss the current evidence on the health effects of child sedentary behaviour as well as new insights into how to develop more effective, attractive and sustainable interventions.

Biography

Mai is fascinated by why we do what we do and how this affects health, with particular interest in youth. She combines her scientific expertise in human movement science and epidemiology to unravel working mechanisms using innovative methodologies, exploring unique intervention strategies and creatively combining multiple disciplines. Her research focuses on determinants and health consequences of physical activity and sedentary behaviour in youth, with a strong interest in measurement, underlying mechanisms and innovations in risk factor research. She was awarded University Research Chair professor at VU University Medical Center in Amsterdam. Also, she has been chosen as one of the two directors of the program Health Behaviours and Chronic Diseases of the Amsterdam Public Health Research Institute, an alliance between AMC/UvA and VU/Vumc

Olaf Verschuren PhD

Friday 9 November, 16.10 – 16.40

Exercise, Nutrition, and Sleep are Critical to Success

Chair: Annemieke Buizer MD PhD

Summary

Good health and fitness across the lifespan are critical to all people, but may be challenging for people with physical disabilities. "Exercise Is Medicine' is a global initiative to mobilize physicians and healthcare professionals to promote exercise in their practice or prescribe activities to prevent, reduce, manage, or treat diseases that impact health. This initiative has resulted in an increasing interest in exercise and physical activity programs for people with disabilities. In rehabilitation, physical activity promotion has been the main focus to optimize fitness and health in both clinical practice and research. However, for professional athletes physical activity and exercise training are just part of their formula for success. Elite athletes know the importance of nutrition and sleep as key contributors of sport success. Physical activity, sleep, and nutrition are considered the three main components that allow an individual's body to achieve its goals related to physically demanding activities in daily life and optimal health. Given the heterogeneity of the disabilities that are common in rehabilitation, physical activity alone may not be enough for individuals to improve health, specifically those more severely affected. So, at present, opportunities to promote health and to prevent disease might be missed. In this presentation, I hope to motivate physicians and other health care practitioners to include, in addition to physical activity promotion, nutrition and sleep management in patient encounters. Managing these three components, preferably in a comprehensive fashion, will afford a vitally important opportunity to promote the health of people across the lifespan.

Biography

Olaf Verschuren is a senior researcher working at the Brain Center Rudolf Magnus and Center of Excellence for Rehabilitation Medicine, University Medical Center Utrecht and De Hoogstraat Rehabilitation, Utrecht, The Netherlands. His research focuses on (pediatric) rehabilitation, specifically on the physical function and physical health of children and adolescents with Cerebral Palsy (CP). Most of his research is related to fitness measures for aerobic and anaerobic capacity, exercise fitness programs, and physical health for children and adolescents with CP. He has experience implementing fitness measures and exercise programs in various rehabilitation centers/schools for special education across Europe, Canada and Australia. The overall goal of his innovative research is to improve the physical health of people with CP. Therefore, the last three years he has broadened his research areas; besides physical activity, he also focuses on sleep and nutrition.

Parallel Session A – Free Paper Sessions

Thursday, 12.55 – 13.55

Free paper session A3

Chair: prof. Jeanine Verbunt MD PhD

1. The Rijnlands Rehabilitation Center: Value-based Rehabilitation in Practice

I.F. Groeneveld[1], M. de Jonge-Algra[1], F.M. van Vree[1], P.H. Goossens[2], T.P.M. Vliet Vlieland[2]

[1]Rijnlands Rehabilitation Center, LEIDEN, The Netherlands
[2]Leiden University Medical Center/ Rijnlands Rehabilitation Centre/ Sophia Rehabi, LEIDEN, The Netherlands

Introduction: The Rijnlands Rehabilitation Center offers value-based rehabilitation. We strive to continuously improve our treatment and therefore routinely measure quality of life pre- and post rehabilitation, by means of the Euroqol-5D (EQ-5D). **Objective:** To describe 1) the feasibility of routinely collecting EQ-5D data; 2) the changes in quality of life. **Patients:** Patients with stroke, pain, and cardiovascular disease (CVD). **Methods:** Stroke inpatients and outpatients received the EQ-5D at baseline and three months thereafter, by email or postal mail, whichever they preferred. Pain and CVD patients received an email comprising a link to the EQ-5D at the start and end of rehabilitation. Response rates (feasibility) and changes in EQ-5D (outcomes) are presented. **Results:** Of the stroke inpatients (n=239), 97.3% completed the baseline questionnaire and 78.7% the questionnaire at three months. For outpatients (n=71) these percentages were 95.2 and 86.6 respectively. In pain and CVD patients the respons was somewhat lower. In all disease groups quality of life improved, i.e. mean differences (95%CI) for stroke inpatients: 0.04 (0.01; 0.07), stroke outpatients: 0.05 (-0.01; 0.10), pain: 0.14 (0.07; 0.21), CVD: 0.03 (0.004; 0.06). The data were graphically presented in concise and patient-friendly 'result cards'. **Discussion and conclusion:** Routine data collection appeared feasible, although not all patients were reached. Significant improvements in quality of life were revealed. **Clinical message:** Routine outcome measurements are valuable as they provide feedback to health professionals within the RRC and clues for improvement of treatment, as well as transparency and information for patients and health professionals outside the RRC.

I.F. Groeneveld- igo@rrc.nl

2. Systematic evaluation of health outcomes in Reade!

R.H.M. Nijland, A. Jonkman, S. de Groot, M. van der Leeden, F. Bos, M. van der Esch, A. de Rooij, L. Roorda

Reade, center voor rehabilitation and reumatology, AMSTERDAM, The Netherlands

Introduction: Assessing patients before and during their rehabilitation process is important for goalsetting and the right choice for treatments. Also to provide a valid prognosis of outcome and to inform patients about their progress.
Information that needs to be collected for patient care can also be used for scientific research. For instance, to improve our knowledge about patient profiles that benefit from rehabilitation treatment, what is important to offer a more customized treatment.
Such synergy between care and research has been reflected in the systematic care evaluations (SCEs) in Reade Rehabilitation and Rheumatology center. **Objectives:** To offer rehabilitation treatments that fit the needs and potential of patients and subsequently build a database that can be used for further scientific research. Data are obtained through structured measurements at fixed times during the rehabilitation process.
Patients: SCEs are implemented in Reade for patients with acquired brain injury, spinal cord injury, chronic pain, knee / hip osteoarthritis, hand surgery and prescribed foot orthoses or therapeutic shoes for rheumatoid arthritis patients. **Methods:** The selection of measuring instruments is based on (inter-)national guidelines. The data are entered into a database and graphically fed back into electronic patients files. The data are used in multidisciplinary consultations and for research

purposes. **Results:** At the moment about 2500 patients are included in SCEs, varying between 230 and 850 patients per diagnostic group. 17 publications came out from these data. **Clinical message:** The SCEs are an example of an excellent synergy between care and research within a rehabilitation institution.

R.H.M. Nijland- r.nijland@reade.nl

3. Using the 'behandelmodules' registration data to get insight in rehabilitation treatments and relate treatments to functional outcomes: a single-center analysis

M.W.M. Post, F. Buiter, R. Beuker

De Hoogstraat Rehabilitation, UTRECHT, The Netherlands

Introduction: In 2014, the national "Care modules project" ("Behandelmodules") was initiated to link rehabilitation treatments to costs. We were interested in the possibility to use data from this registration for quality improvement purposes. **Objectives:** (1) To describe treatments provided to patients admitted to De Hoogstraat and differences between "invoiced" and "experienced" treatment time.
(2) To explore differences in treatments according to diagnosis, age, team, or other characteristics. (3) To associate treatments with improvement in physical independence during admission. **Patients:** Patients were selected who were admitted/discharged to/from De Hoogstraat, for first inpatient rehabilitation, between 01-07-2016 and 24-04-2018, aged 18 or above, and with complete data on the Utrecht Scale for Evaluation of Rehabilitation (USER). **Methods:**Treatment data, patient characteristics and USER-scores were retrieved from the hospital database. **Results:** A total of 573 patients were selected. Most had brain injury (n=312) or spinal cord injury (n=134). Mean age was 55.1 years (SD 16.2), mean number of admission days was 55 (SD 39.3) and mean functional improvement was 17.4 points (SD 14.6). Invoiced treatment time was 66.9% of the experienced treatment time. Large differences between diagnostic groups were seen. Treatment time was significantly associated with functional improvement. Limitations of the available data include the frequent use of the code "treatment not described in modules" (18%) and the huge impact of the breakfast therapy group for all patients with brain injury on the results. **Conclusion:** This study revealed possibilities and limitations of the use of the care modules registration.

M.W.M. Post- m.post@dehoogstraat.nl

4. The Respiratory Care Unit in a rehabilitation center: the effects on inpatient length of stay in hospital and rehabilitation center.

K.A. van den Oever, D. Gobets, J.M. van Velzen

Heliomare, WIJK AAN ZEE, The Netherlands

Introduction: A Respiratory Care Unit (RCU), offering patients 24-hour care on a Medium Care Unit level including mechanical ventilation and diagnose-specific rehabilitation, is a new concept in a rehabilitation center (RC). Shorter length of stay (LoS) from admission to hospital until discharge from RC is expected if patients needing complex care are transferred early from an Intensive Care Unit to a RCU. **Objective:** To evaluate LoS in hospital and RC of RCU and non-RCU patients. **Patients:** Fifty-four RCU and 8 non-RCU (selected based on their potential inclusion on RCU by clinical presentation at enrollment during six months before opening of the RCU) patients of a Dutch RC. **Methods:** Data were distracted from existing RC registration systems and descriptively analyzed. Primary outcome: total LoS (time from hospital admission until discharge from RC). Secondary outcomes: hospital LoS and RC LoS. **Results:** No statistical significant differences were found in median (min-max) total LoS (RCU: 200 (59-467) days; non-RCU: 211 (79-508)days; p=0.38), hospital LoS (RCU: 48 (5-214) days; non-RCU: 75 (13-148) days; p=0.37) or RC LoS (RCU: 127 (22-381) days; non-RCU: 166 (22-392) days; p=0.18). **Discussion/conclusions:** Shorter LoS is seen in the RCU patients compared with the non-RCU patients. However, differences were not statistical significant, probably due to the small non-RCU group (underpowerment).

Clinical message: Although total LoS did not change, patients needing complex care and rehabilitation are transferred >25 days earlier (median) from an Intensive Care Unit to a RC since the opening of the RCU so diagnose-specific rehabilitation can start earlier.

K.A. van den Oever- karenvandenoever@icloud.com

Free paper session A4

Chair: Agali Mert MD PhD

5. Feasibility of a Digital Neuropsychological Assessment in patients with acquired brain injury

I.K. Gosselt, L.A. Spreij, J.M.A. Visser-Meily, T.C.W. Nijboer

Center of Excellence for Rehabilitation Medicine, University Medical Center, UTRECHT, The Netherlands

Introduction: A Digital neuropsychological assessment (D-NPA) has important benefits compared to currently used paper-and-pencil tests, like more standardized administration, automatized scoring, and particularly novel outcome measures that go beyond paper-and-pencil tests (e.g. strategy, fluctuations in performance). **Objective:** To examine the feasibility of a D-NPA in patients with acquired brain injury and healthy controls. **Patients:** Outpatients from the University Medical Center Utrecht and the Hoogstraat Rehabilitation Center, Utrecht, The Netherlands. **Methods:** Eleven neuropsychological tests were administered using a tablet computer and a laptop. A semi-structured interview was conducted concerning the usability (each question ranged between 1-5). **Results:** 59 stroke patients, 61 TBI patients and 56 healthy controls were included. All participants completed all tests, except for 12% of TBI patients. Brightness of the tablet computer was adjusted for 8% of TBI patients and sound volume for 2% of both patient groups. No stroke patients and healthy controls needed an extra break, unlike 10% of TBI patients. Regarding usability, participants overall enjoyed working with a D-NPA (M=4.3, SD=0.7). In general, participants thought the visibility was very good (M=4.6, SD=0.6), and that drawing on the tablet computer was easy (M=3.8, SD=0.9) and quite comparable to drawing with paper-and-pencil (M=3.1, SD=1.2). **Discussion and conclusions:** A D-NPA can be considered as feasible. Traditional neuropsychological tests can be administered with a D-NPA and therefore commonly known cognitive domains can be assessed. **Clinical message:** Using a D-NPA is enjoyable for patients. Overstimulation should be taken into account for individual use due to different cognitive complaints among patients.

I.K. Gosselt- i.k.gosselt@umcutrecht.nl

6. Early shortening of wrist flexor muscles coincides with poor recovery after stroke

J.H. de Groot[1], K.L. de Gooijer-van de Groep[1], J.M. van der Krogt[1], E. de Vlugt[2], J.H. Arendzen[1], C.G.M. Meskers[3]

[1]Leiden University Medical Center, LEIDEN, The Netherlands
[2]The Hague University of Applied Sciences, DELFT, The Netherlands
[3]Free University Medical Center (VUMC), AMSTERDAM, The Netherlands

Introduction: The time course of neural reflexive and muscle tissue properties affecting arm-hand function early after stroke are not understood, yet important for timely contraction prevention. **Objective:** To investigate the time course of neural and tissue changes around the wrist joint, quantified non-invasively by reflexive torque, muscle slack length and tissue stiffness throughout 26 weeks post-stroke. **Patients:** 36 (27 male) stroke patients (age: 60, SD 11y), included within the Explicit-Stroke cohort. Patients were initially stratified for prognosis (Poor, Good) based on presence of finger extension and retrospectively for arm- hand functional outcome at 26 weeks (Poor: ARAT < 10 points, Good: ARAT ≥ 10) **Methods:** At the wrist (at rest), rotations were applied and forces measured by a robot manipulator. Neural reflexive and muscular tissue properties were estimated using a mathematical EMG-driven wrist model. Properties were compared between stratified groups at week [1:5,8,12,26] post stroke. **Results:** Compared to patients with good recovery (73%), patients with poor recovery (27%) showed increased reflexive torques and reduced muscle slack length of the wrist flexors and increased passive joint stiffness at 26 weeks. Tissue changes were identified as early as four weeks, neural changes were observed from week 12. **Conclusions:** Observations suggest an early onset of increased peripheral tissue stiffness through shortening of muscles to precede neural reflexive stiffness in patients with poor recovery of arm-hand function. Clinical message: Poor

functional recovery coincides with wrist flexor shortening within four weeks. Longitudinal interventional studies are prompted to evaluate and eventually prevent emerging wrist flexion deformities.

J.H. de Groot- J.H.de_Groot@LUMC.NL

7. Effects of ankle-foot orthoses on tibialis anterior muscle electromyography after stroke: a randomized controlled trial

-

C.D.M. Nikamp- c.nikamp@rrd.nl

8. Physical activity predicts fatigue in daily life after stroke: New insights with the Experience Sampling Method

N. van Kampen[1], B. Lenaert[2], C. van Heugten[3], R. Ponds[4]

[1]Adelante zorggroep, MAASTRICHT, The Netherlands
[2]Brain Injury Center Limburg, MAASTRICHT, The Netherlands
[3]School for Mental Health and Neuroscience, Faculty of Health, Medicine and Life, MAASTRICHT, The Netherlands
[4]Department of Psychiatry and Neuropsychology, Maastricht University, MAASTRICHT, The Netherlands

Introduction: Fatigue ranks among the most common symptoms after stroke, but remains poorly understood. In particular, little is known about the impact of physical activity on fatigue, giving rise to inconsistent rehabilitation strategies. **Objective:** This study aimed to assess the relation between physical activity and fatigue after stroke using novel mHealth methodology: the Experience Sampling Method (ESM). By repeatedly measuring real-time symptom experiences in the flow of daily life, ESM allows capturing diurnal symptom variations and complex person-environment dynamics. **Patients:** Thirty patients who recently suffered a cerebrovascular accident and were receiving outpatient rehabilitation treatment were included. **Methods:** For a period of six consecutive days, participants were prompted 10 times each day to complete a digital questionnaire using a web-application (PsyMate) on their smartphone. The digital questionnaire assessed, among other variables, self-monitored physical well-being (e.g., fatigue, pain) and physical activity. **Results:** Based on 1011 measurement moments across participants, multilevel regression analyses showed that fatigue was predicted by higher levels of preceding physical activity (B=.08, SE=0.02, p<.001). Moreover, this relationship was stronger for physical fatigue (B=.17, SE=.022, p<.001), than for mental fatigue (B=.074, SE=.021, p<.001). **Discussion and conclusions:** Using innovative methodology capturing symptom experience in everyday contexts, we found that physical activity is associated with higher levels of fatigue among stroke patients. Future studies should combine ESM with more objective measurement of physical activity, such as accelerometers. **Clinical message:** By revealing a positive relation between daily physical activity and fatigue after stroke, this study provides new insights that may benefit rehabilitation strategies.

N. van Kampen- vankampennadine@gmail.com

Free paper session A5

Chair: Jetty van Meeteren MD PhD

9. The effect of a passive trunk exoskeleton on metabolic costs during lifting and walking

S.J. Baltrusch[1], J.H. van Dieën[2], S.M. Bruijn[2], A.S. Koopman[2], C.A.M. van Bennekom[1], H. Houdijk[2]

[1]Rehabilitation Center Heliomare, WIJK AAN ZEE, The Netherlands
[2]Vrije Universiteit Amsterdam, AMSTERDAM, The Netherlands

Introduction: Exoskeletons that passively support the user's trunk are currently developed to support people with low back pain during task performance. Next to its biomechanical effect, it could be expected that exoskeletons reduce metabolic load and as such contribute to reduce the risk for low back injury. However, it may concurrently hamper performance by increasing energy cost of other tasks such as walking. **Objective:** To assess how a passive trunk exoskeleton affects the metabolic costs, movement strategy and muscle activation during repetitive lifting and walking. **Patients and Methods:** We measured energy expenditure in 11 healthy men during 5 min of repetitive lifting and 5 min of walking. Participants had to lift and lower a 10 kg box from two heights and had to walk at two different speeds with and without the exoskeleton. For both tasks, kinematics and muscle activity of back and abdominal muscles were collected. **Results and Discussion:** When wearing the exoskeleton during lifting, metabolic costs decreased as much as 17%. In conjunction, participants tended to move through a smaller range of motion, reducing mechanical work generation. When walking with the exoskeleton, metabolic costs increased up to 17%. Participants walked somewhat slower with shortened steps, while abdominal muscle activity slightly increased when wearing the exoskeleton. **Conclusion and Clinical Message:** Wearing an exoskeleton during lifting decreased metabolic costs and hence may reduce the development of fatigue and LBP risk. During walking, metabolic costs increased, stressing the need for a device that allows disengagement of support depending on activities performed.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/8DCRM/add_1_455805_fc28ba74-a928-4b42-b9e4-8bb3d00e911f.jpg
Caption 1: Measurement of oxygen consumption, muscle activity and kinematics during repetitive lifting

S.J. Baltrusch- s.baltrusch@heliomare.nl

10. Pain, fatigue and depression in young adults with cerebral palsy

N. Warnier[1], M. van Gorp[2], L. van Wely[3], W.M.A. van de Slot[4], M.E. Roebroeck[5]

[1]Rijndam Rehabilitation / EMC, ROTTERDAM, The Netherlands
[2]EMC/VUMC, ROTTERDAM/AMSTERDAM, The Netherlands
[3]VUMC/EMC, AMSTERDAM/ROTTERDAM, The Netherlands
[4]Rijndam Rehabilitation Centre / EMC, ROTTERDAM, The Netherlands
[5]Rijndam Rehabilitation/EMC, ROTTERDAM, The Netherlands

Introduction: Patients with Cerebral Palsy (CP) in adulthood report health complaints such as pain, fatigue and depressive symptoms. The occurrence of these complaints and association with health in young adulthood is unknown.
Objective: We aim to investigate the occurrence of pain, fatigue and depressive symptoms in young adults with CP, determinants of these complaints and associations with general health. **Patients:** 97 young adults with CP without intellectual disability (age: 21-34 years, 81% GMFCS level I-II).

Methods: Pain intensity (SF-36), fatigue (CIS- fatigue), depressive symptoms (PROMIS) and General health (PROMIS) were self-reported. Using multiple logistic regression analyses we investigated CP related, personal and social determinants of complaints and associations with general health ($p<0.05$). **Results:** Pain occurred in 69%, fatigue in 23% and depressive symptoms in 14% of the sample. Co-occurrence of three complaints was present in 9% and two complaints in 18%. Age and GMFCS level were determinants of fatigue; age and self-efficacy for depressive symptoms; none is associated with pain. General health was associated with fatigue (OR 8.3 $p=0.002$) and depressive symptoms (OR 5.7 $p=0.045$).
Discussion and conclusion: The majority of young adults with CP had one or more of the complaints pain, fatigue or depressive symptoms. Fatigue and depressive symptoms have a strong association with general health.
Clinical message: Screening for pain, fatigue and depressive symptoms in young adults with CP is important due to their prevalence and influence on a person's general health. Future research should asses possibilities to influence general health by reducing these complaints.

N. Warnier- nadiehwarnier@gmail.com

11. Functional disability in adolescents with chronic pain: comparing a multimodal graded exposure in vivo rehabilitation program to usual Care, a randomized clinical trial

C. Dekker[1], M.E.J.B. Goossens[1], B. Winkens[1], S.C. Remerie[2], C.H.G. Bastiaenen[1], J.A.M.C.F Verbunt[1]

[1]Maastricht University, MAASTRICHT, The Netherlands
[2]Rijndam Rehabilitation, ROTTERDAM, The Netherlands

Introduction: Chronic musculoskeletal pain (CMP) in adolescents can negatively affect physical, psychological and social functioning. A multimodal graded exposure in vivo rehabilitation program (MRP) was developed to reduce functional disability. **Objective:** To evaluate effectiveness of MRP in reducing functional disability for adolescents with CMP, compared with usual care (CAU).
Patients: Adolescents, 12-21 years, with CMP, reporting pain-related fear, and referred to outpatient rehabilitation treatment. **Methods:** Pragmatic multicentre randomized clinical trial. Data analysis by intention-to-treat mixed model analysis. Primary outcome was functional disability (Functional Disability Inventory) at baseline, 2, 4, 10, 12 months. Protocol adherence was evaluated. MRP has an adolescent and parent module and used graded exposure in vivo therapy to improve functional ability by reducing pain-related fear. CAU is based on the principles of graded activity. Treatment duration varied 7-16 weeks. **Results:** 53 adolescents (93% female, mean age 16.0 years, SD 1.87) were analyzed (25 MRP, 28 CAU). Adolescents in MRP showed a clinically relevant and statistically significant improvement in functional ability (estimated mean difference at least -8.81, p-values ≤ 0.01) compared with CAU at all time points. Protocol adherence by treatment teams in MRP was high and contamination by the alternative intervention was low. **Discussion and conclusions:** MRP leads to a significantly larger and clinically relevant decrease in functional disability compared to usual care. Therefore, implementation of MRP in rehabilitation care is recommended. **Clinical message:** A multimodal graded exposure in vivo rehabilitation program is effective in reducing functional disability in adolescents with chronic musculoskeletal pain reporting pain-related fear.

C. Dekker- carolien.dekker@maastrichtuniversity.nl

12. Longterm effects of chronic pain rehabilitation program

I. Ronchetti, J.P. van Wingerden

Spine & Joint Centre, ROTTERDAM, The Netherlands

Introduction: Chronic non-specific low back pain (CNLBP) is a negative determinant in quality of life. Pain rehabilitation programmes aimed at improving life quality predominantly use shortterm effect parameters. little is known on longterm effect of rehabilitation programmes for CNLBP. **Objective:** In this study term post-treatment effects were inquired in

patients that received therapy 2-5 years ago. **Patients:** CNLBP patients (n=1814) completing an 8-weak rehabilitation treatment between 2012 and 2015 were requested to participate a digital survey. **Methods:** Primary and secundary outcome measures were obtained. Results are compared with initial values and shortterm outcomes. Data is paired analysed. **Results:** Over all response was 40.5% (2012(32.6%), 2013(37.5%), 2014(44,5%) and 2015(46%). Non-responders score higher on initial and shortterm outcomes (VASPain and QBDS). Shortterm Global Perceived Effect is lower in non-responders. Shortterm QBDS and VASPain decrease persists at longterm. QBDS VASPain

Baseline : 45.3±15.0 50.8±22.3
Shortterm : 28.2±13.1 30.2±21.8
Longterm : 28.0±19.0 27.0±23.9

Shortterm global perceived effect predicts long term level of global perceived effect: lower initial results apt to lead to lower long term result. **Discussion and conclusion:** CNLBP patients show longterm beneficial effects of this specific rehabilitation program. Initial improvement in quality of life, pain and global perceived effect holds longterm in most patients. Better outtake scores may predict better longterm results. There is no information from the non-reponders. Therefore the over all result might render less positive. **Clinical message:** This specific rehabilitation program for CNLBP renders positive longterm effect.

I. Ronchetti- IRonchetti@sjcn.nl

Free Paper Session A6

Chair: Nicole Voet MD PhD

13. Effects, effect duration and adverse effects of extracorporeal shock wave therapy in children with spastic cerebral palsy: A systematic review

T.W. Janssen[1], M.A. Kuijper[1], J.M. Voorman[2], O. Verschuren[2]

[1]De Hoogstraat Rehabilitation, UTRECHT, The Netherlands
[2]Center of Excellence for Rehabilitation Medicine Utrecht, UTRECHT, The Netherlands

Objective: To systematically review the literature on the effects of extracorporeal shock wave therapy (ESWT) on: 1) the domains of the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY); 2) effect duration; 3) adverse effects in children with spastic cerebral palsy (CP). **Search strategy**: A systematic literature search was performed using three databases (Pubmed, Cochrane Library and PEDro Library). Search terms used were Cerebral Palsy, Muscle Spasticity, Shock Wave Therapy and terms fitting the ICF-CY. **Selection of articles:** Two authors selected the articles based on the following criteria: 1) the use of ESWT to treat CP related spasticity; 2) baseline and follow up measurements; 3) at least one outcome on one domain of the ICF-CY. **Evaluation of articles and results:** The quality of the articles was assessed using the PEDro score and the levels of evidence according to the American Association of Cerebral Palsy and Developmental Medicine. Seven of 33 identified studies were included. The level of evidence and quality of the articles were moderate to good. There is strong evidence that ESWT reduces resistance against passive movement and improves joint mobility and gait cycle. Studies described a sustained significant effect at four, eight and/or twelve weeks on the same outcomes. Only mild, tolerable, short lasting adverse effects were mentioned. **Conclusion:** ESWT seems a promising treatment to reduce symptoms of spasticity regarding children with spastic CP and has an effect duration between four and twelve weeks. Moreover, none or relatively small side effects were observed.

T.W. Janssen- t.janssen@dehoogstraat.nl

14. Evaluation of a tailored eHealth application for personalized ALS care

J. Helleman[1], R.M. van Eenennaam[1], A. Beelen[1], E.T. Kruitwagen[1], W.J. Kruithof[1], M. Slappendel[1], L. van den Berg[2], J.M.A. Visser-Meily[1]

[1]Center of Excellence in Rehabilitation Medicine, BCRM, UMCU, UTRECHT, The Netherlands
[2]Department of Neurology, Brain Center Rudolf Magnus, UMCU, UTRECHT, The Netherlands

Introduction: Amyotrophic Lateral Sclerosis (ALS) is a rapid, progressive neuromuscular disease, resulting in increasing loss of function at a highly variable rate. Multidisciplinary care is currently provided through regular visits to the clinic. In order to facilitate personalized ALS care, eHealth technology was implemented allowing patients to self-monitor their health, receive personalized feedback, and enabling the ALS care team to monitor patients' health status in between hospital visits. **Objective:** Evaluate patients' experiences and satisfaction with the ALS eHealth application. **Patients:** Patients with ALS that used the eHealth application for at least 4 months (N=15). **Method:** A mixed methods study consisting of an online questionnaire and a semi-structured interview with patients. Descriptive statistics were used for questionnaire data and content analysis was conducted on the transcribed interviews. **Results:** Results from the questionnaire showed that all patients intend to continue using the application and would recommend it to other patients. 93% of patients experienced more control over their care and 60% reported that the eHealth application supported in decision making. Interviews revealed a high level of satisfaction with the continuous monitoring and personalized feedback,

that offered some reassurance. Patients reported an increased awareness of their health status and felt better informed. **Discussion and conclusions:** Patients with ALS consider eHealth a valuable extension of their usual care. Future study can reveal long-term compliance and benefits of the eHealth application. **Clinical message:** eHealth may help to provide a continuation of care in between clinic visits and can facilitate personalized care for patients with ALS.

J. Helleman- j.helleman@umcutrecht.nl

15. Is Fitbit Charge 2 a feasible instrument to monitor daily physical activity in persons with spinal cord injury?

M.C. Maijers[1], O. Verschuren[1], J.M. Stolwijk-Swüste[1], C.F. van Koppenhagen[2], S. de Groot[3], M.W.M. Post[4]

[1]UMC Utrecht, Utrecht University |De Hoogstraat Rehabilitation, UTRECHT, The Netherlands
[2]University Medical Centre, UTRECHT, The Netherlands
[3]UMCG and Amsterdam Rehabilitation Research Center | Reade, AMSTERDAM, The Netherlands
[4]UMCG and UMCU |De Hoogstraat Rehabilitation, UTRECHT, The Netherlands

Introduction: As self-reported diaries are insufficient to monitor daily physical activity including training accurately, we used the opportunity of the HandbikeBattle 2017 to conduct a pilot study on the usage of a multi-sensor activity tracker in persons with spinal cord injury (SCI)**.**
Objective: To investigate the feasibility of a low cost and widely used fitness tracker to monitor daily physical activity in wheelchair-dependent persons with SCI.
Patients: Six persons with SCI of the Utrecht HandbikeBattle team.
Methods: All participated to wear a Fitbit Charge 2® 24 hours a day for at least 2 weeks and were questioned about the usefulness and user-friendliness of this device and data was compared with self-reported physical activity.
Results: Five participants wore the device nonstop for 2 weeks and most continued usage for multiple weeks and months. Beside high compliance, we found enthusiasm about the direct feedback and user-friendliness and valid data amongst our participants. Data collected during 3 months on 3 participants and during 8 months on one of them showed the possibility to detect training days and observe interpersonal and intrapersonal variation in daily physical activity level. **Discussion and conclusions:** A commercially available multi-sensor wrist device like the Fitbit Charge 2® is a promising instrument to monitor training schedules of wheelchair athletes and daily activity levels among wheelchair-users with SCI. **Clinical Message:** Our study illustrates how innovative measurement methods, commercial dashboard and log data can be used in patients, as they benefit from direct feedback of their training activity and timely intervention.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/8DCRM/add_456339_03f7130d-013b-4478-ae37-e7a887a6357a.jpg
Caption 1: Marike Maijers

Picture 2: https://www.eventure-online.com/parthen-uploads/89/8DCRM/add_1_456339_03f7130d-013b-4478-ae37-e7a887a6357a.JPG
Caption 2: Team Utrecht HBB 2017

M.C. Maijers- m.maijers@dehoogstraat.nl

16. Clinical experience with continuous intrathecal baclofen administration using an external pump as a screening method when improvement of function needs to be assessed

A.E. Koopman, G.J. Snoek, A.V. Nene

Roessingh Centre for Rehabilitation, ENSCHEDE, The Netherlands

Introduction: To determine whether intrathecal baclofen (ITB) is a suitable treatment for a patient, an alternative procedure to a bolus of baclofen is the use of an external pump with continuous ITB. **Objective:** To describe our clinical experience with continuous ITB using an external pump as a screening method. **Patients:** Forty-three patients with disabling spasticity due to different causes treated in our centre between 2002 and 2016. **Methods:** Patients received continuous ITB for 1 to 10 days via an intrathecal catheter connected to an external pump. Main outcome measures: effect of ITB on spasticity using Modified Ashworth Score (MAS) or description of spasticity given by the physician, changes in general function, adverse effects during trial and whether patients received pump implant or not. Data was collected retrospectively. **Results:** In 4 patients trial was discontinued before effect on spasticity could be determined, in the other 39 patients ITB had a positive effect on spasticity. Mean MAS before trial was higher than at the end of trial (2.4 versus 0.8, z = - 4.572, p = 0.000). Effect on function could be determined in 34 patients. Post-lumbar puncture headache was the most frequent adverse effect (44%). Thirty-one patients received pump implant. **Discussion and conclusion:** When deciding on pump implantation, patient's opinion should be taken into consideration. Measures to reduce adverse events should be explored. **Clinical message**: Screening with continuous ITB using an external pump has an important advantage over that with bolus of ITB when assessing effect on function.

A.E. Koopman - annewil_koopman@hotmail.com

Free Paper Session A7

Chair: Jeanine Voorman MD PhD

17. Preliminary results of feasibility and preferences in the use of a virtual reality simulation in children with acquired brain injury.

F.J.M. Verheul[1], L.A. Spreij[1], J.M.A. Visser--Meily[1], T.C.W. Nijboer[2]

[1]University Medical Centre Utrecht and De Hoogstraat Rehabilitation, UTRECHT, The Netherlands
[2]Brain Centre Rudolf Magnus, Centre of Excellence for Rehabilitation Medicine, UTRECHT, The Netherlands

Introduction: Cognitive complaints are frequently reported by children with acquired brain injury (ABI), causing significant disabilities in daily life. The current neuropsychological paper tasks do not capture the complexity of daily life and often fail to objectify cognitive complaints. Virtual Reality (VR) simulations might overcome this discrepancy as it creates a situation resembling daily life activities. We evaluate the feasibility of VR in children with ABI and the preference for either a VR headmounted display (HMD) or a computer monitor (CM), in comparison to healthy children. **Method:** Pediatric patients (n=6) were recruited in De Hoogstraat rehabilitation, healthy children (n=11) amongst colleagues and family. Children were tested with both setups and were asked to buy products in a virtual supermarket. Afterwards they had to fill out a questionnaire about preferences and side effects. **Results:** 16/17 children (94%) finished the task. Overall, 28% of the children reported cyber sickness, 33% reported headache. Overall, 56% had no specific preference, 39% preferred HMD and 5% CM. Of children with ABI 67% had no preference and 17% preferred HMD. Of children reporting cyber sickness, 72% preferred using CM. **Conclusion:** Cyber sickness was experienced in 28% of the children. Overall 56% had no preference for either HMD or CM, 39% preferred HMD and 5% preferred CM. **Take home message:** Both HMD and CM can be used with Children with ABI. Which setup to use should be discussed with the patient, preferences should be taken into account. Hardware development will most likely reduce side effects.

F.J.M. Verheul- f.j.m.verheul@gmail.com

18. Home-based training in young children with unilateral Cerebral Palsy: lessons learned from the early closure of a randomized clinical trial.

Y.J. Janssen-Potten[1], L.W. Beckers[2], E.A. Rameckers[1], M.L. Schnackers[3], P.B. Aarts[4], J.J. van der Burg[4], R.J. Smeets[2]

[1]Adelante, HOENSBROEK, The Netherlands
[2]Maastricht University, MAASTRICHT, The Netherlands
[3]Radboud University, NIJMEGEN, The Netherlands
[4]St maartenskliniek, NIJMEGEN, The Netherlands

Introduction: The effectiveness of intensive therapy programs to improve bimanual performance in children with unilateral Cerebral Palsy (uCP) has been abundantly shown. The next step in paediatric rehabilitation is bimanual training by the parents in the child's own environment, to establish retention of therapy effects and healthcare independence. In 2015, a randomised clinical trial (RCT) was set up to develop and test the effectiveness of two home-based training protocols to improve bimanual performance of the young child with uCP: the COAD study. In 2017 this trial was closed early due to an insufficient number of children for inclusion. **Objective:** To identify factors that have impeded the execution of the COAD trial from the perspective of researchers, physicians, therapists, managers, financiers, and parents. **Participants:** All relevant

stakeholders mentioned above. **Methods:** A summative evaluation of the research project was performed. All stakeholders individually reflected on the COAD study from their own perspective during informal conversational interviews. The principal evaluator extracted and clustered the impeding factors from the interview notes. The results of each stakeholder group were validated by member checking with the contributors and thereafter combined. **Results:** Themes that emerged suggested that the discontinuance of the COAD trial was associated with at least three key factors, i.e.: collaboration, organisation, and finance. **Discussion and conclusions:** Partnership with parents instead of an advisory role, effective communication about content, organisation and finance between all collaborators involved may enhance research success. **Clinical message:** Lessons learned from this study can inform future clinical and implementation research.

Y.J. Janssen-Potten- y.janssen@adelante-zorggroep.nl

19. Family Impact and Parents' Psychosocial Care experiences in Cerebral Palsy (CP) Rehabilitation Care; Preliminary results from a cross-sectional survey

M. van der Holst[1], J. Kuijlaars[2], F. van Vree[1], D. Steenbeek[3], C. Bouwhuis[2], H.J. van Wageningen[1], T.P.M. Vliet Vlieland[1]

[1]Rijnlands Rehabilitation Center, LEIDEN, The Netherlands
[2]Sophia Rehabilitation, THE HAGUE, The Netherlands
[3]Leiden University Medical Center, LEIDEN, The Netherlands

Introduction: Although it is known that the impact of CP on the family is considerable, knowledge on experiences with family-centered psychosocial care is limited. **Objective:** This cross-sectional study aimed to investigate the impact of CP on families, children's Quality of Life (QoL) and parents' experience with psychosocial care.
Patients/Methods: Families of children aged 2-16 years old, who received rehabilitation treatment/counselling for CP were eligible. Participating parents completed the PedsQL™ Family-Impact-Module (FIM:5 scales/scores 0-100/higher scores, better functioning/QoL), Pediatric-Outcome-Data-Collecting-Instrument-NL (PODCI-NL:5 scales/scores 0-100/higher scores, better functioning/QoL), numeric-rating-scales regarding burden of care (0-10/higher score, higher burden) and questions on psychosocial care experiences. Associations between family impact and care burden and QoL were examined using Pearsons' correlation. **Results:** Parents of 64 children (44 Boys/mean age 9.9 years,SD:3.2;30/64 in regular education) participated. Mean FIM and PODCI-scores were 67.5-75.2/100.0 and 52.1-74.8/100.0. Mean physical and psychological burden scores were 4.4(SD:2.8) and 5.3(SD:2.7). Sixteen parents (25%) reported that there was not enough attention for family impact. Parents felt that there was not enough attention for themselves (33%), their child (17%) and siblings (38%). Worse FIM scores were associated with higher physical/psychological burden and lower PODCI scores(r0.30-0.66,p<0.05-p<0.001). **Discussion/Conclusion:** Parents reported impact on their families especially when perceiving higher burdens of care and lower QoL of their child with CP. Over 1/3rd felt that there is not enough attention in rehabilitation practice for family/parents/siblings. **Clinical message:** Psychosocial care is addressed as important in rehabilitation practice but there is room for improvement of care for families (including siblings) of children with CP.

M. van der Holst- meh@rrc.nl

20. We12BFit! Improving physical fitness and lifestyle physical activity in 7-12 year old children with developmental coordination disorder- preliminary results

-

P. Braaksma- p.braaksma@umcg.nl

Free Paper Session A8

Chair: Janneke Stolwijk-Swüste MD PhD

21. Trunk and head involvement in persons with DMD and SMA when performing seated activities to develop supportive devices

L.H.C. Peeters[1], I. Kingma[2], J.H. van Dieën[2], I.J.M. de Groot[3]

[1]Radboud University Medical Center, NIJMEGEN, The Netherlands
[2]Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, AMSTERDAM, The Netherlands
[3]Donders Centre for Neuroscience, Radboud University Medical Center, NIJMEGEN, The Netherlands

Introduction: Arm movements influence movement and muscle activity in the trunk and neck. These interactions may be affected by muscle weakness in patients with progressive neuromuscular disorders. Insight in such interactions is necessary to develop dynamic supportive devices for trunk and head. **Objective:** Primary, determining differences in trunk and head involvement when performing seated activities between persons with Duchenne muscular dystrophy (DMD), spinal muscular atrophy (SMA) and healthy controls (HC). Secondary, develop dynamic supportive devices for trunk and head. **Patients:** Eighteen participants with DMD (7-20 years), 17 participants with SMA (6-62 years) and 25 healthy controls (6-21 years) were included. **Methods:** Participants performed several activities in seated position, like reaching forward and sideward, drinking and writing. Maximum muscle torque and maximum surface electromyography (sEMG) were measured during maximum voluntary isometric contractions. Three-dimensional movements and normalized sEMG during task performance were analyzed. **Results:** Movements patterns differed between DMD and HC, and seem to differ from SMA too (preliminary results). Normalized trunk muscle activity was significantly higher in patients with DMD compared to HC and seem even higher in patients with SMA (when comparing patients with the same arm function level). Using the developed trunk or head supportive device leads to decreased muscle activity. **Discussion and conclusions:** Trunk and head movements in daily tasks differ between DMD, SMA and HC, and an increased trunk muscle effort was found. Muscle effort could be reduced by using dynamic supportive devices. **Clinical message:** Differences are present between DMD and SMA when performing activities and should be taken into account for interventions.

L.H.C. Peeters- laura.hc.peeters@radboudumc.nl

22. The diagnostic value of the single leg heel rise test compared to ankle push-off insufficiency shown by 2D gait analysis

W.F. Ten Thije-de Boer

Heliomare, WIJK AAN ZEE, The Netherlands

Introduction: The majority of MS patients experience difficulties in walking. Insufficient ankle push-off is an important cause. The heel rise test (HRT) represents calf muscle strength. The gold standard for measuring ankle push-off sufficiency is an instrumented time-consuming gait analysis. **Objective:** To determine the diagnostic value of the single leg HRT for identifying ankle push-off sufficiency. **Patients:** Cross-sectional study, with 76 patients with mild to moderate MS (median EDSS score 3.2), age 27-67 years. **Methods:** Single leg HRT was used for calf muscle-strength. 2D gait analysis, surface Electromyography and Ground Force Reaction distinguished 3 clinically meaningful gait classes induced by increasingly insufficient push-off. ROC curves were calculated to find the optimal HRT cut-off point to accurately distinguish between adequate and inadequate push-off. Kruskall Wallis test assessed the relation between HRT (minimal - (sub)optimal score),median gait speed and SF36 physical functioning. **Results:** A strong relationship was found between HRT and push-

off (AUC = 0.86; 95% CI ,754 -,978). The optimal cut-off point is 10 heel rises (sensitivity>0.76, specificity >0.90). Clinical relevance was confirmed by the significant relationship of sl-HRT with gait speed and SF36pf. **Discussion and conclusions:** Single leg HRT has an excellent discriminative ability for ankle push-off. Under the assumption of the same results in a 3D gait analysis, this might give the implication that single leg HRT >10 indicates a sufficient push-off and no additional gait analyses is needed. **Clinical message:** The single leg heel rise test is an accurate diagnostic test for identifying ankle push-off sufficiency in MS.

W.F. Ten Thije-de Boer- mwfdeboer@gmail.com

23. How (in)active are ambulatory people with spinal cord injury? Preliminary results of a prospective cohort study

K. Postma[1], J.B.J. Bussmann PhD[2], T. van Diemen PhD [3,4,5], Prof. M.W. Post PhD [4,5], R..J.G. van den Berg-Emons[2]

[1]Rijndam Rehabilitation Institute, ROTTERDAM, The Netherlands
[2]Erasmus MC, ROTTERDAM, The Netherlands
[3] Sint Maartenskliniek, Nijmegen, The Netherlands
[4] UMCG, Groningen, The Netherlands
[5] Kenniscentrum Revalidatiegeneeskunde Utrecht, The Netherlands

Introduction: Physical activity (PA) plays an important role in health and longevity. People with spinal cord injury (SCI) are known to have extremely low PA levels. Previously we found that PA in wheelchair-dependent people with SCI strongly declined after inpatient rehabilitation and remained extremely low (1,2). It is unknown whether people with SCI who can walk have similar unfavorable (changes in) PA. **Objective:** To study (changes in) PA during the first year after inpatient rehabilitation in ambulatory people with SCI. **Methods:** PA (walking, cycling, running and wheelchair-driving) was objectively measured with accelerometer-based activity monitors at three moments in time: before discharge of inpatient rehabilitation (T1), and at 6 (T2), and 12 (T3) months after discharge. PA was expressed in min/24 hours. **Patients:** Data of 26 participants who successfully finished all three measurements was analyzed. Mean (SD) age was 56.1 (14.9) years, 15 were male, 15 had tetraplegia, and all participants had a motor incomplete lesion. **Results:** PA increased significantly over time (p =0.032); mean (SD) at T1 was 89 (6), T2 105 (9), T3 110 (11) min/24hours. **Discussion and conclusions:** On average, (changes in) PA levels were more favorable than found previously in wheelchair-dependent people with SCI. Nevertheless, variation between persons was large and several people had extremely low PA. **Clinical message:** These preliminary results suggest that as a group ambulatory people with SCI are less at risk of inactivity than people who are wheelchair-dependent. Future studies are necessary to determine ambulatory subgroups at risk.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/8DCRM/add_1_458100_ace6515c-fe0e-4255-aaaa-85a57dd328e9.png

K. Postma- k.postma@erasmusmc.nl

24. Participation and mental well-being of mothers of home-living patients with spinal muscular atrophy

C.H.P. Cremers[1], M.J. Fischer[2], E.T. Kruitwagen-van Reenen[2], R.I. Wadman[2], J.J. Vervoordeldonk[3], M. Verhoef[2], J.M. Visser-Meily[2], W.L. van der Pol[2], C.D. Schröder[2]

[1]De Hoogstraat Utrecht, UTRECHT, The Netherlands
[2]University Medical Center Utrecht ,UTRECHT, The Netherlands
[3]Reade, AMSTERDAM, The Netherlands

Introduction: Spinal muscular atrophy (SMA) causes severe physical limitations but also has a major impact on the lives of parents. **Objective:** Our aim was to investigate participation and mental well-being (burden, emotional distress and satisfaction with participation) of mothers of home-living children and adults with SMA. **Patients:** Mothers of children and adults with SMA were recruited as part of a cross-sectional study of patients with SMA who visited the UMCU between September 2010 and October 2015. **Methods:** Caregiver burden was assessed with the Caregiver Strain Index (CSI), emotional distress with the Hospital Anxiety and Depression Scale (HADS) and satisfaction with participation with the Utrecht Scale for Evaluation of Rehabilitation-Participation (USER-P). **Results:** Forty-eight mothers of patients with SMA living at home were included. Seventy-seven percent of the mothers had paid work. A substantial proportion of the mothers (76%) perceived high caregiver burden. Burden, emotional distress and satisfaction with participation were comparable between mothers of children and adults with SMA. Higher participation in social and leisure activities was related to lower caregiver burden, emotional distress and greater satisfaction with participation. **Discussion and conclusion:** Mothers of patients with SMA experience high caregiver burden and emotional distress. Participation in social and leisure activities is a strong determinant of mental well-being. **Clinical message:** More attention should be paid to the level of burden and mental well-being of primary caregivers of patients with SMA. In addition, caregivers should be motivated to keep participating in social and leisure activities.

C.H.P. Cremers- c.cremers@dehoogstraat.nl

Mini-symposia and workshops - index

Thursday 8 November

Friday 9 November

Parallel Session A – Workshops and Freepapers

Thursday 8 November, 12.55-15.30

Parallel Session A: Workshops

A1. S.M.A.S.H. (= Smoking prohibited, Move more, Alcohol in moderation, Sleep well, and Healthy nutrition): smashing ideas for a healthy life style

A2. Advanced exercise testing and training in rehabilitation

A1. Workshop: S.M.A.S.H. (= Smoking prohibited, Move more, Alcohol in moderation, Sleep well, and Healthy nutrition): smashing ideas for a healthy life style

The WVBS has propagated the importance of an active life style, but a healthy life style involves more than merely being physically active. During this workshop we explore more components of healthy behaviour using the acronym S.M.A.S.H.: Smoking prohibited, Move more, Alcohol in moderation, Sleep well, and Healthy nutrition. In order to learn about existing programs on life style intervention, we sent questionnaires to all Dutch rehabilitation centres and rehab departments. During the workshop we summarize results and zoom into illustrative initiatives. We aim to come to some consensus on how we can address healthy life style during and after rehabilitation.

We also want to share your ideas on SMASH. So please think about the following:
Smoking prohibited. Nicotine is an important risk factor in cardiovascular disease and cancer. Should smoking areas be banned from hospitals and rehab centres? What makes a successful 'stop smoking' support team?
Move more. Regular exercise and movement, makes patients (feel) more fit. What can rehab teams do to stimulate their patients to become and stay active? Which smartphone apps do you use to monitor how much (or little) exercise your patient gets?
Alcohol in moderation. The use of alcohol and drugs is related to cancer, cardiovascular disease, diabetes and Alzheimer. How can we make the topic alcohol (ab)use less of a taboo? Is alcohol consumption allowed in your rehab centre? Should a rehab team help a patient to reduce alcohol consumption?
Sleep well. Inadequate sleep is associated with an increase in body weight, cardiovascular disease and stress. But what can we offer patients who do not sleep well? Do we prescribe benzodiazepines or mindfulness?
Healthy nutrition. Bad eating habits contribute to cardiovascular disease and cancer. Should rehab departments offer a standard nutritional consult? Which hospital or rehab centre has a 'healthy food' policy?

You may become a bit disillusioned, because SMASH seems pretty hard and disciplinary on health habits. However, our workshop will give you smashing ideas on what you could offer to improve healthy life style for your patients.

Chair: Floor Hettinga PhD, SFHEA, FECSS, FACSM, University of Essex

Speakers: Jorinde Spook, Janneke Haisma, Robert van de Graaf, Rogier Broeksteeg, Marco Mensink

Programme:

1. The key to successful behaviour change: how to start and how to keep up? – Jorinde Spook
2. Results of a Dutch questionnaire on life style interventions in rehabilitation settings – Janneke Haisma
3. Intermezzo
4. Discussion on S.M.A.S.H. themes
5. Stop Smoking – Robert van de Graaf
6. Move More – Rogier Broeksteeg
7. Healthy Nutrition – Marco Mensink
8. Round up

A2. Workshop: Advanced exercise testing and training in rehabilitation

Adequate physical fitness is an important prerequisite for health and participation, the more so in people with chronic disabilities. For them improved physical fitness not only enhances health and reduces morbidity, but also allows them to cope with the higher metabolic demand of daily activities that frequently conjoin motor disabilities. In recent years excise testing and training has gained more and more attention within the context of (clinical) rehabilitation. This expertise has currently left the stage of development and is implemented within the regular rehabilitation programs of several rehabilitation centers, for instance for patients after stroke, amputation and spinal cord injury. In this workshop experts from this field will demonstrate the current application of exercise testing and prescription within the rehabilitation program. Next to a general introduction into some basic principles of exercise physiology, a life demonstration of a maximal cardiopulmonary exercise test (CPET) will be given. Subsequently, interactive case discussion will be held in which participants learn to interpret results from exercise testing and to translate these results into exercise prescription for the individual patient. At the end of the workshop a guideline for implementing a testing and training facility in a rehabilitation center will be presented.

Chair: Han Houdijk, Rienk Dekker

Speakers: Han Houdijk, Rienk Dekker, Floor Groot , Janneke Dilling, Stijn de Bruijn, Ilse Blokland

Programme:

1. Brief introduction into exercise physiology - Han Houdijk, Human Movement, Scientist Heliomare Rehabilitation, Wijk aan Zee / Floor Groot Sports Physician, Heliomare Rehabilitation, Wijk aan Zee and Sport en Beweegkliniek Haarlem

In this presentation some basic principles from exercise physiology will be reviewed to lay a foundation for interpreting test results and prescribing exercise training. It will cover potential limitations related to the cardiovascular, respiratory and muscular system for exercise and physiological responses of these systems to training stimuli.

2. Life demonstration of a maximal cardiopulmonary exercise test (CPET) - Floor Groot / Ilse Blokland, Human Movement Scientist, Heliomare Rehabilitation, Wijk aan Zee

The use of ergospirometry to assess exercise capacity and risks will be demonstrated and explained.

3. Interpreting a cardiopulmonary exercise test: interactive case discussion - Janneke Dilling, Physician AssistantScientist / Rienk Dekker, Rehabilitation Physician / Stijn de Bruijn, Sports Physician University Medical Center Groningen, Department of Rehabilitation Medicine, Groningen

In this interactive session participants will practice interpretation of the test results for different cases. These interpretations will be evaluated in a group discussion led by experienced exercise team.

4. Exercise prescription: interactive case discussion - Floor Groot / Ilse Blokland

In this interactive session different participants will practice designing an exercise prescription for different cases. These prescriptions will be evaluated in a group discussion led by experienced exercise team.

5. How to implement a facility for testing and training in your rehabilitation center? Tips and tricks - Rienk Dekker

In this final presentation practical issues will be discussed for those who would like to implement the knowledge obtained in the workshop in their rehabilitation program.

Parallel Session B – Mini-symposia and workshops

Thursday 8 November, 14.00-15.30

Parallel Session B: Workshops and mini-symposia

- **B3.** The start of the national cerebral palsy registry in The Netherlands
- **B4.** Home-based training in children with unilateral cerebral palsy: chances and challenges
- **B5.** Individualized training for residents in rehabilitation medicine: A new approach by Klimmendaal-Radboudumc-Rijnstate-Sint Maartenskliniek-Tolbrug (OOR-ON)
- **B6.** eRehabilitation: development, evaluation and implementation of eHealth in rehabilitation
- **B7.** Neuropathic pain among people with spinal cord injury: innovations in assessment and treatment The
- **B8.** Ronnie Gardiner Method, sets the brain in motion!

B3. Mini-symposium: The start of the national cerebral palsy registry in The Netherlands

Much is still unknown about the optimal treatment of motor disorders in cerebral palsy (CP), and there is currently a lot of diversity in the approach. CP is the main cause of physical disability in children. With the start of a national CP registry in The Netherlands in 2016, we create the basis for a national follow-up program and treatment registry for people with CP. The ultimate goal of the registry is to improve quality of treatments, reduce secondary problems and see to it that every child, and eventually adult, receives optimal treatment at an individual level, improving activities and participation on the short- and longterm. In the symposium, a multidisciplinary team consisting of a pediatric physiciatrist, pediatric neurologist and orthopedic surgeon, together with the CP registry manager and the director of the patients' association will discuss diagnostics and (evidence for) current treatments for motor disorders in CP. We will discuss how secondary problems such as hip luxation can be prevented and treated, according to the CP guidelines, and the role of a national registry in this. The registry will be demonstrated and we will outline subsequent steps in its development with special attention to the parent/patient perspective.

Chair: Annemieke Buizer
Speakers: Annemieke Buizer, Jeroen Vermeulen, Melinda Witbreuk, Janneke Hazelhoff, Martijn Klem

Programme:
General Introduction - Annemieke Buizer MD PhD, pediatric physiatrist, VUmc Amsterdam

1. Etiology of and diagnostics in CP – Prof. Jeroen Vermeulen MD PhD, pediatric neurologist, MUMC+ Maastricht
2. Treatment options in CP –how can a registry help to inform the clinician? – Annemieke Buizer MD PhD, pediatric physiatrist, VUmc Amsterdam
3. Hipluxation in CP: screening and treatment according to the guidelines – Melinda Witbreuk MD PhD, orthopaedic surgeon, OLVG/VUmc Amsterdam
4. The Netherlands CP registry: outline, demonstration and future steps – Janneke Hazelhoff MSc, manager Netherlands CP Registry, Amsterdam/Utrecht
5. Parent and patient participation in the CP registry – Martijn Klem, MSc, director BOSK, patient organization for people with CP

B4. Mini-symposium: Home-based training in children with unilateral cerebral palsy: chances and challenges

Home-based training programs are increasingly acknowledged as important interventions for rehabilitation for children with unilateral Cerebral Palsy (CP). Clinical experiences and scientific evidence are growing. Relevant questions to be addressed are for example: What are the possibilities of home-based training from the patient and family perspective?What barriers of home-based training should be overcome and how can this be realized? In this mini-symposium, a parent will reflect on the need for home-based training. Thereafter, characteristics and evaluations of existing home-based training programs will be presented. The background and content of two recently developed interdisciplinary, home-based bimanual training programs will be discussed in detail. One program is based on an implicit motor learning approach whereas the other follows an explicit motor learning approach. This distinction was made in consideration of current evidence regarding parental stress as an adverse effect of home-based training. The concept of therapy-related parental stress will be introduced, followed by an explanation of the clinical approach to minimize therapy-related parental stress in these specific home-based training programs. We will end with an interactive discussion with the audience regarding the chances and challenges of home-based training in children with unilateral CP from a family, clinical and scientific perspective.

Chair: Prof. dr. Rob Smeets,

Speakers: Laura Beckers, Rob Smeets, Yvonne Janssen-Potten, Jan van der Burg, Eugene Rameckers, Pauline Aarts, Joris Verweij

Programme:

1. General introduction - Prof. dr. Rob Smeets, Professor in Rehabilitation Medicine and physiatrist, Maastricht University, Maastricht, Netherlands
2. The need for and possibilities of home-based training from a family perspective – Joris Verweij, parent of a child with CP
3. Characteristics and evaluations of existing home-based training programs - Yvonne Janssen-Potten PhD, Research coördinator, Adelante, HOENSBROEK, Netherlands
4. Relevance and content of two interdisciplinary, home-based bimanual training programs - Laura Beckers, PhD candidate, Maastricht University, Maastricht, Netherlands
5. Therapy-related parental stress: how to keep it low during home-based training? - Jan van der Burg PhD, Health care psychologist/remedial educationalist, Sint Maartenskliniek, Nijmegen Netherlands
6. Interactive discussion - Eugene Rameckers PhD, Senior researcher Adelante, Hoensbroek, Netherlands & Pauline Aarts MD PhD, Head department of pediatric rehabilitation and researcher Sint Maartenskliniek, Nijmegen, Netherlands

B5. Mini-symposium: Individualized training for residents in rehabilitation medicine: A new approach by Klimmendaal-Radboudumc-Rijnstate-Sint Maartenskliniek-Tolbrug (OOR-ON)

Due to governmental policy, training of residents in rehabilitation medicine should be shortened. This was the start to think about a new training program for our residents. Our goal was to develop a training which is challenging, future-proof and brings out the best of residents, trainers and the involved rehabilitation centers and hospitals. Due to the individualization of the postgraduate training, the starting point was to guarantee a basic profile and we wanted to

offer space for further individualization. Together with the trainers and trainees, we analyzed the entire program and adjusted it so that the basic program is the same for everyone. After this a specialization is possible for neurologic, orthopedic, hospital and child rehabilitation. Next to this we offer three scientific profiles: an educational, managerial or patient centered research profile, with tailored made programs for the resident. During this mini-symposium we will explain our program and the profiles.

Chair: Ilse van Nes, physiatrist, Dept. Of Rehabiliation, Sint Maartenskliniek Nijmegen

Speakers: Imelda de Groot, Petra van Kampen, Gery. Bos4, Henk Hendricks5, D. van Duijnhoven2, A. Zielman6

Programme:

1. General introduction - Imelda de Groot MD PhD, physiatrist, Dept. Of Rehabilitation, Radboudumc, Nijmegen.
2. Basic part of the program - Petra van Kampen MD PhD physiatrist, Rehabilitation Center Klimmendaal, Arnhem / Gery Bos MD PhD physiatrist, Rehabilitation Center Tolbrug, Den Bosch
3. Specialized part of the program - Henk Hendricks, physiatrist, Dept. Of Rehabilitation, Rijnstate, Arnhem
4. The scientific profiles - Hanneke van Duijnhoven, physiatrist, Dept of Rehabilitation, Radboudumc, Nijmegen
5. Experiences of a resident - Anna Zielman MD, resident, circuit East Netherlands

B6. Mini-symposium: eRehabilitation: development, evaluation and implementation of eHealth in rehabilitation

The use of e-health grows rapidly, also in rehabilitation care. eRehabilitation has the potential to support people's self-management, by offering innovative solutions for the delivery of information, the monitoring of relevant aspects of health status, the provision of tailored advice and treatment and interaction with health care providers and peers. Successful development, evaluation and implementation of eRehabilitation is a constant challenge that often requires non-conventional approaches. The development of eRehabilitation is a co-creation process in a real life setting including all relevant stakeholders, e.g. clinicians, patients and their caregivers, developers, ICT-departments and supervisory bodies. To contribute to the evidence, eRehabilitation research is eminent but often demands research methodologies other than conventional methods including product iterations and action-directed research methods. For successful and sustained adoption of effective eRehabilitation a structured implementation strategy is a prerequisite. This mini-symposium brings together different experts from the field of eHealth (in rehabilitation) to share perspectives and experiences with professionals working in the field (e)Rehabilitation.

Chair: Jorit Meesters, PhD, senior researcher, LUMC, The Hague University of Applied Sciences, Sophia Rehabilitation Center, Leiden and The Hague, The Netherlands.

Speakers: Jorit Meesters, Martijn van der Ent, Marthe Ford, Marit Dekker

Programme

1. Co-creation with different stakeholders in a Living lab: developing in a real life setting - Martijn van der Ent MSc, The Hague University of Applied Sciences, Sophia Rehabilitation Center, Leiden and The Hague, Cue2Walk International, WeGo-Out International, The Netherlands.
2. Evaluating eRehabilitation: eHealth for sleep disorders after acquired brain injury in a RCT - Marthe Ford MSc, PhD-candidate, psychologist, Heliomare rehabilitation center, Wijk aan Zee, The Netherlands.
3. Telemedicine in rehabilitation - Marit Dekker PhD, researcher, Roessingh Research and Development, Enschede, the Netherlands.
4. Implementing eRehabilitation: strategies in practice – Jorit Meesters PhD, senior researcher, LUMC, The Hague University of Applied Sciences, Sophia Rehabilitation Center, Leiden and The Hague, The Netherlands.

5. Plenary discussion

B7. Mini-symposium: Neuropathic pain among people with spinal cord injury: innovations in assessment and treatment

Neuropathic pain (NP) is one of the most severe secondary health conditions among people with spinal cord injury (SCI). With a pooled prevalence of 53%. NP is not only highly frequent, but it is also highly treatment-resistant. It is rated by people with SCI as one of the health problems with the strongest impact on their participation and quality of life. NP is the pain that "gives the doctor a headache". The etiology of NP is complex, which hampers the development and application of effective treatments. International consensus on the classification of subtypes of NP has emerged only recently. The assessment of NP is limited, because it is mainly based on patient's self-report. Recently, more objective assessments of NP, such as quantitative sensory testing (QST) systems, are emerging. Furthermore, in medical rehabilitation, treatment of NP is strongly focused on medication. Medication, however, is often only partly effective and can bring serious side effects. A wide range of non-medical treatments, some "alternative" or "controversial", are used by people with SCI, but information on this use and the effectiveness of non-medication treatments of NP is largely lacking. This mini-symposium highlights developments in the assessment and non-medical treatment of NP after SCI.

Chair: J.M. Stolwijk-Swüste MD PhD, Rehabilitation centre De Hoogstraat Utrecht Netherlands

Speakers: Janneke Stolwijk-Swüste, Albère Köke, Charlotte van Laake - Geelen, Marcel Post
1Rehabilitation center De Hoogstraat, Utrecht, Netherlands
2Adelante Hoensbroek and Maastricht University Medical Center (MUMC+), Hoensbroek, Netherlands
3University Medical Center Groningen and a senior researcher at the Center of Exc, Utrecht, Netherlands

Programme

- Patients' perspectives on pain after SCI - Charlotte van Laake MD, rehabilitation physician, Adelante Hoensbroek and Maastricht University Medical Center (MUMC+), Hoensbroek, Netherlands
- Use of non-medical treatments for NP after SCI - Marcel Post, PhD, professor of SCI rehabilitation, University Medical Center Groningen and a senior researcher at the Center of Exc, Utrecht, Netherlands
- Quantitative Sensory Testing in neuropathic pain - Albère Köke, PhD, physical therapist and senior researcher, Adelante Hoensbroek and Maastricht University Medical Center (MUMC+), Hoensbroek, Netherlands
- Cannabis and topical creams in treatments of NP after SCI - Janneke Stolwijk-Swüste, MD PhD, rehabilitation physician, Rehabilitation center De Hoogstraat, Utrecht, Netherlands

B8. Workshop: The Ronnie Gardiner Method, sets the brain in motion!

In addition to Ronnies keynote lecture during the morning program, Ronnie Gardiner and Mariken Jaspers will take the participants a good step further. In this workshop they will demonstrate how RGM is applied in the daily neuro-therapeutical practice. They will explain and show how the method can be adapted to different target groups, different levels and therapeutic objectives. Obviously they will link the method to the present scientific insights which all support the use of music, rhythm and a multimodal approach as powerful drivers of rehabilitation where it comes to brains affected by trauma or by a chronical progressive condition. Mostly performed in group sessions, but also one-on-one, patients consider RGM to be hard work and as well as fun. The latter unlike many neurological interventions. This is an important reason for high compliance rates. In order to personally experience the effects of combining rhythm, music,

movement and speech, the participants will be invited to join in a few challenging exercises. This will help understand why your target group may benefit from the RGM.

Speakers:
Ronnie Gardiner, keynote speaker
Marieken Jaspers, (neuro)physiotherapist

Mariken Jaspers has over 30 years of experience working as a self-employed (neuro)physiotherapist. She is specialized in Parkinson's disease (PD) and was co-writer of the first guideline for the treatment of PD by physiotherapists in the Netherlands. She was also one of the first physiotherapists involved in ParkinsonNet, a concept which nowadays is being copied in many other countries worldwide. Mariken was trained by Ronnie Gardiner in London and became master RGM-practitioner in 2013. Since 5 years she uses RGM as a welcome and useful addition to the regular therapeutical treatment of people with brain injury, PD, MS and early stages of dementia, in groups as well as in individual settings. Together with André de Jong she founded RGM the Netherlands to train physio-, speech-, music- and occupational therapists as well as (special needs) teachers and to promote the RGM and its possibilities in both healthcare and education in the Netherlands and other European countries.

Parallel Session C – Mini-symposia and workshops

Friday 9 November, 08.30-10.00

Parallel Session 3: Workshops and mini-symposia

- **C1.** New priorities in paediatric research
- **C2.** To participate or not to participate: that is the challenge why and how to promote meaningful participation of children and young adults with disabilities?
- **C3.** Behavior change towards a healthy lifestyle: needs more than just an advice
- **C4.** Innovative interventions to support informal caregivers
- **C5.** Working towards healthy living in patients with chronic pain: A stepped care approach
- **C6.** The role of rehabilitation in the changing world of SMA
- **C7.** Gait analysis and adaptations; using new ideas to tackle old problems in gait classification and training
- **C8.** Handcycling: the way to go from a physiological and biomechanical perspective

C1. Workshop: New priorities in paediatric research

Excellent research starts with excellent research questions. In order to be excellent, a research question must arise from the desire to improve the interventions, therapies or daily lives of patients and persons with a disability. But who can decide what are the most urgent topics, and where the need for improvement is greatest? In the past, in general researchers decided on the research topics and focus and, unintentionally, have tended to pursue their perceived priorities – which may not be the same as those of patients and families. In recent years the identification and prioritization of research topics have changed. Both clinicians and patients contributed to the "VRA Kennisagenda", whereas parents of children in pediatric rehabilitation developed a top 10 of research priorities; Research Agenda Pediatric Rehabilitation ("Onderzoeksagenda Kinderrevalidatie"). In the Kennisagenda and Onderzoeksagenda Kinderrevalidatie, patients, parents and doctors together describe the problems they perceive as most urgent. In this workshop we will present and discuss the Onderzoeksagenda Kinderrevalidatie and the VRA Kennisagenda, including the methods through which they were developed. The second half of the workshop is an interactive session discussing next steps, including questions like: how can we come from priority lists to excellent research? How can we join forces in this effort? And how can we ensure that excellent research does indeed lead to interventions that minimize our most pressing problems?

Chair: Martijn Klem

Speakers: Martijn Klem, Marjolijn Ketelaar, Karen van Meeteren, Minke Verdonk, Jeanine Voorman

Programme

1. Introduction: the merits of identifying research priorities together - Martijn Klem MSc, director BOSK, Utrecht.
2. Developing the "Onderzoeksagenda Kinderrevalidatie" - Marjolijn Ketelaar, De Hoogstraat Rehabilitation and UMC Utrecht, Netherlands
3. Parental priorities: presentation of the "Onderzoeksagenda Kinderrevalidatie" - Karen van Meeteren and Minke Verdonk
4. Joined forces from a doctor's perspective: the Onderzoeksagenda and the VRA Kennisagenda: Jeanine Voorman, physician in Rehabilitation Medicine, University Medical Center Utrecht, Utrecht, Netherlands
5. From research priorities to real-life answers: interactive session on the question how doctors, patients and parents can benefit from the research that the Kennisagenda and Onderzoeksagenda will bring about - Martijn Klem.

C2. Mini-symposium: To participate or not to participate: that is the challenge! Why and how to promote meaningful participation of children and young adults with disabilities?

Participation of children, youth and transition-age young adults is vital for the development of physical, psychological and social emotional skills, competences and well-being, the shaping of identity and subsequently a major determinant of healthy living and future outcome. Consequences of a rehabilitation diagnosis often result in restrictions in participation particularly when compared to peers without disabilities. Research in paediatric rehabilitation mainly focussed on physical and cognitive outcomes (body functions and structure) and their determinants. More recently studies also focus on psychosocial outcome, including activities, participation and personal /environmental factors. Moreover, development and implementation of both assessments and interventions including programs and policies to promote meaningful participation children and youth in rehabilitation. The aim should be to decrease the impact of a rehabilitation diagnosis on participation of youth and their families. The mini-symposium 'Participation' brings together different experts from the field of paediatric rehabilitation and research to share perspectives and experiences with professionals working in the field.

Chair: Arend de Kloet

Speakers: Jan Willem Gorter, Arend de Kloet, Caroline van Heugten, Frederike van Markus, Barbara Piskur

Programme

- General introduction - Arend de Kloet MSc PhD, associated professor The Hague University of applied sciences and Sophia Rehabilitation Center, Den Haag, Netherlands
- Participation as means and an outcome in pediatric rehabilitation - Prof. Jan Willem Gorter MD PhD, physiatrist, School of Rehabilitation Science at McMaster University, Hamilton, Canada
- Systematic review of instruments for measuring participation in children with acquired brain injury – Prof. Caroline van Heugten PhD, neuro psychologist, Maastricht university, Maastricht, Netherlands
- Meedoen! Results of a Dutch multi-center study about participation for children with TBI - Frederike van Markus MD, physiatrist, PhD candidate, Sophia Rehabilitation Center, Den Haag, Netherlands
- Participation and parents - Barbara Piškur PhD, occupational therapist, Zuyd University, Heerlen, Netherlands
- Discussion about joined challenges and agenda.

C3. Mini-symposium: Behavior change towards a healthy lifestyle: needs more than just an advice

A growing volume of evidence shows that people with a chronic disorder have poor fitness, inactive lifestyles, and unfavorable body composition. Given the detrimental impact on fatigue, health, participation, and quality of life, rehabilitation treatment should strongly focus on changing behavior towards a healthy lifestyle. This requires comprehensive and evidence-based lifestyle programs, tailored to the individual patient, and comprising fitness training and coaching towards optimal physical activity and diet.

Scientific research by Erasmus MC and Rijndam Rehabilitation in Rotterdam, in collaboration with several Dutch rehabilitation centers, was the basis for developing such lifestyle programs. These programs are now offered in Rijndam Rehabilitation as regular care for people with a chronic disorder such as spinal cord injury, cerebral palsy and acquired brain injury.

Aim of this mini-symposium is to share knowledge and our experiences regarding these lifestyle programs. The mini-symposium offers a diverse program in an interactive environment and is relevant for therapists, physicians, and researchers.

Chair: Rita van den Berg-Emons
Speakers: Wilma van der Slot1,2, MD, PhD, Rutger Osterthun1,2, MD,Rogier Broeksteeg1, PT,1,Rita van den Berg-Emons2, PhD

1Rijndam Rehabilitation, 2Erasmus University Medical Center; both in Rotterdam, The Netherlands

Programme

1. Introduction
   - Scientific knowledge on fitness, physical activity, sedentary behavior, and body composition in people with cerebral palsy and spinal cord injury
   - Promising techniques for behavioral change
   - Scientific research on lifestyle programs in chronic disorders
     - Learn 2 Move (cerebral palsy)
     - Act-Active (spinal cord injury)
2. Lifestyle programs in Rijndam Rehabilitation
   - Content
   - Lessons learned from implementation
     - Brain injury
     - Wheelchair-users (spinal cord injury, amputation)
3. Measuring resting metabolic rate
   - Why important?
   - How?
4. Experiences of patients participating in the Rijndam lifestyle programs
5. Panel discussion
6. Conclusion

C4.Mini-symposium: Innovative interventions to support informal caregivers

Family members who provide support for patients in the rehabilitation phase may experience difficulties in aspects of caring, high levels of burden and impaired quality of life The majority of existing interventions focus primarily on the needs of patients, not on the needs of the significant others (usually the partner but can be everyone who is important in one's well-being). Empowering both patients and significant others as part of rehabilitation treatment may help to reduce this gap, reduce distress and enhance participation in daily activities. At the Center of Excellence for Rehabilitation Medicine Utrecht different intervention studies are conducted with the aim to support informal caregivers (ALS Naasten support, POWER-study, CARE4Carer, CommuniCare).

Subabstracts
ALS Naasten Support
Informal caregivers of patients with Amyotrophic Lateral Sclerosis (ALS) or Progressive Muscular Atrophy (PMA) face stressful demands due to severe impairments and prospect of early death of the patients they care for. A psychosocial support program aimed at enhancing feelings of control over caregiving tasks and reducing psychological distress was developed to support these caregivers. The program is based on Acceptance and Commitment Therapy and consists of 1 face-to-face contact, 6 online guided modules and 1 telephone contact. The effects of the program are investigated in a randomized controlled trial. The program and preliminary results will be presented.

POWER-study

The POWER-study is a multicentre controlled trial carried out in twelve Dutch rehabilitation centres. Over 300 clinically admitted patients participate (≥18 years, diagnose: acquired brain injury, spinal cord injury or leg amputation) as well as their significant others. During 3 family group conferences (FGC's), supported by the social worker, the patient, significant other and their social network, will be stimulated in collaboration, to set up participation goals, determine the needed help, and make a concrete action plan. Empowerment as the primary outcome is operationalized as self-efficacy and participation. The implementation of FGC and preliminary results will be presented.

CARE4Carer is a blended care intervention for partners of patients with acquired brain injury. The intervention consists of a nine-session web-based support program and two face-to-face consultations with a social worker. The support program, called Brain Injury - Moving forward together (in Dutch: "Hersenletsel – hoe samen verder?"), contains evidence-based support strategies such as psychoeducation, skill building, problem solving, and improving feelings of mastery. The effects of the intervention are investigated in a randomized controlled trial. The CARE4Carer intervention and preliminary results will be presented.

CommuniCare
Of all people who suffer a stroke, about a third is diagnosed with aphasia. Communication disorders can have serious consequences. Persons with aphasia (PWA) have higher risks for depression and for receiving inadequate care in health care settings. Little is known about the needs and wishes of proxies concerning communication with PWA. The CommuniCare- project is a multicenter project aimed at investigating needs and wishes of health care professionals and proxies, to develop an intervention aimed at improving communication between health care professionals, PWA and their proxies. The CommuniCare intervention will be implemented in health care settings where process evaluations and outcome measurements will be carried out. The intervention and preliminary results will be presented.

Chair: Anne Visser-Meily, Hoogleraar Revalidatiegeneeskunde, Kenniscentrum Revalidatiegeneeskunde UMC Utrecht en De Hoogstraat Revalidatie

Speakers: Jessica De Wit1, Chantal Hillebregt1, Eline Scholte1, Vincent Cox1, Maren van Rijssen, Anne Visser-Meily2

1Center of Excellence for Rehabilitation Medicine Utrecht, UTRECHT, Netherlands
2Kenniscentrum Revalidatiegeneeskunde UMC Utrecht / De Hoogstraat Revalidatie, Nederland

Programme

1. Introduction: informal caregiving in rehabilitation - Anne Visser-Meily, Hoogleraar Revalidatiegeneeskunde, Kenniscentrum Revalidatiegeneeskunde UMC Utrecht en De Hoogstraat Revalidatie
2. A blended psychosocial support program for partners of patients with Amyotrophic Lateral Sclerosis and Progressive Muscular Atrophy - Jessica de Wit, Center of Excellence for Rehabilitation Medicine Utrecht, UTRECHT, Netherlands
3. POWER- study: The implementation of Family Group Conferences among high risk patients of chronic disability and their significant others - Chantal Hillebregt and Eline Scholten, Center of Excellence for Rehabilitation Medicine Utrecht, UTRECHT, Netherlands
4. The CARE4Carer blended intervention for partners of patients with acquired brain injury (Vincent Cox) Center of Excellence for Rehabilitation Medicine Utrecht, UTRECHT, Netherlands
5. Conclusion - Anne Visser-Meily, Hoogleraar Revalidatiegeneeskunde, Kenniscentrum Revalidatiegeneeskunde UMC Utrecht en De Hoogstraat Revalidatie

C5. Mini-symposium: Working towards healthy living in patients with chronic pain: A stepped care approach

A healthy lifestyle is crucial for everyone. But becoming more active can be a challenge for those confronted with disability, such as related to chronic pain. For this reason, it is important to provide every patient the optimal support to change behavior towards a healthy lifestyle and his/her desired level of quality of life. In this context, the ability to participate again in activities as work and sports, are important elements for most patients with chronic pain and for this reason, often important goals to focus upon during rehabilitation. But what works for whom in order to change activity related behavior in patients with chronic pain? How can we best select the optimal treatment for every patient? Nowadays, collaboration between health-professionals in primary, secondary and tertiary care seems essential in order to ensure both quality and costs of chronic pain rehabilitation care. In this mini-symposium we will discuss important elements in rehabilitation towards regaining a healthy active lifestyle with pain. In addition, we will focus on new developments in the organization of a transmural model of rehabilitation care that supports regaining an active lifestyle for patients with chronic pain.

Chair:
Jeanine Verbunt Professor and consultant in rehabilitation medicine Maastricht-university en Adelante zorggroep

Speakers: Loes Swaan, Michiel Reneman, Ben Evers, Cynthia Lamper

Programme

1. What works for whom?: Multidimensional analysis in patients with complex pain problems - Loes Swaan - Rijndam Rotterdam
2. Back to work: Rehabilitation towards and by means of work participation - Michiel Reneman, UMCG Groningen
3. Back to sports: The challenge of moving with pain - Ben Evers, UMCG Groningen
4. The network pain rehabilitation Limburg; an example of a stepped care transmural network - Cynthia Lamper, Adelante/UM Maastricht

C6. Workshop: The role of rehabilitation in the changing world of SMA

Spinal muscular atrophy (SMA) is a rare neuromuscular disoreder. The disorder is caused by a genetic defect in the SMN1 gene. Spinal muscular atrophy manifests in various degrees of severity, which all have in common progressive muscle wasting and mobility impairment. Lifetime rehabilitation care is therefore necessary for optimal functioning. In December 2016 the antisense oligonucleotide nusinersen (Spinraza) was approved for the treatment for children and adults with SMA. This symbolizes the start of a new era of treatment possibilities resulting in changing prognosis and outcomes. New treatments call for a new approach in rehabilitation care for SMA patients. The new consensus statement on SMA standard of care describes that there has been increasing evidence that a proactive approach from rehabilitation perspective may influence trajectories of progression. In this workshop we will discuss different topics in care for children with SMA, based on the new consensus statement as well as experiences in the SMA expertise centre.

Chair: Marjolein Verhoef, PhD, MD in Pediatric Rehabilitation Medicine, Wilhelmina Kinderziekenhuis/UMCUtrecht

Speakers:
Marjolein Verhoef, Inge Cuppen, Danny van der Woude, Marise Heul, van der, Maarten Fischer
University Medical Center Utrecht, Netherlands

Programme

1. General introduction - Marjolein Verhoef MD PhD in Pediatric Rehabilitation Medicine University Medical Center Utrecht, Netherlands
2. Neurological background SMA and the development of different drug treatment options, now and in the future - Inge Cuppen MD PhD, Pediatrician-Neurologist, University Medical Center Utrecht, Netherlands
3. Motor development in SMA and effects of Spinraza; practical consequences for physical therapy - Danny van der Woude , Pediatric Physical Therapist, University Medical Center Utrecht, Netherlands
4. Feeding and swallowing problems in children and adults with different types of SMA: insight and advises for practice - Marise van der Heul MSc., Speech Language Therapist, University Medical Center Utrecht, Netherlands
5. Additional problems as respiratory problems, nutritional status, spine deformity and contractures, as well as management opportunities - Marjolein Verhoef
6. Quality of life and psychosocial care for patients, caregivers and parents; support and needs - Maarten Fischer MSc, Psychologist, University Medical Center Utrecht, Netherlands
7. Finally the tips an tops of the network rehabilitation care for children and adults with SMA in the Netherlands can be discussed

C7. Mini-symposium: Gait analysis and adaptations; using new ideas to tackle old problems in gait classification and training

Effective and efficient gait, without pain or fatigue, is closely associated with good functioning in a daily living environment. Poor balance control and reduced gait speed together account for a major reduction in the quality of life and are predispositions for many chronic health problems. In this regard, gait analysis and interpreting gait adaptations has been of prime importance for more that 20 years for both practitioners as well as scientists in the field of human movement and rehabilitation sciences. Nowadays, with the help of intelligent equipment and advanced computer algorithms, new possibilities arise for both primary and secondary prevention of mobility related diseases as well as for the development of new interventions within the area of rehabilitation. To understand how rehabilitation medicine can make use of these innovations to prevent disabilities, or, when necessary, try to recover from impairments, rehabilitation specialists have to gain insights into the interaction between patients' motor learning abilities and the techniques that are available in this rapid developing multidisciplinary area. During this minisymposium we will discuss how assessments and exercises, in challenging conditions, on an instrumented treadmill, can be of help in a clinical setting to improve (pathological) gait patterns. We discuss some of the benefits but also some of the disadvantages of these techniques and how they relate to motor learning, cognitive functioning, brain activity and performance in able-bodied persons, to benefit clinical decision making.

Chair: Helco van Keeken

Speakers: Helco van Keeken, Yuhan Zhou, Christian Greve, Tom Buurke, Iris Hagoort, Sylvana Weiland

Programme

1. Introduction - Helco van Keeken PhD, assistant professor, University of Groningen / UMCG / Center for Human Movement Sciences, The Netherlands
2. Machine learning and classification of gait, its relevance for the clinical setting - Yuhan Zhou, University of Groningen, UMCG, Center for Human Movement Sciences, Groningen, Netherlands
3. The role of musculoskeletal modelling in clinical decision making - Christian Greve, University of Groningen, UMCG, Center for Human Movement Sciences, Groningen, Netherlands
4. The margins of stability during motor learning - Tom Buurke, University of Groningen, UMCG, Center for Human Movement Sciences, Groningen, Netherlands
5. Mapping brain activity during motor learning in gait training – Iris Hagoort, University of Groningen, UMCG, Center for Human Movement Sciences, Groningen, Netherlands

6. Bilateral effects of assymetrical movement guidance in the Lokomat - Sylvana Weiland, University of Groningen, UMCG, Center for Human Movement Sciences, Groningen, Netherlands
7. Final thoughts - Helco van Keeken

C8. Minisymposium: Handcycling: the way to go from a physiological and biomechanical perspective

Handcycling is getting more and more popular in the Netherlands for mobility and sports. Handcycling is more energy efficient and leads to less shoulder load compared to wheelchair propulsion. Therefore, handcycling is stimulated during and after rehabilitation for a healthy life for people with a lower limb disability. One of the initiatives to stimulate a healthy lifestyle via handcycling is the HandbikeBattle. The HandbikeBattle is a handcycling mountain race among 12 Dutch rehabilitation centers with teams of ex-patients. The goal of this HandbikeBattle is to challenge the ex-patients to train and to become mentally and physically fit by climbing this mountain in the handbike. However, it is important for this race but also for daily life to have an optimal training program and to optimize handcycling equipment to prevent overuse injuries. That means that we need more information on handcycling test protocols, (monitoring of) handcycling training programs and how to optimize the handcycle-user configuration. The objective of this mini-symposium is to give the state-of-the-art regarding optimizing handcycling from a physiological and biomechanical perspective.

Chair: Sonja de Groot

Speakers: Sonja de Groot, Ingrid Kouwijzer, Vicky Tolfrey, Cassandra Kraaijenbrink, Ursina Arnet

Programme

1. Handcycling: a short introduction - Sonja de Groot, PhD,

Amsterdam Rehabilitation Research Center | Reade, Amsterdam, The Netherlands; University of Groningen, University Medical Center Groningen, Center for Human Movement Sciences, Groningen, The Netherlands;

2. The HandbikeBattle study: Testing & training - Ingrid Kouwijzer, PhD student HandbikeBattle

Research & Development, Heliomare, Wijk aan Zee; Amsterdam Rehabilitation Research Center | Reade, Amsterdam, The Netherlands; University of Groningen, University Medical Center Groningen, Center for Human Movement Sciences, Groningen, The Netherlands;

3. Optimization of handcycling for elite sports: Training and technical guidance - Vicky Tolfrey, PhD

The Peter Harrison Centre for Disability Sport, School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, UK

4. Biomechanics of handycling propulsion technique - Cassandra Kraaijenbrink, PhD student

Department of Movement Science, Institute of Sport Sciences, University of Münster, Münster, North Rhine-Westphalia, Germany; Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen, Groningen, Groningen, the Netherlands

5. Shoulder load during ADL handcycling compared to manual wheelchair propulsion - Ursina Arnet, PhD

Swiss Paraplegic Research, Nottwil, Switzerland;

Parallel Session D – Debate and PhD Thesis Session

Friday 10 November, 10.45-11.45

4a. PhD thesis session
4b. Debate: Healthy living for everyone! Really??

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

Chair: prof. Jeanine Verbunt MD PhD

During this session, the best PhD theses in the field of rehabilitation medicine in the academic year 2017-2018 are presented. These dissertations are nominated by professors in rehabilitation medicine. A selection of the theses was made by the PhD Award jury. During the session the jury will select the winner from the nominees of the PhD Award Rehabilitation Medicine 2018. The nominees will be announced in September.

Programme

Four lectures of the nominees of PhD Award Rehabilitation Medicine

- Family needs and the role of information in paediatric rehabilitation care – ***Mattijs Alsem***
- Optimizing Cardiac Rehabilitation – ***Nienke ter Hoeve***
- Upper extremity function in Duchenne Muscular Dystrophy – ***Mariska Janssen***
- Reactive neurobiological recovery after ischaemic stroke? – ***Caroline Winters***

Family needs and the role of information in paediatric rehabilitation care – Mattijs Alsem

Parents of children with physical disabilities play an important role in the functioning of the child and family. Because the needs for care and information differ between families and change in time, it is important to address these needs explicitly. Parents have a great need for information. This can be information about medical topics, but also experience-based knowledge. Parents often search for information on the internet, but find it difficult to find reliable information. To help parents identify their (family) needs, we compiled a list of 189 possible needs from the literature and from interviews with parents and professionals, forming the basis for a digital instrument, the WWW-roadmap. The WWW-roadmap aims to support parents in formulating their needs, looking up reliable information and asking questions to the appropriate professional. We studied whether using this instrument helped parents in the process of empowerment and self-management. In interviews, parents indicated that they value the WWW-roadmap as a reliable source of information, and that the WWW-roadmap helps to think of topics for which they want to look up information. This helps them in keeping comprehensive view of their situation. Yet we saw no difference in the empowerment of parents or changes in the consultation. In order to really help parents with taking a more equal role in the consultation, it is important to not only look at their information needs, but also at other conditions, such as facilitation by professionals.

Mattijs Alsem (born in 1985) is a paediatric rehabilitation physician in the Academic Medical Centre in Amsterdam. In 2017 get received his PhD degree for his thesis called 'Family Needs and the role of information in paediatric rehabilitation care'. He is specialized in the care for children aged 0-4 with (developmental) disabilities and their families. His research focusses on family involvement and support in paediatric (rehabilitation) care, and working together with parents in research. Mattijs is a member of the Dutch network Family Integrated Care, and also has a special interest in participating in the medical education of students of the University of Amsterdam.

Optimizing Cardiac Rehabilitation – Nienke ter Hoeve

Cardiac rehabilitation (CR) improves health (e.g. blood pressure) and risk of mortality. However, results of this thesis showed that only small improvements in moderate-to-vigorous intensity physical activity (MVPA) and sedentary behaviour are reached. We focused on the added value of two behavioural lifestyle interventions on top of standard CR. A total of 914 patients with an acute coronary syndrome were randomized to: 1)3 months of standard CR (CR-only); 2)3 months of standard CR with three pedometer-based, face-to-face physical activity group counseling sessions followed by 9 months of aftercare with three lifestyle, face-to-face group counseling sessions (CR+F); or 3)3 months of standard CR, followed by 9 months of aftercare with six lifestyle, telephonic counseling sessions (CR+T). Compared to standard CR, adding physical activity counselling sessions (initial phase CR+F) improved step count with an additional 500 steps/day. Furthermore, time spent in prolonged MVPA periods increased. There were no changes in total MVPA time or sedentary behaviour. At completion of the CR+F aftercare program, improvements in step count partly diminished. The additional improvements in prolonged MVPA were maintained. No additional benefits were found for CR+T. We recommend that face-to-face physical activity group counselling sessions be added to CR, although aftercare optimization is needed.

Nienke ter Hoeve studied human movement sciences at the VU university in Amsterdam and obtained her Master's degree in 2009, with a specilization in rehabilitation medicine. After working for two years as a junior researcher in a collaboration between Capri Cardiac Rehabilitation and the Deparment of Rehabilitation Medicine of the Erasmus University Medical Center in Rotterdam, she started her PhD training in the same collaboration. She obtained her PhD degree on 29th of May 2018. Currenly, she is working as a PostDoc researcher focusing on cardiac rehabilitation for persons with obesity and female participants.

Upper extremity function in Duchenne Muscular Dystrophy – Mariska Janssen

Duchenne Muscular Dystrophy is a severe neuromuscular disorder, that weakens arm muscles among other muscles. In order to remain independent as long as possible, new aids are being developed to support arm function. To develop these aids, more information in needed on arm function. Therefore, this thesis examined arm function in boys and men with Duchenne Muscular Dystrophy, using questionnaires and motion analysis. The results showed that already at a young age arm function is reduced, and that during the course of the disease the amount of limitations increase. This coincides also with increased pain and stiffness levels. First limitations can be seen during activities with the shoulder (reaching), and later on movement with the elbow (drink) and hand (write) become more difficult. We also found that corticosteroid use and an active lifestyle positively influence arm function, and that pain, stiffness and the occurrence of scoliosis have a negative impact on arm function. Using these results new aids can be developed and clinicians can prescribe better treatments to preserve arm function.

Mariska Janssen, born in Boxmeer on September 18th, 1986, received her MSc degree in Human Movements Sciences in 2011 from the Radboud University Nijmegen. In 2012 she started her PhD studies at the department of rehabilitation in the Radboud University Medical Centre. The topic of her PhD studies was upper extremity function in boys and men with Duchenne Muscular Dystrophy, which was part of the Flextension A-Gear project, focused at the development of new arm supports/exoskeletons for boys and men with Duchenne Muscular Dystrophy. She successfully defended her thesis titled 'Upper extremity function in Duchenne Muscular Dystrophy' on November 2nd 2017. Currently, Mariska is working as a post-doc researcher at the department of rehabilitation at Radboudumc, where she performs several studies related to neuromuscular disorders, 3D motion analysis, arm supports, fatigability and martial arts training. She co-authored 14 pear reviewed publications and presented the results of her study at various international conferences.

Reactive neurobiological recovery after ischaemic stroke? Prognosis & intervention - Caroline Winters

Stroke remains one of the leading causes of long-term disability worldwide. The challenge for neurorehabilitation and neurological research is to reduce impairments and to optimize activity and participation of patients. The main aims of this PhD thesis were to gain insight into early prediction of outcome after stoke and to investigate whether it is possible to influence neurobiological recovery with early applied interventions focused at the arm. The results show that the course of neurological recovery is predictable in the majority of patients and that the expected recovery is in proportion to the impairment within 72 hours after stroke. Recovery of activities seems to be accelerated by three weeks of modified Constraint Induced Movement Therapy, however the results show no effect of therapy on the recovery of arm functions. It is therefore still unclear whether we can influence neurobiological recovery. To gain more insight, future research should focus on the underlying mechanisms responsible for recovery. In order to find rehabilitation therapies that can influence the degree of reactive (i.e. spontaneous) neurobiological recovery, it is essential for future studies to include repeated measurements at fixed moments after the stroke and to divide patients into subgroups using early biomarkers for neurobiological recovery.

Caroline Winters studied Human Movement Sciences at the VU University in Amsterdam. After graduating cum laude she started her PhD study at the department of Rehabilitation Medicine of the VU University Medical Center under supervision of prof.dr. G. Kwakkel and dr. E.E.H. van Wegen. During her PhD study she engaged in the EXPLICIT-stroke trial and the 4D-EEG study for which she performed clinical and electroencephalography measurements. On 17 January 2018 she successfully defended her PhD thesis. Additionally, in 2016 she started working at the NIPED Institute, specialized in prevention, early diagnostics and E-health. She currently works as a project manager at the Isala Heart Centre.

D2. Debate: Healthy living for everyone! Really??

Chair: Hans Oosterkamp

Active living and a healthy lifestyle are seen as important elements of modern life. It is almost unthinkable nowadays that we don't have an idea of what type of activities are good for us and prolong our longevity. We walk, run, bike and are reading about living up to low-carb and high-protein diets, see the benefits of omega-3 proteins, vitamins and flavonoids. We are truly bombarded online and offline about these subjects. And how can one be against an active living or healthy lifestyle? Even more, nowadays it is thought that coaching by medical specialists on topics as active living and healthy lifestyle are seen as an important part of what should be talked about during consultation with patients. But is this what our jobs as medical specialists is about? Are we truly prepared to give this type of advice? What does this mean for our resident education? And should we then live by example and practice what we preach or do we allow adult people to make their own choices, and respect them even if we don't agree, just as they might not agree with ours? Do you have a (strong) opinion on this subject and want to share this or do you want to encounter a lively debate on this topic? Please come and join us.

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

Parallel Session E – Mini-symposia and workshops

Friday 9 November, 13.20-14.50

Parallel Session E: Workshops and mini-symposia

- **E1.** Strength and fatigue of the upper limb in children with Unilateral Spastic Cerebral Palsy. New insights in measurement and training
- **E2.** Sexual Health Care in physical rehabilitation medicine: pitfalls and challenges
- **E3.** Value Based Health Care in Rehabilitation: From Hype to Reality
- **E4.** Measuring cognitive functioning in rehabilitation: brief screening and outcome measurement
- **E5.** The application of sensors to objectively monitor orthopaedic footwear adherence in research and clinical practice
- **E6.** Rehabilitation, Sport & Active Lifestyle: now and in the future
- **E7.** Patient Participation in Research: Challenges and Opportunities
- **E8.** PROFITS: opportunities to improve prediction and services early post stroke.

E1. Mini-symposium: Strength and fatigue of the upper limb in children with Unilateral Spastic Cerebral Palsy. New insights in measurement and training

Clear evidence and well performed research related to strength measurement and training of the upper limb in children with Unilateral Spastic Cerebral Palsy (USCP) are still lacking. Untill now no clear answers can be given on the following questions:

- Which tests should be used: grip strength tests or task-oriented strength tests?
- Is grip strength of the Non-Affected Hand diminished compared to typically developing children?
- Is strength and/or muscle fatigue important in the upper limb in children with USCP?
- What type of training should be performed, task-oriented strength or muscle related strength?

In this mini-symposium we will address above mentioned questions. The need of strength testing and training in children with USCP as well as the results of grip strength measurement and task-oriented strength measurement studies will be presented. After these presentations the results of the first study on muscle fatigue of the upper limb and the preliminary results of the multi center Dutch RCT of Task-oriented Arm Strength training (TOAST-CP) will be presented. We will end with a panel discussion with the audience regarding the pros and contra's of the presented results and special focus will be on the translation of these results to clinical practice of rehabilitation in children with USCP.

Chair: Prof. Rob Smeets MD PhD, Maastricht University, The Netherlands

Speakers: Eugene Rameckers, Koen Dekkers, Mellanie Geijen, Lieke Brauers

Programme

1. Are children with Unilateral CP weak in the non affected upper limb - Koen Dekkers MSc, Revant, Breda, The Netherlands
2. Task-oriented strength measurement of the upper limb in children with CP - Mellanie Geijen MSc, Maastricht University, The Netherlands
3. Grip fatigue of the upper limb in children with CP and TD, does it exist? - Lieke Brauers MSc, Hasselt University, Belgium
4. Effect of Task-oriented arm strength training in children with CP on strength and upper limb skills - Eugene Rameckers PhD, Adelante Rehabilitation, The Netherlands

E2. Mini-symposium: Sexual Health Care in physical rehabilitation medicine: pitfalls and challenges

Sexual health issues are more prevalent among people with a chronic illness or physical disability than among the general population. Although sexual health care in the rehabilitation setting in the Netherlands is a growing field of interest, integrating Sexual Health in the overall care for rehabilitation patients has proven to be a challenge. With this mini-symposium we will introduce you to different levels of the exciting field of Rehabilitation Sexology. On a Macro-level: how does SHC fit into the vision for specialist rehabilitation medicine in the year 2025 - where network-medicine, prevention and self-management will be important? On a Meso-level: how can you organize SHC within your operational interdisciplinary Team? On the Micro-level we will focus on the importance and meaning of SHC for the rehabilitation patients. Special attention will be given for the so-called validation-problems of youngsters in physical rehabilitation who experience a disturbance in their social-sexual development.

Chair: Woet Gianotten, Consultant Rehabilitation Sexology, UHD Medical Sexology UMC, Utrecht and Erasmus MC, Rotterdam

Speakers: Riet Pieters, Egbert Kruijver, Jim Bender, Ans Mellink

Programme

1. "Sexual Health Care; What's it all about? Developments in Rehabilitation Sexology; looking towards the year 2025.": Sexual Health Care is not only important for the quality of life of people with disabilities or chronic illnesses, but is also an essential part of a holistic approach. What are the opportunities and dilemmas to integrate SHC in the modern Rehabilitation Medicine, anno 2025? - Egbert Kruijver, Social Worker MSW Sexologist NVVS - Sophia Rehabilitation, The Hague; De Hoogstraat, Utrecht; Private Practice, Nieuwegein. Chairman of the Dutch NVVS special interest group for rehabilitation sexology.

   "Rehabilitation Sexual Health Care is team work; an interdisciplinary approach": Jim will base his talk on years of experience, working in and training of rehabilitation teams in sexual health care. The focus is the integration of sexual health care within an operational interdisciplinary team in the rehabilitation setting. Keywords: rehabilitation sexology is teamwork, 'sexuality aware attitude', and professional communication. Background literature: "Training rehabilitation teams in sexual health care: a description and evaluation of a multidisciplinary intervention", in: Disability & Rehabilitation, January 12th 2017. - Jim Bender, Health Psychologist Sexologist NVVS - Sophia Rehabilitation. The Hague; Private Practice, The Hague. Trainer and consultant at Bender & Pieters, Training & Consultancy in Rehabilitation Sexology, Woerden. Has had a pioneering role in the Dutch rehabilitation sexology since 1995.
2. "Sexuality reborn; Sexual Health Care for adults in physical rehabilitation": This talk will provide insight into the work of a rehabilitation sexologist treating adult patients in the Dutch rehabilitation setting. What are the sexual health issues that patients have and how are they addressed? What are helpful interventions? Special topics:

intimacy, incontinency and pelvic physiotherapy, problems with intimacy & sex requires rehabilitation work within a relationship. - Riet Pieters, MD Sexologist NVVS - Heliomare, Wijk aan Zee, Private Practice, Woerden. Works with people with SCI, Chronic Pain, brain injury and CP. Trainer and consultant at Bender & Pieters, Training & Consultancy in Rehabilitation Sexology, Woerden.

3. "An ounce of prevention is worth a pound of cure; sexual forming for youngsters with disabilities": Youngsters with physical disabilities often experience a disturbance in their social-sexual development. Need for medical attention, dependence on caregivers and little privacy influences the way they develop in relation to their (sexual) body and their (sexual) autonomy. These youngsters often have difficulties integrating intimate relations in their lives and are especially vulnerable for sexual abuse and other negative aspects of sexuality. Key word is 'awareness about sexual health issues' among children and adolescents with disabilities as well as their parents, teachers and caregivers. - Ans Mellink, Social Worker MSW, Sexual health consultant - Merem Rehabilitation, Hilversum. As a member of MDT she works with children, adolescents and adults, as contextual therapist also works with families and couples.

E3. Mini-symposium: Value Based Health Care in Rehabilitation: From Hype to Reality

The principles of Value Based Health Care (VBHC) are increasingly adopted in health care, including medical specialist rehabilitation. Its main concept concerns the improvement of the value for the patient of the health care delivered. This not only requires the redesign of health care processes, e.g. by means of patient-centred care pathways and structural involvement of the patient in decision making. It also implies the appropriate measurement of outcomes in such a way that the value for the patient can indeed by demonstrated. Regarding the measurement of the value of rehabilitation for the patient, comprehensive sets of recommended outcomes are being developed or launched on both the national and international level. However, experiences with extensive outcome measurements based on the principles of VBHC from rehabilitation practice are very much needed, in order to further develop this field.

Participants in this mini-symposium:

- Are familiar with the principles of VBHC and its application in rehabilitation medicine
- Are aware of activities of the International Consortium for Health Outcomes Measurement (ICHOM) and parallel national and international initiatives regarding outcome assessment within the field of rehabilitation medicine
- Can apply the principles of shared decision making in stroke rehabilitation
- Have insight into potential success and failure factors of measuring the outcomes of stroke rehabilitation based on the VBHC principles

Chair: Paulien Goossens

Speakers: Felici van Vree, Thea Vliet Vlieland, Markus Wijffels, Helene Voogdt, Iris Groeneveld, Marieke de Jonge

Programme

1. General introduction - Paulien Goossens, physiatrist MD PhD, Rijnlands Rehabilitation Center, Leiden, Netherlands
2. Value Based Health Care (VBHC) in Rehabilitation - Prof. Thea Vliet Vlieland MD PhD - Professor of rehabilitation processes and physical therapy at the Department of Orthopaedics, Rehabilitation and Physical Therapy of the LUMC
3. The challenge of VBHC and bundle payment for ischaemic stroke in Rotterdam Stroke Service. Did we succeed? – Markus Wijffels, physiatrist MD, Rijndam Rehabilitation center, Rotterdam, Netherlands
4. Patient-centred rehabilitation: Shared decision making in stroke rehabilitation - Helene Voogdt, PhD, MSc, projectleader Shared decision making in stroke rehabilitation, Dutch Knowledge Network Stroke services, Utrecht, Netherlands

5. VBHC: From theory to practice! - Felicie van Vree MSc MA researcher / Marieke de Jonge, quality consultant, Rijnlands Rehabilitation Center, Leiden, Netherlands/ Iris Groeneveld PhD, researcher, Sophia rehabilitation Center, Den Haag, Netherlands
6. Plenary discussion

E4. Mini-symposium: Measuring cognitive functioning in rehabilitation: brief screening and outcome measurement

This mini-symposium will highlight the use of brief screening and outcome measures in medical rehabilitation, in particular the Montreal Cognitive Assessment (MoCa; a test to measure objective cognitive functioning), the Checklist of Cognitive and Emotional complaints (CLCE-24) (a questionnaire to measure subjective cognitive functioning) and the cognition scale of the Utrecht Scale for Evaluation of Rehabilitation (USER-cognition; an observational instrument). Measurement of cognitive dysfunction is well-developed and many validated tests for specific cognitive functions are available and commonly used for diagnostic purposes. Less evidence exists on the use of brief screening measures such as MoCA and the CLCE-24 for use in research and clinical practice. Measurement of cognition outcomes of rehabilitation is even less developed. The physical independence score of the USER is commonly used to measure outcomes of stroke rehabilitation in the Netherlands, but the USER-cognition score is not used and its validity is largely unclear to date. Based on results from recent cohort studies, clinical trials, routine outcome measurement, and clinical experience, the speakers will discuss the possibilities and limitations of these measures.

Chair: Marcel Post

Speakers: Marcel Post, Coen van Bennekom, Caroline van Heugten

Programme

1. Introduction to the workshop - prof. Marcel Post, PhD, professor of spinal cord injury rehabilitation, Center of Excellence for Rehabilitation Medicine Utrecht, Netherlands
2. Cognitive functioning based on the MoCA and CLCE-24 in brain injury research - Prof. Caroline van Heugten PhD, professor of clinical neuropsychology, Maastricht University Medical Center, Maastricht, Netherlands
3. The USER-cognition as outcome measure of rehabilitation - Marcel Post
4. Validity of cognitive screening measures in research and clinical practice - Prof. Coen van Bennekom, MD, PhD, professor of rehabilitation and labour, Heliomare Rehabilitation Center, Wijk aan Zee, Netherlands
5. General discussion

E5. Mini-symposium: The application of sensors to objectively monitor orthopaedic footwear adherence in research and clinical practice

For orthopaedic footwear to be effective, it is essential that patients adhere to wearing them. After decades of subjective monitoring of footwear adherence, new technology has found its way to research and clinical practice. Sensors based on recording temperature are available that can be placed in the footwear, for accurate and objective adherence measurements. During this symposium, the latest research insights obtained from using these sensors will be presented from clinical trials at AMC and UMCG. Presentations from the AMC focus on people with diabetes at high-risk for foot ulceration, for whom adherence is essential to prevent ulcers. This includes not only insight in their adherence patterns,

but also interventions to improve adherence via motivational interviewing and the provision of "orthopedic-home-shoes". The UMCG coordinates the SOFA-trial, in which more than 250 patients have already been included, with an adherence sensor placed in their first pair of orthopedic shoes. This sensor will register adherence continuously for 12 months, providing unique insights into long-term adherence patterns and potential seasonal changes. Finally, several orthopaedic shoe companies use these sensors in daily clinical practice. The last presentation of this symposium will focus on the challenges and benefits when implementing these sensors in footwear practice.

Chair: Jaap van Netten en Klaas Postema

Speakers: Jaap van Netten, Sicco Bus, Juha Hijmans, Tessa Busch-Westbroek, Thijs Lutjeboer, Rob Verwaard

Programme

1. Introduction - Jaap van Netten PhD, Department of Rehabilitation, Academic Medical Center, University of Amsterdam, Amsterdam Movement Sciences, Amsterdam, the Netherlands
2. The first steps – development of the @monitor and insights in adherence patterns of diabetes patients at high-risk of foot ulceration - Sicco Bus, AMC Amsterdam
3. The next step – validation of the Orthotimer and its application in the SOFA trial - Juha Hijmans, UMCG Groningen
4. The longest step – results of 12 months continuous monitoring of orthopedic footwear - Thijs Lutjeboer, UMCG Groningen
5. The adherent step – increasing orthopedic footwear adherence in people with diabetes via objective monitoring, motivational interviewing and "orthopaedic-home-shoes" - Tessa Busch-Westbroek, AMC Amsterdam
6. The real-life steps – implementing adherence sensors in clinical practice - Rob Verwaard, Wittepoel. Rotterdam
7. General discussion with the audience and closing remarks - Klaas Postema MD PhD, Department of Rehabilitation Medicine, University Medical Center Groningen, Groningen, the Netherlands

E6. Mini-symposium: Rehabilitation, Sport & Active Lifestyle: now and in the future

During the last two decades much has changed in rehabilitation practice. Rehabilitation and human movement sciences have bridged many gaps between theory and a more evidence-based practice. Gait labs, instrumented treadmills, robotics and exercise testing facilities have taken a place in rehabilitation institutes and have in many ways become elementary to institutional rehabilitation. The importance of exercise physiology and it's notions of testing, (de-)conditioning, physical activity, sedentariness, stress-strain-capacity and economy/efficiency of human mobility has evolved into daily rehab practice and the rehabilitation paradigm, and is viewed being essential ingredients for an active and participating individual after rehabilitation. Apart from exercise testing becoming an integral part of patient monitoring, patient-specific training and training guidelines have consequently evolved. With the worldwide outreach of 'Exercise=medicine', the stimulation of a physically active lifestyle within and beyond the doors of the rehabilitation centers has become key: to daily functioning, participation, health and well-being over the lifespan. Yet, are we doing a sufficiently decent job, what should and can be done better in a future of shorter clinical rehabilitation and more distant rehabilitation programs? How do persons with a disability pick up this challenge, which professional skills are required, where and when, what motivational elements can be laid out, what limiting factors play a role, what is the role of self-management, social economic status, a personal orientation towards sports and active lifestyle? How can we combine this with more personalized programs and advanced technologies? Many questions lay ahead, some can be answered now, but a future collaborative research agenda needs to evolve to help tackle this multifaceted challenge.

Chair: Lucas van der Woude

Speakers: Lucas van der Woude, Rienk Dekker, Trynke Hoekstra, Femke Hoekstra, Bregje Seves, Floor Hettinga, Leonie Krops

Programme

1. Rehabilitation, Sport & Active Lifestyle: now and in the future - Prof Lucas van der Woude PhD, Rienk Dekker MD PhD Center for Rehabilitation, UMCG, University of Groningen
2. ReSpAct, a prospective cohort study in and beyond Dutch Rehabilitation - Trynke Hoekstra PhD Health Sciences, VU University, Amsterdam / Femke Hoekstra PhD - University of British Columbia, Canada
3. Fatigue and physical activity behavior in stroke patients - Bregje Seves MSc, Center for Human Movement Sciences, UMCG, University of Groningen
4. Is 'learning to pace' the linking pin in an active lifestyle after rehab? - Floor Hettinga PhD - University of Essex, UK
5. Stimulating physical activity in hard-to-reach physically disabled people - Leonie Krops PhD, Center for Rehabilitation, UMCG, University of Groningen
6. General discussion

E7. Workshop: Patient Participation in Research: Challenges and Opportunities

We believe that research should not be 'about' or 'for' patients, it must be 'with' patients. Engaging patients and families in all stages of research, from ideas and research questions to implementation, increases relevance and impact of projects. Interest in patient involvement in research has been growing in recent years. However, patients' active participation in research is not self-evident. Special efforts are necessary to enable partnerships in research and to make it work. In several research projects we have used various ways to engage patients and parents. In this journey we found that true participation may be different for individual patients/parents, and may be different in various stages of a project. Discussing preferences and expectations highly supports patient engagement. We therefore developed the 'Participation Matrix', a tool aiming to promote and facilitate collaboration of patients and researchers. In this workshop we will present and discuss examples, experiences and tools supporting active involvement of patients and families in research.

Objectives of this workshop:
1) raising awareness why patient engagement in research is important
2) demonstrating examples of ways of making patient engagement happen
3) introducing the participation matrix, a tool to guide patient engagement

Chair: Marjolein Ketelaar
Speakers: Marjolijn Ketelaar, Martijn Klem, Dirk-Wouter Smits, Jan Willem Gorter, Mattijs Alsem

Programme

1. Introduction and background – Marjolijn Ketelaar, senior researcher, Center of Excellence for Rehabilitation Medicine Utrecht; De Hoogstraat Rehabilitation and UMC Utrecht
2. From subject to partner and back: shifting roles in patient participation – Martijn Klem, director BOSK
3. About various roles in research: the Participation Matrix as a tool to enable engagement – Dirk-Wouter Smits, post-doc researcher, Center of Excellence for Rehabilitation Medicine Utrecht
4. The use of social media in engaging families in research - Jan Willem Gorter, director of CanChild, McMaster University, Hamilton, Canada
5. Experiences and examples of active involvement by parents in a research project – Mattijs Alsem, rehabilitation physiatrist, AMC
6. Interactive discussion: Active engagement of patients and parents in research: Next steps!

E8. Workshop: PROFITS: opportunities to improve prediction and services early post stroke

There is a dire need for transparent, predictable referral policies and adequate follow-up of stroke rehabilitation services to improve quality of care based on evidence based and individually tailored rehabilitation plans (Langhorne et al, 2011). The PROFITS project (Precision profiling to improve long-term outcome after stroke) develops and implements a standardized initial and follow- up assessment of motor recovery post stroke in terms of behavioral restitution (primary neurological repair) and compensation strategies in line with the recommendations of the international stroke recovery and rehabilitation research group (SRRR, Bernhardt et al, 2017; Kwakkel et al, 2017). PROFITS serves both a clinical goal i.e. building a clinimetric backbone- clinical infrastructure for standardized evaluation of referral policies and interventions early after stroke as well as research purposes, i.e. optimization of prediction models and fundamental understanding of motor recovery. A key feature of PROFITS is its clinimetric core set based on current guidelines (KNGF) in which education and training of proper assessment is considered crucial for obtaining reliable and valid outcome. A second feature is the possibility of multicenter data- aggregation by using a tailor- made web-based data-entry, storage facility and computerized prognosis (GEMSTRACKER- Pulse). This workshop discusses the clinical potential of aforementioned approach.

Chair: Gert Kwakkel & Carel Meskers

Speakers: Carel Meskers, Gert Kwakkel, Aukje Andringa, Ruud Selles

Programma

1. The base: understanding neurobiological and functional recovery post stroke - Prof. Gert Kwakkel PhD, Chair Neurorehabilitation, VU University Medical Center, Amsterdam, The Netherlands
2. Clinical consequences & implementation - Carel Meskers MD PhD, Rehabilitation Physician, Associate Professor, VU University Medical Center, Amsterdam, The Netherlands
3. How to implement a clinimetric core-set - Aukje Andringa, Physiotherapist, PhD student, VU University Medical Center, Amsterdam, The Netherlands
4. ICT infrastructure: design, implementation and perspectives - Ruud Selles PhD, Associate Professor, Erasmus Medical Center, Rotterdam, The Netherlands
5. How to move forward: bringing early rehabilitation post stroke to a higher level - Gert Kwakkel & Carel Meskers

Posters – index

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

1. Outcomes of amputation because of long-standing therapy-resistant complex regional pain syndrome type I

J. Scheper, E. Schrier, P.U. Dijkstra, J.H.B. Geertzen
University Medical Centre Groningen, GRONINGEN, The Netherlands

Introduction: Amputation as treatment for long-standing therapy-resistant complex regional pain syndrome type I (CRPS-I) is controversial. **Objective:** To evaluate long-term outcomes of amputation in patients with long-standing therapy-resistant CRPS-I regarding quality of life, pain, recurrence of CRPS-I, use of a prosthesis and functioning in daily life. **Patients:** From May 2000 to September 2015, 53 patients underwent amputation of a limb affected by long-standing therapy-resistant CRPS-I at our institution. Forty-eight patients (40 women) were included in this study. **Methods:** Participants completed 5 questionnaires, a semi-structured interview was conducted and, if indicated, a physical examination was performed. For a subgroup (n=17) a longitudinal follow-up was performed, based on data available from a previous study. **Results:** Thirty-seven participants (77%) reported an important improvement in mobility after amputation. An important reduction of pain was reported by 35 participants (73%) after amputation. Important deteriorations were reported by 20 participants (42%; ranging from 1 to 11 important deteriorations per participant). Recurrence of CRPS-I occurred in the residual or another limb of 4 participants (9%, n=47). Longitudinal follow-up of a subgroup (n=17) showed no significant deteriorations. **Discussion and conclusions:** Amputation because of long-standing therapy-resistant CRPS-I may lead to positive changes in patients' lives. Most improvement was reported for mobility and pain. However, deterioration is also reported and recurrence of CRPS-I may occur. **Clinical message:** For patients with long-standing therapy-resistant CRPS-I amputation should be considered as a treatment. Extensive screening prior to (possible) amputation is essential to assess if the patients' expectations and goals post amputation are realistic.

J. Scheper- j.scheper@umcg.nl

2. Usability of non-contact scanners in measuring residual limb volume in trans-tibial (TT) amputee patients

R. Kofman[1], R.E. Winter[2], C.H. Emmelot[3], J.H.B. Geertzen[4], P.U. Dijkstra[4]
[1]Vogellanden Rehabilitationcentre, ZWOLLE, The Netherlands
[2]Vogellanden Rehabilitationcentre / Isala Hospital, ZWOLLE, The Netherlands
[3]Isala Hospital, ZWOLLE, The Netherlands
[4]University of Groningen / University Medical Centre, GRONINGEN, The Netherlands

Introduction: In the past non-contact scanners have been tested for reliability to measure residual limb volume for research purposes in TT amputee patients. However new scanners are available on the market nowadays. **Objective:** To determine the reliability and clinical usability of non-contact scanners in measuring residual limb volume in TT amputee patients. **Patients:** Uni- or bilateral TT amputee patients older than 18 years, without any co-morbidity that potentially influences residual limb volume. **Methods:** Three non-contact scanners (Rodin4D, Omega Tracer, Biosculptor) were used to measure residual limb volume on two occasions by two observers. Time to take the measurement, patient satisfaction (0-10 scale) and Post-Study System Usability Questionnaire (PSSUQ) were determined for each measurement. **Results:** The error variance was 8.4%, where patient and measurement system explained most of the error variance (80.7%). Repeatability coefficients of the systems were 16.5 cc (Omega Tracer), 26.4 cc (Rodin4D), 32.8 cc (Biosculptor). The usability of the Biosculptor was significant poorer compared to the other two systems. Time to perform the measurements was significantly shorter (80 sec) for the Omega Tracer compared to the other systems. Time for measurements reduced on the second occasion (46 sec). Median satisfaction score for each system was 10. **Discussion and conclusions:** Time to perform the measurements with the Omega Tracer was 80 seconds longer. The Omega Tracer is the most reliable and clinical usable non-contact scanner. **Clinical message:** Omega Tracer is the most reliable and clinical usable non-contact scanner to measure the residual limb volume in TT amputee patients.

R. Kofman- riannekofman@gmail.com

4. Conventional versus 3D-printed hand splints: a pilot study to compare the patient's satisfaction.

Y.L. Kerkum[1], P.R.M. de Groot[1], H.J. Gijsbers[2], T.A.M. Oud[2]
[1]OIM Orthopedie, ASSEN, The Netherlands
[2]Academic Medical Center, AMSTERDAM, The Netherlands

Patients with hand injuries are commonly prescribed with splints to stabilize or support the wrist, hand and/or fingers[1]. Patient satisfaction is however often sub-optimal, resulting in reduced therapy compliance[2]. 3D-printed splints are expected to provide benefits for the patient, e.g. more comfort, but scientific evidence of these potential benefits is lacking. The aim of this ongoing pilot-study was to compare satisfaction of conventional splints to 3D-printed splints (3Dsplints).
Ten patients will be included in this study. So far, five patients diagnosed with various hand injuries were prescribed with both splints. The orthopaedic technician manufactured a conventional splint, based on a plaster model. Based on a 3D-scan (HCP30, Creaform, Canada), the 3Dsplint was modelled (Njoy Braces, The Netherlands) and printed (Hulotech, The Netherlands). Patients used both splints in randomized order for at least one week. All patients completed an online questionnaire, defining different user aspects on a 5-point scale.
To date, three patients returned the questionnaire. Patients generally experienced better functionality and comfort by using the 3Dsplint. Yet, two patients preferred casting above scanning and experienced more transpiration using the 3Dsplint. All patients preferred the 3Dsplint for future use.
Although we could only evaluate both splints in three patients, patients experience several benefits of the 3Dsplint. More research should be done to expand the possibilities of this technique. Furthermore, the process of 3D-scanning should be improved. As our first experience is promising, we expect to frequently prescribe 3Dsplints in near future.

[1]Roll SC & Hardison ME,Am.J.Occup.Ther.(2017);
[2]Veehof MM et al.,Arthritis Rheum.(2008)

Picture 1: https://www.eventure-online.com/parthen-uploads/89/8DCRM/add_1_458418_c13cf4cb-b37b-43a7-8ecc-0b794241b495.png
Caption 1: Figure 1. 3D render of one of the splints, based on a 3D-scan of the patient's hand and forearm.

Y.L. Kerkum- y.kerkum@oim.nl

5. Is PROMIS promising in rehabilitation? A pilot study in regular care

F.M. van Vree[1,2], G. Volker [1], A.J. de Kloet [2,4], I.F. Groeneveld [1,2], J.J.L. Meesters [2,3,4], T.P.M. Vliet Vlieland [1,2,3], P.H. Goossens [1,3]
[1]Rijnlands Rehabilitation Center, LEIDEN, The Netherlands
[2]Sophia Rehabilitation, THE HAGUE, The Netherlands
[3]Leiden University Medical Center, LEIDEN, The Netherlands
[4]The Hague University of Applied Sciences, THE HAGUE, The Netherlands

Introduction: Patient-Reported Outcomes Measurement Information System (PROMIS) seems a promising suitable tool to contribute to value based health care in rehabilitation. **Objective:** To examine the feasibility of PROMIS in patients with various diagnoses in an outpatient rehabilitation setting. **Patients:** Between April 2017 and February 2018 patients were invited by email at start of outpatient rehabilitation in the Rijnlands Rehabilitation Centre. **Methods:** Electronic PROMIS short forms were collected, including the PROMIS Ability to Participate in Social roles and activities (PROMIS-APS) and PROMIS Satisfaction with Participation in Social roles (PROMIS-SPS). T-scores calculated range from 0 to 100 (average USpopulation = 50) Mean PROMIS-APS and SPS t-scores and SD were calculated and compared between diagnosis, age groups and gender using T-tests, One-Way Anova and multivariable regression analysis. **Results:** Of the 749 patients 376 completed the PROMIS-APS and SPS scales: 183 diagnosed with acquired brain injury (mean PROMIS-APS 43,2; PROMIS-SPS41,1), 59 neuromuscular disease (42,7 ;42,1), 55 spinal and nerve injury (42,0;41,7), 29 musculoskeletal disease (41,3;39,9), 23 lung/heart/cancer (46,3;42,2), 19 chronic pain (41,4;41,5) and 9 amputation (46,4;39,9). Mean (+SD) PROMIS-APS t-score

was 43,0(+7,2) and PROMIS-SPS 41,3(+7,5). Age and sex were significantly associated with PROMIS-APS and sex with PROMIS-SPS t-scores. **Discussion and conclusion:** 50% of patients successfully completed online PROMIS short forms. The PROMIS-APS and PROMIS-SPS t-scores were significantly lower in all diagnosis groups compared to the USpopulation. The ability of the PROMIS-APS and PROMS-SPS to detect changes over time needs to be established. **Clinical message;** PROMIS seems a feasible instrument in an outpatient rehabilitation setting.

F.M. van Vree- fvv@rrc.nl

6. Attention needed for cognitive problems in patients after out-of-hospital cardiac arrest: an internet based survey about daily rehabilitation care

L.W. Boyce[1], P.H. Goossens[1,2], G. Volker[1], H.J. van Exel[1,3], T.P.M. Vliet Vlieland[1,2], L. van Bodegom-Vos[4]
[1]Rijnlands Rehabilitation Centre, LEIDEN, the Netherlands
[2]Department of Orthopaedics, Rehabilitation and Physical Therapy, Leiden University Medical Center, LEIDEN, the Netherlands
[3]Department of Cardiology, Leiden University Medical Center, LEIDEN, the Netherlands
[4]Department of Biomedical Data Sciences, section Medical Decision Making, Leiden University Medical Center, LEIDEN, the Netherlands

Introduction: Literature and guidelines for out-of-hospital cardiac arrest (OHCA) patients recommend screening for cognitive impairments and referral to cognitive rehabilitation. **Objective:** This study assessed the uptake of recommendations to screen for cognitive impairments in OHCA survivors. **Subjects:** Cardiologists and rehabilitation specialists involved in rehabilitation of OHCA patients in the Netherlands. **Methods:** An internet-based questionnaire sent to 74 cardiologists and 143 rehabilitation specialists. The questionnaire covered: background characteristics, availability and content of cognitive screening and rehabilitation, organisation of care, experienced need for an integrated care pathway including physical and cognitive rehabilitation, barriers and facilitators for an integrated care pathway. **Results:** Forty-five questionnaires were returned (16 cardiologists and 29 rehabilitation specialists). Of the respondents 39% prescribed cognitive screening and 89% underscored the importance of an integrated care pathway (physical and cognitive rehabilitation). Barriers for a care pathway included lack of knowledge, logistic obstacles and poor cooperation between departments. Facilitators were seen in existing co-operations, added value of care pathway, alignment of cardiac/cognitive rehabilitation, focus on patients needs, less chance of relapse and drop-outs during rehabilitation. **Discussion/conclusions:** Although the majority of the responding cardiologists and rehabilitation specialists underscores the value of a cognitive screening in OHCA patients, only a minority routinely prescribe some form of cognitive screening. The wish for a care pathway is endorsed by specialists. The uptake of such a care pathway seems hindered by lack of knowledge and organisational barriers. **Clinical message:** Structural assessment of cognitive impairments of OHCA survivors need to be made through care pathways.

L.W. Boyce- lww@rrc.nl

7. Motor function as predictor of inpatient length of stay and discharge destination in stroke rehabilitation

M.P.C. Tazelaar[1], M.M. Eckhardt[1], I. Ploeg[1], M.H. Heijenbrok-Kal[2], G.M. Ribbers[1]
[1]Rijndam Rehabilitation, ROTTERDAM, The Netherlands
[2]Erasmus MC, ROTTERDAM, The Netherlands

Introduction: Prediction of length of stay (LOS) and discharge destination (home versus nursing facility) in inpatient stroke rehabilitation is important for setting attainable treatment goals, discharge planning, informing patients and caregivers, and lowering costs. **Objective:** To examine whether motor function, measured by Berg Balance Scale (BBS), Functional Ambulation Category Scale (FAC), and Brunnstrom Fugl-Meyer assessment (BFM) on admission, is predictive for LOS and discharge destination in stroke rehabilitation adjusted for patient and stroke-specific factors. **Patients and Methods:** Univariable and multivariable linear and logistic regression analyses were performed on data prospectively collected between July 2011 and January 2016 from 715 adult patients (mean age 59 (SD=10.9) years, 59.4% men) within 21 days

post stroke, to assess the predictive value of motor function on LOS and discharge destination respectively. **Results:** Mean LOS was 56.5 (SD=36.9) days and 666 (94.2%) patients were discharged home. BBS, BFM, and FAC were independently predictive for LOS, adjusted for interim hospitalisation, living situation, cognition, current smoking, and days post stroke (R^2=0.42). Interim hospitalisation (OR=5.0; p<.001), and smoking (OR=2.0; p<.05) showed the highest predictive value for being discharged to a nursing facility. **Discussion and Conclusions:** We found motor function, predominantly BBS, to be predictive for inpatient LOS, but not for discharge destination, in stroke rehabilitation. In contrast, stroke-specific factors did not influence any of these outcomes. **Clinical Message:** Early assessment of motor function, especially balance, at admission is important for discharge planning in inpatient stroke rehabilitation.

M.P.C. Tazelaar- martje.tazelaar@gmail.com

8. Evaluation of the Digital O-Cancellation as a Diagnostic Tool for Visuospatial Neglect in Stroke Patients.

I.K. Gosselt, L.A. Spreij, T.C.W. Nijboer, J.M.A. Visser-Meily
Center of Excellence for Rehabilitation Medicine, University Medical Center, UTRECHT, The Netherlands

Introduction: Patients with mild and/or well-compensated neglect are often not detected with paper-and-pencil cancellation tasks. These patients, however, do experience problems in daily life. There is an urgent need for more sensitive neuropsychological measures. **Objective:** In this study, we examined the feasibility and diagnostic accuracy of the digital O-cancellation in relation to the Star Cancellation Task (SCT) and the Catherine Bergego Scale (CBS). Patients: Stroke inpatients at De Hoogstraat Rehabilitation Center in Utrecht, the Netherlands. **Methods:** The SCT, CBS and the O-cancellation were administered. A semi-structured interview was conducted regarding the experience with the digital O-cancellation. **Results:** In total, 13 neglect patients, 25 non-neglect patients and 20 healthy controls were included. All participants were able to complete the digital O-cancellation. The sensitivity was 30.8% and the specificity was 88% (with the SCT and CBS as golden standard). The positive predictive value was 57.1% and the negative predictive value was 71%. Regarding non-neglect patients, 12% did show neglect on the O-cancellation and not on the SCT or CBS. **Discussion and conclusions:** Digitizing the O-cancellation can be considered as feasible. The O-cancellation is of added value in the current assessment of neglect, as an extra 12% of neglect patients were detected. However, the diagnosis of neglect should always be based on several tasks, since differences in performance exist between various cancellation tasks. **Clinical message:** More sensitive tasks are needed in order to detect mild and/or well-compensated signs of neglect in stroke patients.

I.K. Gosselt- i.k.gosselt@umcutrecht.nl

9. The influence of psychological factors and emotional functioning on the course of participation up to four years after stroke

J.A. de Graaf[1], V.P.M. Schepers[2], B. Nijsse[3], M.W.M. Post[4], J.M.A. Visser-Meily[2]
[1]UMC Utrecht / De Hoogstraat, UTRECHT, The Netherlands
[2]UMC Utrecht, UTRECHT, The Netherlands
[3]Elisabeth-Tweesteden Hospital, TILBURG, The Netherlands
[4]De Hoogstraat, UTRECHT, The Netherlands

Introduction: Due to major improvements in the acute treatment of stroke the number of stroke patients that have to cope with long-term restrictions in their participation is increasing. However, the long-term course of participation and its determinants remain largely unknown yet. **Objective:** [1] To explore the course of participation from two months up to four years after stroke, and [2] to examine if adaptive and maladaptive psychological factors and mood problems measured two months after stroke are determinants of the course of participation during this period. **Patients:** This study is an extension of the multicentre prospective longitudinal Restore4Stroke Cohort study and used data from 369 stroke survivors collected at stroke onset, two months, six months, one year, two years and four years after stroke. **Methods:** The Utrecht Scale for Evaluation of Rehabilitation-Participation restrictions subscale was used to measure participation. Psychological

factors were clustered into adaptive and maladaptive psychological factors. Linear mixed models were used. **Results:** Restrictions in all domains of participation were still considerable four years after stroke. The presence of mood problems and a less adaptive psychological scale were independent predictors associated with more restrictions in the course of participation. **Conclusions:** In addition to mood problems, adaptive psychological factors are important predictors of the course of restrictions in participation up to four years after stroke. **Clinical message:** Screening on mood problems and adaptive psychological factors in the subacute phase after stroke can give clinicians important prognostic information about the course of participation up to four years after stroke.

J.A. De Graaf – joris.degraaf@gmail.com

10. Predicting recovery of neglect: a qualitative study

E.J. van Overbeeke, A.F. ten Brink, J.M.A. Visser-Meily, T.C.W. Nijboer
Center of Excellence in Rehabilitation Medicine, Brain Center Rudolf Magnus, UTRECHT, The Netherlands

Introduction: Patients with neglect tend to ignore contralesional information, or process this information much slower. Neglect has negative impact on rehabilitation, as it supresses recovery in other domains as well (e.g. motor impairment). Eventually, patients with neglect are less independent in daily live activities compared to patients without neglect. It is unknown which factors affect recovery. **Objective:** Our aim was to describe which factors relate to neglect recovery. **Methods:** We evaluated data of a randomized controlled trial ("Prism Adaptation in Rehabiliation"), in which 69 patients with neglect were examined and followed for 6 weeks. Neglect was assessed with a shape cancellation test and the Catherine Bergego Scale, an observation scale for neglect during activities of daily living. We divided patients in groups with mild, moderate and severe neglect at baseline and after 6 weeks. We used descriptive statistics to evaluate baseline characteristics between patients with different recovery patterns. **Results:** Patients with more severe neglect at baseline had more often right-sided brain damage, lower functional independence and a lower level of education. Patients with higher functional independence, less severe paresis and less severe neglect at baseline showed most recovery 6 weeks later. **Discussion and conclusions:** This exploratory study shows that small differences exist between patients with different recovery patterns. However, larger studies are needed to confirm results. **Clinical message:** Neglect is a frequent consequence of a stroke with disabling outcome. Patients with more severe neglect and lower functional independence and mobility at baseline, tend to show least recovery from neglect.

E.J. van Overbeeke- l.v.overbeeke@dehoogstraat.nl

11. Position-cortical coherence as a marker for somatosensory integrity early post stroke

-

S.B. Zandvliet- s.zandvliet@vumc.nl

12. Does Transcranial Magnetic Stimulation have an added value to clinical assessment in predicting upper limb function very early after severe stroke?

M. Hoonhorst[1], G. Kwakkel[2], R.H.M. Nijland[2], B.J. Kollen[3], C.H. Emmelot[4]

[1]Rehabilitation centre Vogellanden, ZWOLLE, The Netherlands
[2]Amsterdam Rehabilitation Research Center | Reade, AMSTERDAM, The Netherlands
[3]University Medical Center Groningen, GRONINGEN, The Netherlands
[4]Isala Clinic, ZWOLLE, The Netherlands

Background: The added prognostic value of Transcranial Magnetic Stimulation (TMS) induced Motor Evoked Potentials (MEPs) above clinical modelling for the upper limb is still unknown early post-stroke.

Objective: To determine the added prognostic value of TMS of the Adductor Digiti Minimi (TMS-ADM) to the clinical model based on voluntary Shoulder Abduction (SA) and Finger Extension (FE) within the first 48 hours and at 11 days after stroke. **Methods:**prospective cohort study with three logistic regression models, developed topredict upper limb function at 6 months post-stroke. The first model showed the predictive value of SA and FE measured within 48 hours and at 11 days post-stroke. The second model included TMS-ADM, while the third model combined clinical and TMS-ADM information. Differences between derived models were tested with ROC-analyses. **Results:**51 patients with severe first-ever, ischemic stroke were included. Within 48 hours, no significant added value of TMS-ADM to clinical modelling was found (p=0.369). Both models suffered from a relatively low negative predicted value within 48 hours post-stroke. TMS-ADM combined with SAFE showed significantly more accuracy than TMS-ADM alone at 11 days post-stroke (p=0.039). **Conclusion:**TMS-ADM showed no added value above clinical modelling when measured within the first 48 hours post-stroke, whereas optimal prediction is achieved by SAFE combined with TMS-ADM at 11 days post-stroke. Our findings suggest that accuracy of predicting upper limb motor function by TMS-ADM is mainly determined by the moment of assessment early after stroke onset.

M. Hoonhorst- m.hoonhorst@vogellanden.nl

13. Novel inventory for cognitive complaints after acquired brain injury

L.A. Spreij, T.C.W. Nijboer, J.M.A. Visser-Meily, D. Sluiter
University Medical Center Utrecht and De Hoogstraat Rehabilitation, UTRECHT, The Netherlands

Introduction: Currently, there is no inventory that measures cognitive complaints in daily life in patients with acquired brain injury (ABI). **Objective:** We developed an inventory to measure cognitive complaints (across the memory, attention, executive domain) and the required amount of help and effort (range 0-4) during daily life situations (e.g. housekeeping, work). We investigate the feasibility and prevalence of cognitive complaints in patients with ABI compared to healthy participants. **Patients:** We recruited outpatients (n=21) from the University Medical Center Utrecht, the Netherlands. **Methods:** The inventory was created based on the results of a review of available literature, expert meetings with clinicians and cognitive neuroscientists, and interviews with patients. Patients and healthy participants (n=71) filled in the inventory. **Results:** All participants were able to complete the inventory. Preliminary results show that patients require more effort and help during all queried activities, especially within family life (M=2.60, SD=.86) compared to healthy participants (M=1.09, SD=.20). Also, patients reported more complaints in attention (M=2.41, SD=.74) followed by memory (M=2.17, SD=.64) and executive function (M=1.97, SD=.59) compared to healthy participants (attention (M=1.08, SD=.11); memory (M=1.17, SD=.21); executive function (M=1.03, SD=.07). **Discussion & Conclusions:** The inventory is developed as a supportive inventory during a neuropsychological assessment. The next step will be to relate the complaints measured with the inventory to the results of a neuropsychological assessment. **Clinical Message:** An inventory is needed to measure the cognitive complaints, especially considering that there is often a discrepancy between daily life complaints and the results on a neuropsychological assessment.

L. A. Spreij- l.a.spreij-3@umcutrecht.nl

14. No Added Value of Prism Adaptation on Visuospatial Neglect in the Subacute Phase after Stroke: a Bayesian Approach

L.A. Spreij[1], T.C.W. Nijboer[1], J.M.A. Visser-Meily[1], A.F. Ten Brink[1], M.J. Schut[2]
[1]University Medical Center Utrecht and De Hoogstraat Rehabilitation, UTRECHT, The Netherlands
[2]University Utrecht, UTRECHT, The Netherlands

Introduction: In the field of rehabilitation medicine, frequentist statistics including statistical hypothesis testing are mostly used to analyze data. A p-value, however, provides limited information, and should not be used when other statistical approaches are suitable. **Objective:** We use a Bayesian approach to investigate the effect of prism adaptation (PA), compared to sham adaptation (SA), on the rehabilitation of visuospatial neglect (VSN). Using a Bayesian approach, we can

attach probabilities to hypotheses and elaborate about the weight of the evidence supporting the null hypothesis. **Patients:** Stroke patients were recruited at De Hoogstraat Rehabilitation Center in Utrecht. **Methods:** Patients were randomized for either the PA or the SA treatment. The measurements were conducted at baseline and after 1, 2, 3, 4, 6, and 14 weeks from the start of treatment. Patients were tested with neuropsychological measures (shape cancellation, line bisection, letter cancellation), experimental measures (simulated driving, mobility assessment course, landmark task), and ADL measures (Catherine Bergego Scale, Barthel index, balance). We report Bayes Factors (BF) (1-3 no evidence; 3-20 positive evidence; 20-100 strong evidence). **Results:** Bayesian linear mixed models showed that the treatment group was not predictive for the results on the neuropsychological measures (BF=12-18), experimental measures (BF=10-13), and ADL measures (BF=4-9). Discussion & Conclusion. Based on this study, we can state with more certainty that there is no support for the effectiveness of PA on VSN measured with an extensive battery. **Clinical Message:** In contrast to previous literature, PA did not show a beneficial effect on the rehabilitation of VSN.

L. A. Spreij- l.a.spreij-3@umcutrecht.nl

15. Responsiveness of the Utrecht Scale for Evaluation of Rehabilitation (USER) in stroke

W. Pont[1], G. Volker[1], T. Vliet Vlieland[2], P.H. Goossens[1]
[1]Rijnlands Rehabilitation Centre, LEIDEN, The Netherlands
[2]Leiden University Medical Centre, LEIDEN, The Netherlands

Introduction: The Utrecht Scale for Evaluation of Rehabilitation (USER) is a generic nurse-reported and partly nurse-recorded outcome measure of clinical rehabilitation. Knowledge on its responsiveness in stroke patients is limited. **Objective:** The purpose of this observational study was to determine the responsiveness of the USER in stroke patients in an inpatient rehabilitation facility. **Patients:** Stroke patients admitted for clinical rehabilitation in one rehabilitation centre in 2014 or 2015. **Methods:** In all patients, the USER (subscales Mobility, Self-care, Cognitive functioning, Pain, Fatigue and Mood) and the Barthel Index (BI) were administered by a nurse at admission and discharge. The effect size (ES) and Standardized Response Mean (SRM) were calculated as a measure of responsiveness. **Results:** From 198 (78%) of the 254 patients who were included in the study period, data from both admission and discharge data were available. Of them 125 were men (63%), mean age (SD) 61.5 (11.8) years. The ES of the USER subscales Mobility, Self-care, Cognitive functioning, Pain, Fatigue and Mood were 0.93, 0.85, 0.50, 0.19, 0.40 and 0.27, respectively and of the BI 1.05. The results for the SRM were in the same range. **Discussion and conclusions:** In inpatient rehabilitation after stroke, the USER subscales Mobility and Self-care, showed the greatest sensitivity to change. Overall the USER was less responsive than the BI. **Clinical message:** In clinical practice, it could be considered to use either the BI or only the subscales Mobility and Self-care of the USER.

W. Pont- wpn@rrc.nl

16 . CommuniCare: an intervention aimed at improving communication between health care professionals, persons with aphasia and their proxies

M.N. van Rijssen
HU University of Applied Sciences, UTRECHT, The Netherlands

Introduction: Stroke changes the life of a person dramatically. Of all people who suffer a stroke, about a third is diagnosed with aphasia. Communication disorders can have serious consequences. Persons with aphasia (PWA) have higher risks for depression and for receiving inadequate care. **Objective:** Two pilot studies were conducted prior to the CommuniCare study and assessed the feasibility of training nurses to optimize their communication with PWA. **Patients:** Fourteen and forty-six nurses working on a Stroke Unit of a university hospital or peripheral hospital respectively were trained to support their communication with PWA. **Methods:** In line with the MRC-model for complex interventions, a mixed-methods feasibility study was conducted, including a pre-test post-test study in the quantitative part and three focus group discussions in the qualitative part. **Results:** Nurses reported that they find joint- decision making with patients very

important, but feel insufficiently skilled to make this happen with PWA. However, almost all nurses announced that the training sessions gave them more tools to support their communication (49/50). Nurses uniformly recognized that especially role-playing as a way to practice communication skills was very valuable. **Discussions and conclusions:** Two pilot studies provide promising results on the feasibility of increasing skills and knowledge of aphasia in nurses. **Clinical message:** The results of these two pilot studies have resulted in the application and approval of the CommuniCare study, which aims to develop and implement an intervention for improving communication between health care professionals, persons with aphasia and their proxies in various health care settings.

M.N. van Rijssen- maren.vanrijssen@hu.nl

17. Prospectively classifying community walkers after stroke: who are they?

M. Mulder[1], R.H.M. Nijland[2], I.G. van de Port[3], E.E.H. van Wegen[1], G. Kwakkel[1]
[1]VU University Medical Center, AMSTERDAM, The Netherlands
[2]Reade, AMSTERDAM, The Netherlands
[3]Revant, BREDA, The Netherlands

Introduction: Identifying stroke patients who will regain independent community ambulation after inpatient rehabilitation is paramount for efficient deployment of community services. **Objective:** To identify and characterize homogeneous subgroups at discharge from inpatient care and to predict community ambulation.
Patients: Cohort of 243 stroke patients, discharged to their own home. **Methods:** Classification And Regression Tree (CART) analysis was used to identify prognostic subgroups. Patient and stroke characteristics, motor factors and psychosocial factors were considered as potential classifiers at discharge from inpatient rehabilitation (i.e. 3 months post-stroke). Final outcome was determined 6 months later using the community ambulation questionnaire.
Results: A total of 193 stroke patients were classified as community walkers. The CART model accurately classified (97.5%) patients with a comfortable gait speed >0.8 m/s as community walkers. Patients with gait speeds ranging from 0.5 to 0.8 m/s were further classified according to time after stroke and presence of comorbidities. Patients with gait speeds <0.5 m were further classified according to premorbid physical activity level and presence of fatigue.
Discussion and conclusions: Comfortable gait speed is a key factor in regaining independence in outdoor walking. Community rehabilitation aimed at improving outdoor walking is advised in patients with comfortable gait speeds ≤0.8 m/s, while monitoring of gait-related problems may be sufficient in patients with gait speeds >0.8 m/s. Disabling comorbidities and premorbid physical activity level could aid in identifying patients who benefit from additional support such as transportation. **Clinical message:** The CART model can support clinicians in organizing community services and informing patients about what to expect after inpatient care.

M. Mulder- marijn.mulder@reade.nl

18. Changes in actual arm-hand use in stroke patients during and after clinical rehabilitation

A.Franck[1], J.E.M. Smeets[2], A.M. Seelen[1]
[1]Adelante Rehabilitation Centre, HOENSBROEK, The Netherlands
[2]Maastricht University, Research School CAPHRI, MAASTRICHT, The Netherlands

Abstract: Improvement of arm-hand function and arm-hand skill performance in stroke patients is reported by many authors. However, therapy content often is poorly described; data on actual arm-hand use are scarce, and follow-up time often is very short. Also, outcome data mainly stem from either a general patient group, not stratified for the level of arm-hand impairment severity, or a very specific patient group. **Objectives:** To what extent does the rate of improvement or deterioration (over time) of actual arm-hand use differ between stroke patients with either a severely, moderately or mildly affected arm-hand, during and after rehabilitation involving a well-defined rehabilitation program? **Patients:** Seventy-six patients (63 males); mean age:57.6yr (+/-10.6); post-stroke time:29.8 days (+/-20.1) participated. **Methods:** Design: single–

armed prospective cohort study. Outcome measure: affected arm-hand use during daily tasks (accelerometry), expressed as movement Intensity and Duration-of-arm-hand-use during waking hours. Measurement dates: at admission, clinical discharge and 3,6,9,12 months post-discharge. Statistics:2-way repeated measures ANOVAs. **Results:** Between baseline and 1-year follow-up, Intensity-of-arm-hand-use on the affected side increased by 51%, 114% and 14% (p<.000) in the mildly, moderately and severely affected patients respectively. Similarly, Duration-of-arm-hand-use increased 26%, 220% and 161% (p<.000). Regarding bimanual arm-hand use: Intensity-of-arm-hand-use increased 44%, 74% and 30% (p<.000), whereas Duration-of-arm-hand-use increased 10%, 22% and 16% (p<.000). **Conclusion:** Stroke survivors with a moderately or mildly affected arm-hand showed important improvements in actual arm-hand use during the rehabilitation phase. Intensity-of-use and Duration-of-use significantly improved in both unimanual and bimanual tasks/skills. These improvements were maintained until at least 1 year post-discharge.

Poster will be presented by W.G.M. Bakx and K. Renders

A. Franck- h.franck@adelante-zorggroep.nl

19. Responsiveness of the Michigan Hand Outcome Questionnaire in inpatient rehabilitation treatment after stroke

L. van Gelder[1], H.J. Arwert[1], I.F. Groeneveld[2], J.L. Meesters[1], T.P. Vliet-Vlieland[3]
[1]Sophia Rehabilitation Centre, THE HAGUE, The Netherlands
[2]Haaglanden Medical Center, THE HAGUE, The Netherlands
[3]Rijnlands Rehabilitation Center, LEIDEN, The Netherlands

Introduction: The Michigan Hand Outcomes Questionnaire (MHQ) was recently validated to assess hand functioning in stroke patients, its responsiveness to change is unknown. **Objective:** To investigate the responsiveness of MHQ in inpatient rehabilitation for stroke patients. **Patients:** Patients admitted to rehabilitation after a first ever stroke <6 months="" ago="" with="" upper-extremity="" impairments="" p=""> **Methods:** On admission-discharge patients were asked to complete the MHQ (total score, subscores activities/work/pain/aesthetics/satisfaction, range 0-100, worst-best) and the Stroke-Impact-Scale hand (SIS-hand, range, direction). Paired t-tests with 95% confidence intervals (95%CI) and Spearman correlations (rs) analysed the change scores of the MHQ and SIS-hand. Measures of responsiveness included the standardized response mean (SRM) and effect size (ES). **Results:** Forty-seven patients were included, mean age 59(12.6) follow up 48.7(25.8) days. The mean (95%CI) SIS-hand score improved significantly after treatment (46.85(36.7-57.1) vs 59.9(48.4-71.5)). The mean total MHQ-score did not improve between admission-discharge (68.3(63.4-73.1) vs 66.5(60.9-72.1)), although the subscales activities/aesthetics/satisfaction improved significantly. The subscales pain/work deteriorated significantly. There was a strong significant correlation between the change of SIS-hand and MHQ total (rs=0.737;p=0.00) The SRM and ES were both 0.80. **Discussion and conclusions:** Although patients improved on the SIS-hand, no change was seen in MHQ total score. Nevertheless improvements/deteriorations were seen in subscales on the MHQ and may disguise changes in total score. **Clinical message:**The total score of the MHQ is not applicable for measuring improvement of hand function in (sub)acute stroke patients with impairments of the upper limb. Further research into the applicability of the subscores is needed.

L. van Gelder- l.vangelder@sophiarevalidatie.nl

20. Peer support in neurorehabilitation for acquired brain injury: who benefit most?

R. Wobma[1], R.H.M. Nijland[1], G. Kwakkel[2]
[1]Amsterdam Rehabilitation Research Centre, Reade, Rehabilitation & Rheumatology, AMSTERDAM, The Netherlands
[2]Amsterdam Movement Sciences, Amsterdam Neurosciences, VU Medical Center, AMSTERDAM, The Netherlands

Objective: Peer support facilitates patients and caregivers in adjusting to long term disabilities. This study aimed to determine which patient characteristics are related to need for peer support during rehabilitation after acquired brain injury

(ABI) and investigate factors that explain whether peer support is perceived as meaningful or not. **Design:** A prospective cohort study over a period of 17 months following ABI patients during inpatient rehabilitation. **Methods:** Peer support was provided during inpatient rehabilitation. Multivariable logistic modelling was applied to identify patient and intervention characteristics that were related to (1) need for peer support and (2) whether or not peer support was perceived as meaningful. Additional information on duration and subjects of conversation were reported. **Results:** 120 ABI patients ≥ 18 years were included and assessed at admission, 94 patients were assessed at discharge. Seventy-three percent (N=88) expressed a need for peer support and at discharge 76.6% (N=72) perceived contact as meaningful. Non-Western and single patients perceived a significantly higher need for peer support. Patients younger than 60 and those with time between ABI and discharge of >3 months perceived their contact significantly more meaningful. **Conclusions:** Results provide more insight into characteristics of ABI patients who may benefit from peer support during inpatient rehabilitation. Optimal dosage, length of contact, rehabilitation phase and strategy for the provision of peer support, should be investigated as well as the effects for ABI survivors on outcomes such as coping, self-efficacy, depression and health related quality of life.

R. Wobma- r.wobma@reade.nl

21. Relative aerobic load of daily activities for people after stroke

I.J. Blokland[1], T. IJmker[2], H. Houdijk[2]
[1]Heliomare, WIJK AAN ZEE, The Netherlands
[2]VU university, AMSTERDAM, The Netherlands

Introduction: People after stroke often have a lower aerobic capacity than their healthy peers. On top of that, the aerobic cost of activities of daily living (ADL) is frequently higher in this group. A lower capacity and higher load will result in a high relative aerobic load of ADL, i.e. people need to act at a high level of their maximal capacity. This may cause limitations in daily life. **Methods:** A topical review on aerobic capacity, aerobic load and relative aerobic load in people after stroke performing ADL was performed. Relative load experienced by stroke survivors was estimated based on available data. **Results:** In Figure 1 we display the limited data on aerobic load of people after stroke during tasks of ADL at self-selected pace, relative to the range of reported aerobic capacity of stroke patients1. Additionally, to demonstrate the effect of movement speed on the (relative) aerobic load, the aerobic load of stroke patients, extrapolated to the pace of healthy peers, is presented. **Conclusion:** Available data suggest that aerobic load of ADL for people after stroke lies within the range of their maximal aerobic capacity, while they perform tasks at a slower pace. Likely they reduce their movement speed to limit the relative load in daily life. However, sufficient data to support such a conclusion is lacking. In the FaFaS study we focus on measuring both aerobic load and aerobic capacity to provide more insight in the relative aerobic load of ADL for people after stroke.

Picture 1: https://www.eventure-online.com/parthen-uploads/89/8DCRM/add_1_457059_d82a66d9-dfe6-4a4c-b3fc-cdb4382a0d95.png
Caption 1: Aerobic load of ADL

I.Blokland- i.blokland@heliomare.nl

22. The course of depressive symptoms in the first 12 months post-stroke and the association with unmet needs

D.C.M. Meiland[1], I.F. Groeneveld[1,2,3], H.J. Arwert[2,4], S.L. van der Pas[5], T.P.M. Vliet Vlieland[1,2,3], P.H. Goossens[1,3]
[1]Rijnlands Rehabilitation Centre, LEIDEN, The Netherlands
[2]Sophia Rehabilitation Centre, THE HAGUE, The Netherlands
[3]Leiden University Medical Centre, Dept of Orthopaedics, Rehabilitation and Physical Therapy, LEIDEN, The Netherlands

[4]Haaglanden Medical Centre, Dept of Rehabilitation, THE HAGUE, The Netherlands
[5]Leiden University Medical Centre, Dept of Medical Statistics and Bioinformatics, LEIDEN, The Netherlands

Introduction: Post-stroke depression is a frequent complication of stroke. To reduce depressive symptoms post-stroke, possible modifiable factors associated should be determined. **Objective:** To describe trajectories of depressive symptoms during the first 12 months post-stroke and to examine associations between those trajectories and unmet needs. **Patients/methods:** Prospective cohort study among stroke patients admitted to inpatient rehabilitation. Post-stroke depressive symptoms were assessed three, six and twelve months post-stroke using the Hospital Anxiety and Depression Scale (≥8) and described into three trajectories: no, non-consistent or persistent depressive symptoms. The association between trajectories and unmet needs 12 months post-stroke (using the Longer-Term Unmet Needs questionnaire) was investigated using multinomial logistic regression analyses, adjusting for age, education level, localisation of stroke and SAQOL-39g physical domain. **Results:** 151 patients were included. No, non-consistent and persistent depressive symptoms were present in 62.9%, 25.2% and 11.9% of patients respectively. Median number of unmet needs 12 months post-stroke was higher in patients with persistent (n=4.5;p=0.000) or non-consistent (n=3;p=0.000) compared to no depressive symptoms (n=0), even when adjusted for confounders (OR=1.28,95%CI=1.05;1.55,p=0.014 and OR=1.20,95%CI=1.02;1.42,p=0.029 respectively). **Conclusion/discussion:** Stroke patients with persistent or non-consistent depressive symptoms within 12 months post-stroke are more likely to have unmet needs than patients with no depressive symptoms. However, this study cannot determine the causality of the association found. **Clinical message:** We suggest that unmet needs must be routinely assessed in patients with non-consistent and persistent depressive symptoms. Further research is required to investigate whether addressing unmet needs can reduce post-stroke depressive symptoms.

D.C.M. Meiland- dee@rrc.nl

23. New principles and technologies for stroke rehabilitation: a case study with the rehabilitation gaming system

B.R. Ballester, M. Maier, K. Grechuta, P.F.M.J. Verschure
Institute for Bioengineering of Catalonia, BARCELONA, Spain

Stroke is a leading cause of serious long-term disabilities in adults. Ubiquitous technological solutions open new advantages for augmenting rehabilitation through the implementation of evidence-based neurorehabilitation principles. The Rehabilitation Gaming System (RGS) was designed to promote self-paced, individualized, intense, ecologically valid, goal oriented and motor imagery based training. In this systematic review, we explore the benefits of RGS across 10 experimental conditions targeting upper-limbs motor recovery. This homogeneous set of intervention protocols allowed for unmasking the effects of distinct rehabilitation principles embedded in the training schedules. In comparison to occupational therapy, RGS showed a positive impact in functional and structural recovery as captured by standardized clinical scales and imaging data. A bootstrapping method revealed a marked impact of RGS-based training on Fugl-Mayer scale with 1-2 % of improvement per week. An improvement was observed not only in the range of motion, speed, and strength but also in the performance of activities of daily living and independence. Specifically, patients treated with RGS presented a significantly faster improvement during the acute phase and reached a higher level of recovery at the chronic stage, supporting the proportional recovery rule hypothesis. Further, in more recent studies, an extended version of the RGS protocol showed positive effects on the amount of use of the more affected arm and these changes in use were associated with sustained functional gains. These results confirm that rehabilitation protocols should be grounded on well-defined principles that underlie stroke recovery, independently of the technologies used.
Picture 1: https://www.eventure-online.com/parthen-uploads/89/8DCRM/add_1_461168_e884d0c5-9f48-4c61-ac8c-f41123fb492d.png

B.R. Ballester- brubio@ibecbarcelona.eu

24. Health related quality of life after traumatic brain injury

Y.T.A. van de Pasch[1], S.J.S. Sep[1,2], W.G.M. Bakx[1,2]
[1]Maastricht University, MAASTRICHT, The Netherlands
[2]Adelante centre of expertise in rehabilitation and audiology, HOENSBROEK, The Netherlands

Introduction: The Quality of Life after Brain Injury(QOLIBRI) questionnaire is developed to assess health related quality of life(HRQoL) after traumatic brain injury(TBI). The validity of the Dutch language version has not yet been investigated. **Objective:** To make recommendations on future validation approaches of the Dutch QOLIBRI. **Patients:** 106 individuals admitted to Adelante for clinical rehabilitation after TBI between 2005 and 2007 (age 38.4±13.7y, 73% men, 14,2% severe TBI, 65,1% moderate TBI, 19,8% good recovery, 6 months-15 years since TBI. **Methods:** We performed a systematic search of the literature on HRQoL after TBI to summarize assessment instruments used in clinical studies, and approaches used to validate the QOLIBRI. Additionally, in a Dutch cohort, we analyzed correlations between QOLIBRI and short form 36(SF-36) and Hospital Anxiety and Depression scale(HADS). **Results:** QOLIBRI and SF-36 were used most often to assess HRQoL after TBI in existing observational studies (n=29). Mean QOLIBRI HRQoL in the Dutch cohort differed by age, with higher scores in younger individuals (58±10≤40y, 52±11>40y, $p<0.01$). Overall, Dutch scores appeared to be slightly higher than observed in other cohorts. Both existing validation studies (n=12) and the Dutch cohort analyses revealed mostly weak to moderate correlations between the QOLIBRI, SF-36 and HADS (range 0,3-0,7). **Discussion and conclusions:** Since the QOLIBRI is a condition-specific instrument, it contains novel information not provided by other available measures. **Clinical message:** In future studies, construct validity of the Dutch QOLIBRI needs to be determined by (partial) correlations with measures of disability, mood state, general wellbeing and satisfaction.

Y.T.A. van de Pasch- y.vandepasch@student.maastrichtuniversity.nl

25. Reliability of a short form upper extremity functional capacity evaluation in patients with complaints of the arm or hand

R.J. Berduszek, C.K. van der Sluis, R. Dekker, M.F. Reneman
University of Groningen, University Medical Center Groningen, GRONINGEN, The Netherlands

Introduction: Upper Extremity Functional Capacity Evaluation (UE-FCE) is a performance-based measurement composed of several tests. Typical UE-FCE tests consist of multiple repeated trials. A Short Form (SF) UE-FCE is more efficient and beneficial for both patient and observer. SF UE-FCE has been found reliable compared to the regular protocol in healthy subjects yet has not been assessed in patients. **Objective:** Compare SF UE-FCE protocols (one or two-trial) with a regular UE-FCE protocol (three trials for hand grip strength, pinch strength and Purdue Pegboard Test (PPT) and four for Complete Minnesota Dexterity Test (CMDT)) and assess the measurement properties of the most concise UE-FCE. **Patients:** Adult outpatients visiting the department of rehabilitation medicine UMCG with complaints of their hand, wrist and/or forearm, diagnosed as (non)specific complaints of the arm, neck and shoulder (CANS). **Methods:** A comprehensive UE-FCE was conducted. Intraclass Correlation Coefficient (ICC) between SF and regular protocols was calculated. **Results:** Measurements have been completed in 36 patients. In all hand and pinch grip tests ICCs ranged from 0.93 to 0.99 (1 versus 3 trials). In PPT and CMDT ICCs ranged from 0.92 to 0.95 (2 versus 3 trials). **Discussion and conclusions:** For all UE-FCE tests an SF protocol is reliable in patients with CANS. For hand and pinch grip strength a one-trial protocol is recommended, for PPT and CMDT a two-trial protocol is recommended. Measurement properties need further assessment (follow from ongoing analysis). **Clinical message:** An SF UE-FCE instead of a longer regular protocol can be applied in clinical practice.

R.J. Berduszek- r.j.berduszek@umcg.nl

26. Development, validity and reliability of the revised Upper Extremity Work Demands (UEWD-R) scale

R.J. Berduszek, N.W. Jacobs, M.A. Cavalini, C.K. van der Sluis

University of Groningen, University Medical Center Groningen, GRONINGEN, The Netherlands

Introduction: The revised Upper Extremity Work Demand (UEWD-R) Scale is a six-item self-report questionnaire to measure the workload of the upper limbs. This revised version was developed since analysis of the original Upper Extremity Work Demands (UEWD) scale learned that it needed rephrasing and could be shortened. UEWD-R consists of a force/posture scale and a repetition scale. Psychometric properties are unknown so far. **Objective:** Assess construct validity and test-retest reliability of UEWD-R. **Patients:** Healthy workers with different occupations and different levels of physical work demands (based on four Dictionary of Occupational Titles (DOT) categories, sedentary to heavy work) were included. **Methods:** Construct validity was determined by testing 11 predefined hypotheses regarding UEWD-R related to other constructs, including a videotaped workplace observation using the Rapid Upper Limb Assessment (RULA). Correlations between these measures were calculated using Spearman correlation coefficients. Test-retest reliability was determined using the intraclass correlation coefficient (ICC) for agreement. The smallest detectable change (SDC) was calculated. **Results:** Fifty-four participants participated (63% men, mean age 39.4 years). The four DOT categories were equally represented. Nine out of 11 predefined correlations were confirmed (82%), indicating good construct validity. The test-retest reliability was good (ICC agreement=0.79). The SDC was 4.85. **Discussion and conclusions:**

Construct validity and the test-retest reliability of UEWD-R were good. However, further research is advised to assess the validity of the UEWD-R not only by testing associations with RULA, but also with other observational measures. Clinical message:

UEWD-R can be used to evaluate the workload of the upper extremities.

R.J. Berduszek- r.j.berduszek@umcg.nl

27. The interpretation of change score of the Pain Disability Index after vocational rehabilitation is baseline dependent

-

28. Cross-cultural adaptation and psychometric properties of the Hand Function Sort for Dutch speaking patients with complaints of hand and/or wrist

A. Muskee, R.J. Berduszek, R. Dekker, M.F. Reneman, C.K. van der Sluis

University of Groningen, University Medical Center Groningen, GRONINGEN, The Netherlands

Introduction: Musculoskeletal complaints of arm, neck and shoulder (CANS) can lead to loss of work productivity. To help assess the functional consequences of impairments in work, patient-rated outcomes can be important. The Hand Function Sort (HFS) is a self-reported pictorial questionnaire which focuses on task performance. **Objective:** Cross-cultural adaptation of the HFS into the HFS-Dutch Language Version (HFS-DLV) and determine construct validity, internal consistency, reliability, responsiveness and floor/ceiling effects. **Patients:** 114 patients with disorders of hand, wrist and/or forearm classified as specific or nonspecific CANS. **Methods:** The HFS was translated into Dutch using international guidelines. Construct validity was assessed with Pearson's correlation coefficients between the HFS-DLV and the Dutch version of the QuickDASH, PRWHE, PDI, RAND-36, NRS-pain and Work Ability Score. Internal consistency was assessed by Cronbach's α and reliability by a test-retest procedure. A global rating of change after 4-8 weeks of hand therapy was used to determine responsiveness. **Results:** 6 predefined hypotheses (67%) were confirmed. Cronbach's α was 0.98. Test-retest reliability ICC was 0.980. The area under the ROC curve was 0.822, with a minimal important change of 37/248 and smallest detectable change of 28/248. There were no floor/ceiling effects. **Discussion/conclusion:** The reliability and responsiveness of the HFS-DLV were good. Internal consistency was high, suggesting redundancy. For construct validity the presumed direction of correlations was correct, but less than 75% of hypotheses was confirmed.

Clinical message: The HFS-DLV can be used in research or clinical practice for Dutch patients with CANS, e.g. to evaluate self-reported functional ability.

A. Muskee- a.muskee@umcg.nl

30. Comparison of pre-injury recalled health-related quality of life (HRQoL) data of trauma patients and HRQoL of the general population: can educational level explain the difference?

N. Kruithof[1], J.A. Haagsma[2], L. de Munter[1], S. Polinder[2], M.A.C. de Jongh[3]
[1]ETZ Hospital (Elisabeth-TweeSteden Ziekenhuis), TILBURG, The Netherlands
[2]Erasmus MC University Medical Centre, ROTTERDAM, The Netherlands
[3]Brabant Trauma Registry, TILBURG, The Netherlands

Introduction: Differences exist between retrospectively collected pre-injury Health-related Quality of Life (HRQoL) of trauma patients and the HRQoL of the general population. Compared to the general population, the trauma population includes a larger proportion of individuals with a low level of socio-economic status. **Objective:** To compare pre-injury HRQoL with HRQoL of a sample of Dutch individuals stratified by age, gender and especially educational level. **Patients:** Hospitalized trauma patients (n=2987). **Methods:** Within three months post-trauma, pre-injury HRQoL was collected with the EuroQol-five-dimension-3-level (EQ-5D-3L) questionnaire. The reference cohort (n=1839) included a sample of the Dutch general population. Multiple regression analyses were used to compare the HRQoL of both cohorts. **Results:** A higher recalled pre-injury HRQoL was reported compared to the HRQoL of the reference cohort after adjustment for age and after stratification of gender. After stratification for gender and after adjustment for age and educational level, the Beta showed a ≥10% increment, suggesting that educational level is a confounder for HRQoL. After adjustment for age, gender and educational level, the injury cohort reported less problems on the 'pain/discomfort' and the 'anxiety/depression' dimensions, but reported significantly more problems on the 'self-care' dimension. **Discussion and conclusions:** When HRQoL of the general population is used as a norm to measure change in HRQoL due to trauma, it is strongly advisable to adjust for educational level besides age and gender. **Clinical message:** When no corrections are made for educational level, the difference between pre-injury HRQoL and general population norms are most likely to be underestimated.

N. Kruithof- n.kruithof@etz.nl

31. Validation and reliability of the Abbreviated World Health Organization Quality of Life Instrument (WHOQOL-BREF) in the hospitalized trauma population

N. Kruithof[1], J.A. Haagsma[2], M. Karabatzakis[1], M.C. Cnossen[2], L. de Munter[1], C.L.P. van de Ree[1], M.A.C. de Jongh[3], S. Polinder[2]
[1]ETZ Hospital (Elisabeth-TweeSteden Ziekenhuis), TILBURG, The Netherlands
[2]Erasmus MC University Medical Centre, ROTTERDAM, The Netherlands
[3]Brabant Trauma Registry, TILBURG, The Netherlands

Introduction: While the number of patients surviving their trauma is increasing, it is important to measure Quality of Life (QoL). The Abbreviated World Health Organization Quality of Life (WHOQOL-BREF) questionnaire can be used to assess QoL. However, its psychometric properties in trauma patients are unknown. **Objective:** To investigate the validity and reliability of the WHOQOL-BREF for the hospitalized trauma population. **Patients:** Hospitalized trauma patients (n=202). **Methods:** Floor and ceiling effects and missing values of the WHOQOL-BREF were examined. Confirmatory factor analysis (CFA) was performed to examine the underlying dimensions of the questionnaire. Cronbach's alpha (CA) was calculated to determine internal consistency. Hypotheses were formulated to determine construct and discriminant validity. To determine construct validity, Spearman's correlations were calculated between Health-related Quality of Life and psychological measures. Discriminant validity between patients with minor injuries and moderate/severe injuries was examined by conducting Mann-Whitney-U-tests. Results: The WHOQOL-BREF showed no problematic floor and ceiling effects. The CFA revealed a moderate model fit. The domains showed good internal consistency, except of the social domain. All individual items and domain scores of the WHOQOL-BREF showed nearly symmetrical distributions since mean

scores were close to median scores, except of the 'general health' item. The WHOQOL-BREF showed moderate construct and discriminant validity. **Discussion and conclusion:** The present study provides support for using the WHOQOL-BREF for the hospitalized trauma population since the questionnaire appears to be valid and reliable. **Clinical message:** The WHOQOL-BREF can be used to assess QoL in a heterogeneous group of hospitalized trauma patients accurately.

N. Kruithof- n.kruithof@etz.nl

32. A personally tailored aerobic exercise program in slowly progressive neuromuscular diseases: pilot study on the efficacy.

E.L. Voorn, M.A. Brehm, F.S. Koopman, F. Nollet
Academic Medical Center Amsterdam, AMSTERDAM, The Netherlands

Introduction: In individuals with neuromuscular diseases (NMD), symptoms of muscle weakness, fatigue and pain may lead to reduced physical activity, causing deconditioning. At present, clear guidelines to individually prescribe and evaluate aerobic training programs are lacking, hampering effective application in neuromuscular rehabilitation. Therefore, we recently developed the B-FIT training guideline. **Objective:** To evaluate the preliminary effectiveness of a personally tailored aerobic training program according to B-FIT on the physical fitness of individuals with slowly progressive NMD. **Patients and methods:** Sixteen individuals with various slowly progressive NMD followed a 4 month training program according to B-FIT, under supervision of trained physical therapists from the rehabilitation department of 2 university hospitals in the Netherlands. The polarized home-based training program included two low-intensity sessions (i.e. below the anaerobic threshold [AT]) and one high-intensity session (i.e. above the AT) per week. Submaximal exercise tests were performed before and after the training program to evaluate the effect on the physical fitness. **Results:** Compliance rates were high and we found significant reductions in HRsubmax (-7.2 beats per minute, p=0.005) and RPEsubmax (-1.7, p=0.081) and an increase in Wpeak (15.2 Watt, p=0.000). Physical therapist and patient experiences were positive. **Conclusions:** Following a personally tailored aerobic training program according to B-FIT improves physical fitness in individuals with slowly progressive NMD. **Clinical message:** The results of this study are promising and support the use of B-FIT in daily clinical practice. In follow-up projects we will translate the guideline into English and evaluate its efficacy in a multicenter RCT.

E.L. Voorn- e.l.voorn@amc.uva.nl

34. What is known about the content and efficacy of treatment for upper limb impairments in children with bilateral spastic cerebral palsy? A systematic review

V.F.P. Plasschaert[1], J.E. Vriezekolk[1], P.B.M. Aarts[1], A.C.H. Geurts[2], C.H.M. Van den Ende[1]
[1]Sint Maartenskliniek, UBBERGEN, The Netherlands
[2]Donders Institute for Brain, Cognition and Behaviour, Radboud University MC, NIJMEGEN, The Netherlands

Aim: To systematically review the content and efficacy of interventions for improving upper limb function in children 0-19 years of age with bilateral cerebral palsy based on outcome measures of upper limb function and measures of activities and/or participation according to the International Classification of Functioning, Disability and Health. **Methods:** Cochrane, Pubmed, Embase, CINAHL, and Web of Science were searched from inception to September 2017. Methodological quality and strength of evidence were analyzed by three independent raters using Sackett's level of evidence, and the American Academy for Cerebral Palsy and Developmental Medicine (AACPDM) guidelines. **Results:** Fifteen studies with a large variety of interventions and heterogeneity in outcome measures met the inclusion criteria. Twelve studies provided level IV evidenceaccording to AACPDM guidelines. For three small RCTs the level of evidence was II. Only one of these RCTs showed strong methodological quality; a study on Hand-arm bimanual intensive therapy including lower extremity (HABIT-ILE). **Conclusion:** We identified a large variety of interventions, heterogeneity in outcome measures, and generally weak to moderate methodological quality for the majority of studies. We recommend further research on intensive activity-based, task-specific bimanual training programs for children with bilateral spastic cerebral palsy using high quality (multicenter) trials.

V.F.P. Plasschaert- v.plasschaert@maartenskliniek.nl

35. Gender-specific differences in quality of life and mental functioning before and after cardiac rehabilitation

L. Mulder, J.J.L. Meesters, E.H.T. Los-van Mechelen
Sophia Revalidatie, DEN HAAG, The Netherlands

Introduction: Female patients may have different problems and needs after a cardiac event. This study compares gender differences in health-related quality-of-life (HRQoL), anxiety and depression before and after cardiac rehabalitation (CR). **Method/Design:** Prospective study, including patients referred to CR at 'Sophia Revalidatie Delft' during a 24-month period. **Patients:** Adult patients after MI or cardiac surgery from different regional hospitals with both pre and post-CR data, were included. Intervention: A 9-week 2-3 times a week program, focused on: physical exercise, education, relaxation and individual counseling. Outcomes: Pre- and post-treatment, patients completed questionnaires to assess HRQoL (Quality of Life after Myocardial Infarction, QLMI, 0-7;low-high) and mental functioning (Hospital Anxiety Depression scale, HADS, 0-21;low-high). **Statistical analysis:** Unpaired t-tests (mean(SD);p-value) were used to compare baseline and change scores for HRQoL and mental functioning between men and women. Results: Women and men differed on mean(SD) age on baseline (63.7(10.4) vs. 61.9(10.1);p=0.028). At baseline, women scored significantly worse than men on QLMI (4.9(0.9) vs. 5.3(0.9);p<0.001), depression (4.1(3.5) vs 3.2(3.4);p=0.002) and anxiety (6.3(4.0) vs. 4.6(3.9);p=0.001).
Both women and men improved significantly on all domains pre-post treatment (HRQoL:0.7(0.9);p=0.000/0.5(0.7);p=0.000, depression:-1.3(3.2);p=0.000/-0.7(2.3);p=0.000, anxiety:-1.3(3.3);p=0.000/-1.1(2.7);p=0.000). Concerning the change scores, women improved significantly more than men on HRQoL (p=0.003) but no significant differences were found on HADS-depression (p=0.052) and HADS-anxiety (p=0.59). **Conclusion:** Pre-treatment, women scored worse on mental functioning and HRQoL, but improved more on HRQoL than men, suggesting that there are gender differences before and after CR.

L. Mulder- l.mulder@sophiarevalidatie.nl

36. Monitoring daily physical activity of upper extremity in boys with Duchenne Muscular Dystrophy

A. van der Geest[1], J. Essers[2], A. Bergsma[3], M. Jansen[1], I.J.M. de Groot[1]
[1]RadboudUMC, NIJMEGEN, The Netherlands
[2]Maastricht University, MAASTRICHT, The Netherlands
[3]Twente University, ENSCHEDE, The Netherlands

Introduction: Accelerometry of the Upper Extremity (UE) potentially provides information on the extend of activities in daily life in Duchenne Muscular Dystrophy (DMD) patients.
Objective: To evaluate three UE acceleration based parameters in boys with DMD in home situations.
Patients: 15 DMD patients (age 7-17 years) with Brooke UE rating scale between 1-4.
Methods: A cross-sectional study. Included patients were monitored for 1-3 days with accelerometers on both lower arm (LA) and upper arm (UA) and 1 on the wheelchair. Intensity, elevation level and the frequency of transfers of elevation level were calculated and compared with two functional assessments: the Brooke scale (higher score means worse in functionality) and the Performance of Upper Limb (PUL) score.
Results: Correlations of accelerometer data with the PUL scores were very high for intensity (LA: R=0,824; p=0,00 and UA R=0,842; p=0,00) and for the frequency of transfers from mid to high (R=0,89; p=0,00). Both intensity of LA and UA and the frequency of transfers was about 2 times higher in patients with Brooke score 1-2 compared to Brooke score 3-4 (p<0,05). A very strong correlation was seen between the measurements of the UA and LA accelerometer (R= 0,954; p 0,00).
Discussion and Conclusion: Both intensity and the frequency of transfers correlated well with functional measurements.
Clinical Message: Accelerometry of the upper extremity seems to be a promising method to measure activity at home in patients with Duchenne Muscular Dystrophy (DMD).

A.van der Geest- Annette.vanderGeest@radboudumc.nl

37. Measuring rehabilitation outcomes in children with Developmental Coordination Disorder (DCD); which instruments to choose?

I. Heus[1], I. Koehler[2], D. Wezenberg[2], S. Severijnen[1], M. Van Pomeren[2], T.P.M. Vliet Vlieland[1], M. van der Holst[1]

[1]Rijnlands Rehabilitation Center, LEIDEN, The Netherlands
[2]Sophia Rehabilitation, THE HAGUE, The Netherlands

Introduction: Although measuring outcome of rehabilitation in children with DCD is considered important there is no consensus on which instrument to use. **Objective:** The aim of this prospective study was to investigate the responsiveness of six instruments to assess rehabilitation outcome in DCD (MovementABC-2 (MABC-2), Canadian Occupational Performance Measure (COPM), Systematische Opsporing Schrijfproblemen (SOS-2-NL), DCDdaily, Behaviour Rating Inventory of Executive Function (BRIEF) parents/teachers, TNO-AZL children's Quality of Life (TACQOL)). **Patients/Methods:** Forty-one children (34 Boys, mean age 8 years,SD1.5) receiving outpatient multidisciplinary rehabilitation for DCD were included (mean total physical and occupational treatment time 32.8 hours, mean total duration 20 weeks). All instruments were applied pre- and post-treatment. Change-scores were calculated (paired t-test/Wilcoxon-test) and compared to Meaningful Clinical Difference (MCD) values where possible; Responsiveness was further evaluated by computing Effect-sizes (ES) and Standardized Response Means (SRM). **Results:** Significant differences over time were seen in the COPM, DCDdaily-QS (quality score) and MABC-2 (all p<0.05). The ES and SRM of these three instruments were moderate-high (COPM ES:1.62/SRM:1.70, DCDdaily-QS ES:0.80/SRM:0.89, MABC-2 ES:0.41/SRM:0.42). The change-score of the COPM but not that of the MABC-2 was higher than the MCD.**Discussion/Conclusion:** Although the MABC-2 is the most widely used instrument, the COPM and DCDdaily-QS were more responsive, whereas SOS-2-NL, BRIEF and TACQOL were not responsive to change after rehabilitation for DCD. **Clinical message:** When measuring rehabilitation outcome in DCD, the COPM and DCDdaily-QS seem to be a valuable and responsive addition to the MABC-2, but they may be used with other instruments depending on individual needs.

M. van der Holst - meh@rrc.nl

38. Energy expenditure management through cognitive behavioural therapy in pediatric rehabilitation; a multiple case report

M. van der Holst, K. Prodöhl, M. Dieleman, W. Van Zomeren, K. Van Dijk, M. Haanstra, A. Koenis, M. Köhrner, T.P.M. Vliet Vlieland
Rijnlands Rehabilitation Center, LEIDEN, The Netherlands

Introduction: A lack of energy to meet tasks and demands of everyday life can be a serious problem for children with mobility disorders treated in a rehabilitation center. Managing energy expenditure is an important rehabilitation goal. **Objective/patients:** To assess the feasibility of a generic eight-week cognitive behavioural intervention module on energy expenditure management for children aged 6-18 years. **Methods:** The intervention consisted of eight 1-hour group-sessions and eight individual sessions combining psychology, occupational and physical therapy concerning energy balance, graded activity and psycho-education. Assessments were done pre- and post-treatment and included the Canadian Occupational Performance Measure (COPM: performance and satisfaction, lower scores, worse functioning) and Functional Disability Inventory Children's questionnaire (FDI-C, lower score, better functioning). Parents and children rated their satisfaction with the intervention on a 10-point scale. **Results:** All 4 children who started completed all 16 sessions of the module (2 girls, mean age 9.4(SD:1.7) range 6.8-10.7). The mean COPM performance and satisfaction scores improved from 3.5(SD:0.6) and 3.5(SD:0.5) to 5.8(SD:1.5) and 5.9(SD:1.6) and mean FDI-C scores from 22.5(SD:4.3) to 19.7(SD:16.2) after treatment. The mean parents' and children's satisfaction scores were 7.5(SD:0.5) and 8.0(SD:2.3), respectively. **Discussion/conclusions:** Preliminary results show that the generic energy expenditure management module is feasible and promising regarding its ability to provide guidance for children with mobility disorders. **Clinical message:** This eight-week generic module may be of added value to rehabilitation treatment of children with mobility disorders and energy expenditure problems. However, more research is needed to provide further evidence.

M. van der Holst- meh@rrc.nl

39. Changes in motor capacity and motor performance and their relationship in children with spastic cerebral palsy

E. Halma[1], J.B. Bussmann[2], H.J. van den Berg-Emons[2], E.M. Sneekes[2], R. Pangalila[3], F.C. Schasfoort[2]
[1]Libra Rehabilitation and Audiology, EINDHOVEN, The Netherlands
[2]Erasmus MC University Medical Center, ROTTERDAM, The Netherlands
[3]Rijndam Rehabilitation, ROTTERDAM, The Netherlands

Introduction: Children with cerebral palsy (CP) are less physically active and spend more time sedentary than their healthy peers. Therefore, optimizing their physical behavior (motor capacity and motor performance) is a common treatment goal. **Objective:** To clarify if motor capacity and objectively measured motor performance have changed in children with spastic cerebral palsy (CP) after an intensive treatment period. Subsequently, we examined whether these changes are related to each other. **Patients and Methods:** A secondary analysis on prospective clinical trial data was performed. Sixty-five children (37 boys, 28 girls) with spastic CP, mean age 7 years and 3 months, GMFCS level I-III, were involved in a 12-week intensive treatment period. Motor capacity (Gross Motor Function Measure (GMFM), functional muscle strength (FMS), and walking speed) and motor performance (Actigraph activity monitor) were measured at baseline, 12 weeks and 24 weeks. **Results:** A significant improvement in motor capacity after 12 weeks was found for GMFM (mean change score 1.01; p=0.002) and FMS (mean change score 1.14; p=0.003); after 24 weeks all capacity outcome measures significantly improved (p=<0.001 to 0.01). We did not find any significant improvements in motor performance after 12 and 24 weeks. No significant correlations were found between change scores for motor capacity and motor performance. Discussion and Conclusions: After a period of intensive treatment motor capacity improved, but motor performance not. The change in motor capacity was not accompanied by a corresponding change in objectively measured motor performance. **Clinical message:** Current treatment programs should be evaluated to see how motor performance can be improved.

E. Halma- ilsehalma@gmail.com

40. Self-reported health related quality of life (HRQoL) in adolescents and young adults (AYA) with traumatic brain injury in comparison with their peers with an orthopedic trauma

H. Kranenborg, F. van Markus-Doornbosch
Sophia Rehabilitation Centre, THE HAGUE, The Netherlands

Introduction: Relatively little is known about HRQoL in AYA after mild traumatic brain injury (mTBI). **Objective:** To compare HRQoL between a hospital-based cohort of AYA after mTBI and orthopedic injury controls (OI). **Patients:** A cross-sectional survey study among patients aged 15-24 years with either mTBI or OI from the clinical registry of the emergency room(ER) of two hospitals in The Hague. **Methods:** 306 mTBI and 321 OI patients were invited to complete an online questionnaire. HRQoL was assessed with the TNO-AZL-Questionnaire (0-100;low–high HRQoL): adolescent version (6 domains, TACQOL, aged <16 years) and young adult version (12 domains, TAAQOL, aged ≥16). Comparisons in patient characteristics and HRQoL between TBI and OI were analysed by Mann-Whitney U-test. **Results:** 48(16%) patients with mTBI and 50(16%) with OI responded to the questionnaire. Patients with OI and mTBI were not significantly different in age (median 16 yrs(IQR15-17) vs. 18 yrs(IQR17-19), female gender (23(49%) vs 26(51%) or months since ER visit (16(15-17) vs. 16(15-17).
In the adolescent group there were no significant differences between the mTBI and OI group regarding all the HRQoL domains. In the young adult group in HRQoL was significantly lower in TBI than in OI patients regarding the domains cognition (22 vs. 32);p=0.015), sleep (22 vs. 32);p=0.012), pain (22 vs. 31);p=0.032), activities (22 vs. 32);p=0.021), vitality (22 vs. 33);p=0.010)) and aggressive emotions (23 vs. 31);p=0.044). **Discussion/Conclusion:** Young adults after mTBI report significantly lower HRQoL in important life domains than patients after OI, whereas in younger children no significant differences were found.

H. Kranenborg- kranenborg.h@gmail.com

41. Parents' perspectives on the impact of Marfan syndrome on daily life of children, parents and families; a qualitative study

J. Warnink-Kavelaars[1], R.H.H. Engelbert[1,2], S. Dekker[1], L.A. Menke[3], F. Nollet[1], J.A.J.M. Beelen[1]
[1]Academic Medical Center, Department of Rehabilitation, University of Amsterdam, Amsterdam Movement Sciences, AMSTERDAM, The Netherlands
[2]ACHIEVE, Center of Applied Research, Amsterdam University of Applied Sciences, Faculty of Health, AMSTERDAM, The Netherlands
[3]Academic Medical Center, Department of Pediatrics, University of Amsterdam, AMSTERDAM, The Netherlands

Introduction: Marfan syndrome (MFS) is a genetic connective tissue disorder. Although clinical manifestations of MFS in children are well described, the impact thereof on daily life received little attention in literature. **Objectives:** the aim of this qualitative study was to explore parents' perspectives on the impact of MFS on daily life of children with MFS aged 4-12 years, parents and families. **Participants:** ten parents participated in semi-structured interviews, sixteen parents participated in three focus groups **Methods:** a thematic analysis approach was used to identify, analyze, report and interpret the impact of MFS on daily life. Concepts on daily life of children were linked to the ICF-CY categories. Concepts on daily life of parents and families were assigned to newly defined codes. **Results:** Themes identified from parents' qualitative responses on the impact of MFS on daily life of children included "being different from peers" and "participation restrictions in school, sports and leisure". Themes identified from parents' daily lives included "concerns about their child's development" and "lack of understanding and support". Themes identified from family life included "family schedule adjustments", "strong family relationships" and "family planning". **Discussion and conclusion:** Parents perceive a large impact of MFS on daily life of children, parents and family. **Clinical message:** These findings may help professionals better understand challenges experienced by children with MFS, parents and families and target their support needs. Tailored rehabilitation and education programs will enable children's optimal participation in daily life, empower families and support them to create a manageable, balanced family life.

J. Warnink-Kavelaars- j.warnink@amc.nl

42. Groningen Spine Cohort: very high impact on functioning, quality of life and work in patients with chronic low back pain seeking tertiary multispecialty care

A.L. Dutmer, M.F. Reneman, A.P. Wolff, R. Soer, H.R. Schiphorst Preuper
University Medical Center Groningen, GRONINGEN, The Netherlands

Introduction: A minority of patients with chronic low back pain (CLBP) account for a majority of disability and costs. This subgroup has potentially most to gain from effective treatment. The Groningen Spine Cohort will provide a 10-year prospective insight into the burden of CLBP for patients referred to multispecialty tertiary spine care in the Netherlands. This study reports first baseline results. **Objective:** To study the impact of CLBP on functioning, quality of life, and work in patients visiting the UMCG tertiary spine center. **Patients:** Adult patients with CLBP. **Methods:** Patient-reported baseline questionnaire prior to first visit. Primary outcomes: NIH minimal dataset Impact Stratification score (range 8-50), functioning (Pain Disability Index, PDI; 0-70), quality of life (EuroQol-5D, EQ5D; -0.33-1.00), work ability (single-item Work Ability Score, WAS; 0-10), and work participation (absenteeism, disability). Descriptive statistics were applied. **Results:** N=1457 patients (age m=46.3, sd=12.8 years, 57% female) were included. NIH Impact Stratification m=35.3±7.4; severe impact (≥35) for 58% of patients. PDI = 38.3±14.0; EQ5D = 0.43±0.30; WAS = 3.8±2.9. Absenteeism: 43% of workers. Permanent work disability: 16%. **Discussion and conclusions:** In patients seeking multispecialty tertiary spine care, the impact of CLBP on functioning, quality of life and work ability is very high; even higher than what is already know about the burden of the average patient with CLBP. **Clinical message:** Further research (related to stepped and matched care) and (more) effective personalized interventions are urgently needed to reduce the burden of CLBP in a subgroup of patients seeking multispecialty tertiary spine care.

A.L. Dutmer- a.l.dutmer@umcg.nl

43. The effect of exercise therapy combined with psychological therapy on physical activity and quality of life in patients with painful diabetic neuropathy: A systematic review of the current literature.

C.C.M. van Laake-Geelen[1], R.J.E.M. Smeets[2], S.P.A.B. Quadflieg[1], J. Kleijnen[3], J.A. Verbunt[1]
[1]Adelante Zorggroep, HOENSBROEK, The Netherlands
[2]Libra Revalidatie, location Weert/Eindhoven, WEERT, The Netherlands
[3]Maastricht University, MAASTRICHT, The Netherlands

Objective: To provide an up-to-date overview of the current literature on the effects of rehabilitation interventions that combine exercise therapies with psychological therapies that aim to improve physical activity (PA) and quality of life (QoL) in patients with Painful Diabetic Neuropathy (PDN). Search strategy: Databases such as EMBASE, MEDLINE and Medline In-Process citations & e-Pubs ahead-of-print in Ovid, Pedro, Web of Science, PsycINFO in Ovid, CENTRAL in Wiley, PubMed and Google Scholar were searched, in any language. The review protocol was registered with PROSPERO (CRD42018081664). Selection of articles: All relevant randomized controlled trials, observational studies, single case studies, cross-sectional studies and experimental studies that investigated interventions combining exercise therapy with psychological interventions in patients with PDN (DM I and II), aged > 18 years, were included. Outcome measures were PA and QoL. **Evaluation of articles and results:** The search resulted in 1602 records after removing duplicates. After screening on title and abstract, 99 records remained. All 1503 articles were excluded on title and abstract. There was not a single study that reported on combined (physical and psychological) therapies. Through a secondary hand search, a total of 3 reviews were identified that described a total of 4 studies regarding either physical OR psychological interventions. These studies reported moderate effects of mindfulness meditation, cognitive behavioural therapy, aerobic exercise and Tai Chi. **Conclusion:** Although there is increasing evidence that patients with PDN could benefit from rehabilitation treatments that integrate physical with psychological interventions, there is no current literature regarding these combined treatments.

C.C.M. van Laake-Geelen- c.laake@adelante-zorggroep.nl

44. Reliability of ventilatory thresholds determined in people with spinal cord injury

I. Kouwijzer[1], R.E. Cowan[2], J.L. Maher[2], F. Groot[3], F. Riedstra[3], L.J.M. Valent[4], L.H.V. van der Woude[5], S. de Groot[6]
[1]Heliomare Rehabilitation Center, WIJK AAN ZEE, The Netherlands
[2]Miller School of Medicine & The Miami Project to Cure Paralysis, MIAMI, USA
[3]Sport- en Beweegkliniek, HAARLEM, The Netherlands
[4]Research and Development, Heliomare Rehabilitation Center, WIJK AAN ZEE, The Netherlands
[5]University of Groningen, University Medical Center Groningen, GRONINGEN, The Netherlands
[6]Reade, AMSTERDAM, The Netherlands

Introduction: To increase physical capacity in individuals with spinal cord injury (SCI), individualized training schemes based on training zones are necessary. Boundaries of these zones are defined by two ventilatory thresholds (VTs), determined during an arm crank graded exercise test (GXT). **Objective:** To study whether VTs could be determined during a GXT in individuals with SCI; and to study intra- and interrater reliability. **Patients:** 30 individuals with tetraplegia (N=11) or paraplegia (N=19). **Methods:** Participants performed a GXT that incremented every minute. Two blinded sports physicians assessed all 30 GXTs in a random sequence for both VTs twice. The power output, heart rate and oxygen uptake at each VT was compared between the two sessions and two raters using the intraclass correlation coefficient (ICC) and Bland Altman plots. **Results:** Of the 240 VTs to be assessed, 23 VTs could not be determined: 91% were VT2s and 70% belonged to individuals with tetraplegia. For the determined VTs, the ICCs were high to very high (0.82 – 1.00) for intra- and interrater reliability. Bland Altman plots showed relatively small to wide 95% limits of agreement for intra- and interrater reliability. **Discussion and conclusions:** For some individuals with tetraplegia, determination of VT2 might be challenging. The relative agreement for VTs that could be determined, was high to very high, although the absolute agreement varied. **Clinical message:** The reliability of VT determination is high, however, for some individuals with tetraplegia, VT determination might be challenging. For those individuals, other training methods should be considered.

I. Kouwijzer- i.kouwijzer@heliomare.nl

45. Course of walking performance and its determinants in people with Chronic Idiopathic Axonal Polyneuropathy (CIAP): a 4 year follow up study.

K. van Oeijen[1], L.L. Teunissen[2], C. van Leeuwen[3], M. van Opstal[2], M.J.H. van der Putten[4], N.L.U. van Meeteren[5], N.C. Notermans[6], C.D. Schröder[3]

[1]Rijndam Rehabilitation, ROTTERDAM, The Netherlands
[2]St Antonius Hospital, NIEUWEGEIN, The Netherlands
[3]Brain Center Rudolf Magnus, University Medical Center Utrecht,Utrecht University, UTRECHT, The Netherlands
[4]University Medical Center Utrecht, UTRECHT, The Netherlands
[5]School for Public Health and Primary Care (CAPHRI), MAASTRICHT, The Netherlands
[6]Rudolf Magnus Institute of Neuroscience, University Medical Center Utrecht, UTRECHT, The Netherlands

Introduction: People with CIAP perceive sensory symptoms and develop distal muscle weakness, affecting their daily functioning. Earlier research focussed on transversal observations, whereas activity limitations over time has not been investigated. **Objective:** To assess the course of walking performance, in people with CIAP over a period of 4 years and to establish determinants of change over time. Participants: People diagnosed with CIAP (N=92) in the Netherlands. Methods: Walking performance was measured using the shuttle walk test (SWT) and a pedometer (mean step count a day) at inclusion, 6 months, 1 and 4 years thereafter. Self-reported walking was measured using the subscale physical functioning of the short-form 36 questionnaire (SF-PH). Depression & perceived behaviour control (PBC) were measured using questionnaires, muscle strength (Mstrength) using a MicroFET ® hand-held dynamometer. **Results:** Random coefficient analysis showed a significant decrease in mean scores on SWT, stepcount and SF-PH over 4 years time. Decline in walking performance was associated with age and Mstrength and decline in self-reported walking was associated with age, comorbidity, Mstrength, PBC and depression. Discussion: In patients with CIAP there is a decline in walking performance over time which is faster than can be explained by aging alone. Age and low Mstrength were associated with a decrease in

walking performance over time. Depression, comorbidity and PBC were only associated with a decrease in self-reported walking activity. **Clinical message:** People with CIAP and objective walking performance decline as measured with a SWT might benefit from an active lifestyle focussed on retaining muscle activity.

K. van Oeijen- kvoeijen@rijndam.nl

46. Exploring the care trajectory for older persons with SCI in the Netherlands

T.C. Crul[1], J.M. Stolwijk-Schwüste[1], C.F. van Koppenhagen[2], M.W.M. Post[1]
[1]De Hoogstraat Rehabilitation, UTRECHT, The Netherlands
[2]UMC Utrecht, UTRECHT, The Netherlands

Introduction: The mean age at onset of Spinal Cord Injury (SCI) is increasing. Whether current SCI inpatient rehabilitation programs need adjustment to better fit the needs and capacities of older people remains uncertain. This study's objective was to evaluate the current care trajectory of older people with SCI in The Netherlands.
Methods: Hospital data were analyzed on people with SCI admitted to De Hoogstraat Rehabilitation since 2000. Also, six people with recent SCI older than 60 years and four physicians (hospital, rehabilitation center, nursing home) were interviewed. **Results:** Mean age at admission to De Hoogstraat rose from 43.8 (95% CI 39.3 to 48.3) in 2000 up to 61.5 (95% CI 55.6 to 67.5) years in 2017. Four participants were discharged to specialized rehabilitation after triage from a rehabilitation physician. Two participants, without triage from a rehabilitation physician, were discharged home. The four persons in specialized rehabilitation were satisfied with the intensity. Physicians mentioned that older people with high comorbidity are better fitted at geriatric rehabilitation, instead of specialized rehabilitation, because of lower physical capacity and cognitive inability to live independently after rehabilitation. **Conclusion:** Age at onset of SCI in De Hoogstraat is increasing. Older people in specialized rehabilitation were all satisfied with their treatment. People seen by a rehabilitation physician in-hospital were discharged to specialized rehabilitation. Physicians agreed that only in case of high comorbidity transfer to a nursing home should be considered. Future research should focus on identifying specific geriatric needs and exploring where these needs are best realized.

Poster will be presented by J. Stolwijk

T.C. Crul- timcrul@gmail.com

PhD Thesis Platform

The scientific committee would like to offer a new platform for researchers to value and to further distribute the results of their research and to put them into the limelight: The PhD thesis platform. During the conference, researchers who recently obtained their PhD degree on a topic that is related to rehabilitation medicine will have the opportunity to present their PhD thesis during the lunch breaks. This year we have one presenter.

Infants at very high risk of cerebral palsy - a challenging population

Tjitske Hielkema

Date of PhD defence: 13-09-2017
University Medical Center Groningen, department of Paediatrics and department of Rehabilitation Medicine
Promotors: Prof. Dr. M. Hadders-Algra and Prof. Dr. J.H.B. Geertzen

In general, developmental course of newborns is hard to predict. Risk factors, such as brain lesions or atypical movements, assist prediction of neurodevelopmental disorders, including cerebral palsy (CP). CP is the most common physical disability in paediatrics, causing limited mobility. In my PhD-thesis, effects of early intervention in infants at very high risk of CP are studied. Typical infant physiotherapy (TIP) was compared with a new family centred programme: COPing with and CAring for infants with special needs (COPCA). Interventions were studied in two different projects: the VIP-project and the LEARN2MOVE0-2-study. After applying one of the two mentioned intervention methods, child and family outcome in the two groups was similar. Detailed analysis of the contents of the interventions, indicated several positive associations between specific COPCA-elements and outcome: with child outcome in the VIP-project and with family outcome in the LEARN2MOVE0-2-study. Over the years, family involvement in the TIP-intervention increased. To be able to study outcome of intervention studies for high risk infants adequately, appropriate measurements are needed. Therefore, suggestions have been provided for specific motor measurements. With the results of this thesis, we hope to improve care for infants at high risk of CP and their families.

Biography
Tjitske Hielkema, MD PhD, carried out the PhD-project at Department of Paediatrics, division Developmental Neurology, of the University Medical Center of Groningen (UMCG). During this PhD-project, she started as a trainee at the Department of Rehabilitation Medicine of the UMCG. In 2016, she started working as a paediatric rehabilitation physician at this department.

Congress Organisation

Netherlands Society of Rehabilitation Medicine (NSRM) and the Dutch Congress of Rehabilitation Medicine (DCRM)

Scientific Committee

- Prof. C.A.M. van Bennekom MD PhD (chair)
- A.I. Buizer MD PhD
- J.B.J. Bussmann PhD
- R. Dekker MD PhD
- A. Huisinga MD
- J.J.L. Meesters PhD
- J. van Meeteren MD PhD
- A. Mert MD PhD
- M. Post PhD
- J. Stolwijk - Swüste MD PhD
- Prof. J. Verbunt MD PhD
- N. Voet MD PhD
- J. Voorman MD PhD

Organising Committee

- W.M. Hoek-Scholten MBA, director NSRM
- S. van Haaster-Houwing MSc, projectmanager NSRM/ DCRM

Postal address: Postbus 9696, 3506 GA Utrecht, The Netherlands
T. +31 30 27 39 685
E. congres@revalidatiegeneeskunde.nl
www.rehabilitationmedicinecongress.nl

Congress secretariat
Congress Care
T. 073 690 1415
E. info@congresscare.com