Programme Overview DCRM 2020

Donderdag 12 november 2020

Tijdstip	Programma onderdeel
12.45 - 13.00	Inloop online DCRM 2020
13.00 - 13.05	Start congres
13.05 - 13.35	**Plenaire spreker 1: Lucien Engelen**
13.35 - 13.45	**Poster pitches van top 10 beste posters**
13.45 - 14.10	Pauze
14.10 - 15.10	**Parallel sessie A: workshops en mini-symposia**
15.15 - 16.45	**Plenaire spreker 2: prof. dr. ir. Jaap Harlaar**
15.45 - 16.10	Pauze
16.10 - 16.45	**Poster sessie**
16.50 - 17.50	**Parallel sessie B: PhD sessie en free paper sessies**
17.55 - 18.00	Afsluiting dag 1 congres
18.00	Virtuele borrel

Vrijdag 13 november 2020

Tijdstip	Programma onderdeel
8.45 - 9.00	Inloop online DCRM 2020
9.00 - 9.05	Opening congres dag 2
9.05 - 10.05	**Parallel sessie C: workshops en mini-symposia**
10.05 - 10.25	Pauze
10.25- 10.55	**Plenaire spreker 3: dr. Jorit Meesters**
11.00 - 12.00	**Parallel sessie D: workshops en mini-symposia**
12.00 - 12.20	Pauze
12.20 - 12.30	**Uitreiking beste PhD prijs, beste presentatie, beste poster**
12.30 - 13.00	**Plenaire spreker 4: dr. Femke van Nassau**
13.00 - 13.05	Afsluiting congres

Keynotes

1. Lucien Engelen
2. Prof. dr. ir. Jaap Harlaar
3. Dr. Jorit Meesters
4. Dr. Femke van Nassau

Lucien Engelen

Zal revalidatie-geneeskunde straks -net als eerste lijn-geneeskunde vooral vanuit de supermarkt worden vormgegeven?

De komende jaren staat er op het vlak van gezondheid(szorg) veel te gebeuren waarbij technologie exponentiële mogelijkheden gaat bieden. Dit vraagt iets van de zorgorganisatie maar ook van hun medewerkers. Het is dan ook niet zo zeer een technologische revolutie die er aan komt als wel een op het vlak van de cultuur. Denken in kánsen met een realistische kijk, is de rode draad van de lezing van Lucien. Ontwikkelingen die hij meeneemt uit zijn wereldwijde verkenningen, tonen soms een onverwacht beeld van de toekomst.
Een deel van deze technologische mogelijkheden leidt tot nieuwe kansen. Via beeldbellen zijn een deel van de consulten op afstand mogelijk, en is het doen van (kracht)metingen op afstand binnen handbereik.
Op diverse plaatsen zien we een deel van de zorgverlening dicht naar de patient toe verschuiven. Zo opent Walmart momenteel complete mini-klinieken (incl radiologie, laboratoria, huisartsen geneeskunde en fysiotherapie) en gaat Wallgreens met VillageMD in zee om 750 huisartsen-praktijken toe te voegen aan hun winkels. Zou een deel van het revalidatie-portfolio ook in een dergelijke setting plaats kunnen vinden...?

Met zijn bedrijf Transform.Health werkt Lucien Engelen op het snijvlak van innovatie en strategie en adviseert hij directies, overheden, bedrijven en professionals. Hij is Edge Fellow voor het Deloitte Center for the Edge (Amsterdam, Melbourne en San Francisco) en Faculty member bij de Singularity University in Silicon Valley en in Nederland. Zijn modus operandi is uitdagend, soms provocerend maar altijd techno-realistisch. Zijn doel is om zich voor te bereiden op een zachte landing in de toekomst en tegelijkertijd een wereldwijd en duurzaam zorgsysteem voor iedereen te creëren. Functies: CEO Transform.Health & Keynote speaker, Fellow Center for the Edge Deloitte: Global Strategist Digital Health, Faculty Singularity University USA Exponential Medicine Silicon Valley, Author: Augmented Health(care), Initial member The Washington Post' Collective.

Prof. dr. ir. Jaap Harlaar

Meer informatie volgt.

Dr. Jorit Meesters

Publiek-private samenwerking in innovatie binnen de revalidatiesector. Hoe voeg je in een Fieldlab waarde toe voor alle partijen?

Zorginnovaties hebben de grootste kans van slagen als ze op relatief eenvoudige wijze ingezet kunnen worden en een probleem in de zorg oplossen. Medtech bedrijven zijn heel sterk in het bedenken van technologische oplossingen. Professionals in de revalidatie zijn heel goed in het identificeren van problemen in de zorg en bedenken hoe innovaties optimaal in de zorg ingezet kunnen worden. Veel innovaties die vanuit één invalshoek starten, mislukken omdat er onvoldoende wordt uitgegaan van elkaars behoeften en onvoldoende geprofiteerd wordt van elkaars expertise.

Een goede samenwerking tussen de Medtech bedrijven en de revalidatiesector kan hiervoor de oplossing bieden. In het gebied rondom Basalt (Zuid-Holland Noord) is een Fieldlab opgericht dat de samenwerking tussen beide sectoren versterkt. Door het organiseren van events en het starten van projecten worden kansrijke producten (een stap dichter) naar de markt gebracht. In de keynote lezing wordt aan de hand van dit Fieldlab gepresenteerd hoe samenwerking in een Fieldlab waarde toevoegt voor de patiënt, de revalidatiearts, de behandelaar, het bedrijfsleven en de revalidatiesector.

Jorit Meesters is hoofdonderzoeker eRevalidatie bij Basalt en daarnaast als senior onderzoeker werkzaam bij het Leids Universitair Medisch Centrum en het lectoraat Revalidatie van de Haagse Hogeschool. Een belangrijke lijn binnen zijn onderzoeksgroep is het onderzoek naar de meerwaarde van de inzet van eHealth en zorgtechnologie in de revalidatiezorg. In het proces van ontwikkelen, evalueren en implementeren van eHealth en zorgtechnologie werkt hij o.a. samen met Medtech bedrijven, revalidatieartsen, behandelaars en patiënten in verschillende field- en livinglabs in de zorg..

Dr. Femke van Nassau

Implementatie onderzoek en praktijk: Wat kunnen we leren van implementeren?

Een groeiende groep onderzoekers en zorgprofessionals herkennen het belang van effectieve implementatie en implementatie onderzoek. Gezondheidswinst door interventies en kwaliteitsnormen is immers alleen te behalen als ze op een effectieve manier worden geïmplementeerd. Implementatie onderzoek is het onderwerp tijdens de presentatie van Femke. Ze legt uit wat implementatie onderzoek is, welke factoren een rol spelen en waarom het belangrijk is om vanaf dag één na te denken over implementatie. Ze zal de rol van stakeholders en hun zorgen toelichten en manieren uitleggen om die belemmeringen aan te pakken. Femke is betrokken bij verschillende projecten en zal putten uit haar ervaringen met het uitvoeren van implementatie onderzoek, zoals ingaan op wat er nodig is om een evidence-based programma implementeerbaar te maken en voorbeelden geven met een focus op borging.

Tijdens de presentatie gaat Femke ook in op manieren waarop het vakgebied van 'implementatie onderzoek' zich ontwikkelt, inclusief nadruk op nieuwe meetmethoden (meer pragmatische benaderingen), aanpassing aan verschillende contexten en de-implementatie.

Femke van Nassau (PhD) is opgeleid als bewegingswetenschapper in Maastricht. Tijdens haar PhD onderzoek (VU Universiteit) evalueerde zij de landelijk opschaling van een overgewicht preventieprogramma op middelbare scholen. Tijdens dat onderzoek is haar passie voor implementatie onderzoek ontstaan, met name voor determinanten van implementatie, selectie van implementatie strategieën en het meten van implementatie, zoals tijdens een procesevaluatie. Ze heeft het haar missie gemaakt om het gat tussen de praktijk en wetenschap kleiner te maken en mensen praktische handvatten te geven om implementatie en onderzoek daarnaar te verbeteren. In haar rol als senior onderzoeker bij de afdeling Sociale Geneeskunde van het Amsterdam UMC is zij betrokken bij diverse implementatie onderzoeken, zoals Physicians Implement Exercise is Medicine (PIE=M), leefstijlprojecten en Waardegedreven Zorg trajecten. Ze is mede initiatiefnemer van het Nederlands Implementatie Collectief (NIC; https://nederlandsimplementatiecollectief.nl/), organisator het Nederlandse Implementatie congres (2017-2019) en het European Implementation Event dat in mei 2021 in Rotterdam plaatsvindt. Tevens is ze oprichter van de implementatie interesse groep van de ISBNPA society, waar ze nu past-president is.

Parallel sessie A

A1. Workshop: Handvatten voor innovatie in het scholingsprogramma
A2. Workshop: 'Wheel-I' 2.0: the Esseda, wheelchair ergometry and performance monitoring
A3. Mini-symposium: Cochrane Rehabilitation: improving Evidence Based Clinical Practice in the near future (in English)
A4. Mini-symposium: Lessons learned from 8 years of innovation in patient care
A5. Mini-symposium: The road from strength to daily activities in children with cerebral palsy
A6. Mini-symposium: Management of gait disorders after stroke; it's time for (inter)national consensus!
A7. Mini-symposium: Rehabilitation technology: training to assist or assisting to train?

A1 Handvaten voor innovatie in het scholingsprogramma

Marieke Bolk[3], Vincent de Groot[1], Laura Haffmans[2], Danieque Ploegmakers[4]
[1]Amsterdam UMC, [2]Rijndam, [3]Federatie Medisch Specialisten, [4]Klimmendaal, the Netherlands

A1. Workshop: Handvatten voor innovatie in het scholingsprogramma, November 12, 2020, 2:10 PM - 3:10 PM

Het Landelijk Opleidingsplan 'BETER in Beweging' is inmiddels in werking gesteld. Om het scholingsprogramma aan te laten sluiten bij het opleidingsplan is modernisering noodzakelijk. De Scholingscommissie en het Concilium zijn bezig met de ontwikkeling hiervan en delen graag hun ervaringen. In deze workshop leggen we uit waarom en hoe het scholingsprogramma gemoderniseerd gaat worden. Na een toelichting op de onderliggende onderwijskundige principes, zullen de contouren van het nieuwe scholingsprogramma worden geschetst. Daarmee is het nieuwe programma echter nog niet af; de exacte invulling moet de komende jaren nog plaatsvinden. Daarom gaan we vervolgens actief aan de slag: hoe kun je zelf landelijk, regionaal of lokaal onderwijs moderniseren? Hoe start je hiermee, en welke tools zijn er al beschikbaar voor blended learning? Ter afsluiting zullen de resultaten van de pilot van de scholingscommissie getoond worden.

Deze interactieve sessie is bedoeld voor alle betrokkenen bij onderwijs van de opleiding tot revalidatiearts.

Chair(s)
Laura Haffmans, revalidatiearts en voorzitter Scholingscommissie

Outline session
Programma

Introductie door voorzitter scholingscommissie Laura Haffmans

Aanleiding (LOP, individualisering) door voorzitter Concilium Vincent de Groot

Leren door volwassenen door Marieke Bolk

Contouren nieuwe scholingsprogramma aios Scholingscommissie Danique Ploegmakers

Opdracht: ontwerp onderwijs door Marieke Bolk

Ervaringen pilot kinderrevalidatie door betrokkene pilot

Afsluiting door Laura Haffmans en Vincent de Groot

Learning Objective(s)
Op de hoogte zijn van laatste ontwikkelingen in modernisering scholingsprogramma Handvatten krijgen om zelf het scholingsprogramma te moderniseren

A2 'Wheel-I' 2.0: the Esseda, wheelchair ergometry and performance monitoring

PhD MSc Rick de Klerk[1], PhD MSc Rowie Janssen[1], PhD MSc Thomas Rietveld[1], Prof PhD Luc van der Woude, Assistant prof Riemer Vegter[1]
[1]*University Medical Center Groningen, University of Groningen, the Netherlands*

A2. Workshop: 'Wheel-I' 2.0: the Esseda, wheelchair ergometry and performance monitoring, November 12, 2020, 2:10 PM - 3:10 PM

Worldwide an estimated 1% of the population is depending on any form of wheeled mobility. A vast majority will use manually propelled wheelchairs. In the Western world hand rim wheelchairs are by far the preferred mode of manual propulsion due to size, weight, manoeuvrability and transportability, as well as its natural integration into human movement behavior and body scheme.

Science-informed regular wheeled mobility rehabilitation makes a difference with the use of reliable and valid individualized systematic monitoring, testing and training, as well as with ergonomic optimization of vehicle mechanics and wheelchair-user interface. The Esseda is a dual roller computer-controlled and instrumented wheelchair ergometer. Following Wheel-I 2.0, wheelchair ergometry in an individual's own wheelchair on the Esseda ergometer allows submaximal, maximal aerobic and anaerobic testing and training, while observing physiology and biomechanics with a cardiometabolic cart and simple 2D kinematics. On-screen or head-mounted virtual reality can further support wheelchair motor learning and skill. This will all help maintain the thin balance between power production and power requirements of healthy, safe, efficient and comfortable everyday wheeled mobility and athletics. The workshop will showcase wheelchair ergometry and performance monitoring with the Esseda ergometer in a 'Wheel-I 2.0' environment.

Chair(s)
Dr Riemer Vegter, Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen
Prof Lucas HV van der Woude, Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen

Workshop partners: Rick de Klerk, Riemer Vegter, Thomas Rietveld, Rowie Janssen (UMCG-UoG)

Outline session
Hand rim wheelchair propulsion is indeed also straining for the upper body, the cardiorespiratory and musculoskeletal systems. Consequently, it may lead to upper body overuse problems, especially in shoulders and wrists, and fatigue and discomfort-based inactivity. An inactive lifestyle in turn may lead to cardiometabolic diseases in the long run.

PhDs Rick de Klerk, Thomas Rietveld and Rowie Janssen will showcase wheelchair ergometry essentials with the dual-roller computer controlled wheelchair ergometer, Esseda.

Examples of standardized submaximal and peak (an)aerobic exercise testing and their outcomes (processing and presentation) will be highlighted on the Esseda.

Individualized repeated wheelchair testing over time provides a knowledge base of instruction and advise.

It can also assist in a further refinement of wheelchair mechanics details as well as the interfacing between user and wheelchair (e.g. seat-height and for-aft position, camber angle, hand rim size and form).

Learning objective(s)
Chairs: Riemer Vegter, Luc van der Woude (UMCG-UoG) Workshop partners: Rick de Klerk, Riemer Vegter, Thomas Rietveld, Rowie Janssen (UMCG-UoG) To recognize the importance of wheeled mobility training, monitoring and testing within a knowledgeable context and specific testing environment. Standardised testing involves individualized re-calibration and goal-setting. Power output (W) is the prime outcome measure in wheeled mobility testing and training.

A3 Cochrane Rehabilitation: improving Evidence Based Clinical Practice in the near future

Dr PhD Lotty Hooft[2], Dr MD PhD Charlotte Kiekens[3], Prof. MD PhD Thorsten Meyer[4], Prof. MD PhD Stefano Negrini[5], Dr. Nicole Voet[1]

[1]Rehabilitation centre Klimmendaal and Radboud University Medical Center, the Netherlands [2]Julius Center Research Program Methodology, Utrecht, The Netherlands, [3]Montecatone Rehabilitation Institute, Imola (bologna), Italy, [4]Institute for Epidemiology, Social Medicine and Health System Research, Hannover, Germany, [5]University "La Statale", Milan, Italy. IRCCS Istituto Ortopedico Galezzi,, Milan, Italy

A3. Mini-symposium: Cochrane Rehabilitation: improving Evidence Based Clinical Practice in the near future (in English), November 12, 2020, 2:10 PM - 3:10 PM

Cochrane is a British international charitable organisation formed to organise medical research findings to facilitate evidence-based choices about health interventions involving health professionals, patients and policy makers. The idea of a Cochrane Rehabilitation (CR) Field was launched in 2016. CR is aimed to ensure that all rehabilitation professionals can apply Evidence Based Clinical Practice, combining the best available evidence as gathered by high quality Cochrane systematic reviews (CSR). Rehabilitation interventions are complex, difficult to standardise, with different components and contents and a lack of existing 'standard care'. As a consequence, RCTs are complex or lacking because they are unfeasible due to some clinical questions and it is difficult or impossible to include alternative designs in CSRs. In CSRs, the evidence of Rehabilitation research is systematically downgraded due to unavoidable characteristics of rehabilitation (e.g. lack of blinding). However, one in 11 CSRs are on rehabilitation interventions. In this workshop, members of CR and a CSR author will help you bringing evidence into practice, give examples of reporting in Rehabilitation research, give examples of alternatives for RCTs and share experiences in writing a CR.

Chair(s)
Lotty Hooft, PhD (director Cochrane Nederland)
Asssociate professor Department of Epidemiology Julius Center Research Program Methodology

Carlotte Kiekens, MD (Co-Director Cochrane Rehabilitation)
Spinal Unit Director, Montecatone Rehabilitation Institute, Imola (Bologna), Italy

Prof. Thorsten Meyer, PhD, psy and MD (executive committee Cochrane Rehabilitation)
Head of the Integrative Rehabilitation Research Unit at the Institute for Epidemiology, Social Medicine and Health System Research of Hannover Medical School, Germany

Prof. Stefano Negrini, MD (Director Cochrane Rehabilitation)
Department of Biomedical, Surgical and dental Sciences, University “La Statale”, Mila, Italy. IRCCS Istituto Ortopedico Galezzi, Milan, Italy.

Nicole Voet, PhD and MD (Cochrane Review author)
Rehabilitation physician Rehabilitation centre Klimmendaal, Arnhem, the Netherlands and Radboud University Medical Centre Nijmegen, the Netherlands

Outline session
Cochrane in the Netherlands (15 min)

Lotty Hooft (director Cochrane Netherlands)

How can Cochrane Rehabilitation help you to bring evidence to practice? (20 min)

Carlotte Kiekens (co-director Cochrane Rehabilitation)

Cochrane Rehabilitation projects: reporting in rehabilitation research (REREP, RCTRACK), rehabilitation definition for research purposes (20 min)

Stefano Negrini (director Cochrane Rehabilitation)

What to do when a Randomized Controlled Trial (RCT) is not possible? (20 min)

Thorsten Meyer (executive committee Cochrane Rehabilitation)

Experience from a Cochrane Review author (15 min)

Nicole Voet (Cochrane Review author)

Learning objective(s)
1. learn more about the Cochrane organization
2. learn practical skills to report rehabilitation research
3. learn about alternatives for randomized controlled trials
4. learn about the experiences from a Cochrane author

A4 Lessons learned from 8 years of innovation in patient care

MD Inez van der Ham
Rijndam Revalidatie, the Netherlands

A4. Mini-symposium: Lessons learned from 8 years of innovation in patient care, November 12, 2020, 2:10 PM - 3:10 PM

The rehabilitation medicine sector is an innovative sector. Scientific research reveals a lot of knowledge, new technology is continuously developed to support rehabilitation programs, but how does the patient benefit from innovation in the daily practice?

For 8 years the Ipsen Rehabilitation annual award for innovation within patient care* is awarded within the Netherlands. This price has been rewarded to a project which has the best innovative initiative to improve direct patient care, preferably for a larger group of patients. The innovation needs to be implemented within one year after winning the award. A committee selects the best initiative to improve patient care.

A selection of the award winners will present their results and experiences on implementing patient innovation within rehabilitation. Questions they will answer: what have they done and what are results of their innovations? How did the patient benefit from their innovation? What are their lessons learned when implementing new initiatives? How did they share their innovations? What are (future) plans, with focus on further development and implementation?

*The Ipsen Rehabilitation annual award for innovation within patient care is financially support by Ipsen Farmaceutica B.V. for terms and regulations of this award see: https://revalidatiegeneeskunde.nl/ipsen-revalidatie-jaarprijs

Chair(s)
I. (Inez) van der Ham MD, Rijndam Revalidatie

Outline session
- introduction chair
- presentation price winning innovation number 1
- presentation price winning innovation number 2
- presentation price winning innovation number 3
- presentation price winning innovation number 4
(- presentation price winning innovation number 5)
- Overall conclusion implementation of innovations

Learning objective(s)
Learn from best practices and pitfalls which are shared about improving implementation of innovation

Comment(s)
Speakers are not yet known

A5 The road from strength to daily activities in children with cerebral palsy

PhD Lieke Brauers[2], Ing Jasper de Boer[3], PhD Koen Dekkers[1], PhD Mellanie Geijen[1], PhD Eugene Rameckers[1], Prof. MD PhD Rob Smeets[1]

[1]Maastricht university, the Netherlands [2]Maastricht University and Hasselt University, Maastricht, the Netherlands And Hasselt, Belgium, [3]UMACO, Groningen, the Netherlands

A5. Mini-symposium: The road from strength to daily activities in children with cerebral palsy, November 12, 2020, 2:10 PM - 3:10 PM

In children with Cerebral Palsy muscle weakness is a very important disabling factor in daily functioning. Assessment of upper limb muscle strength should be an essential part of rehabilitation both in clinical reasoning and evaluation. During this workshop new insights regarding muscle strength measurements of the upper limb in children with CP will be presented; we will start with an overview of the assessment methods of muscle strength, strength measurements in fatigability and functional strength. The relevance as well as gaps for clinical reasoning and evaluation of these assessment tools will be presented on the basis of known clinimetric characteristics such as reliability, validity and responsiveness. Next, the development and clinimetric data of an innovative ADL- test and training device will be discussed, followed by the demonstration of the potential of gaming in ADL strength training interventions as an innovative future rehabilitation technology. These innovative possibilities will be presented and discussed in the context of multidisciplinary treatment programs, especially focused on near future home- based ADL strength training in children with CP. Finally, the potential use for other patient groups will be discussed.

Chair(s)
Prof. Rob J.E.M. Smeets (MD, PhD), professor in Rehabilitation Medicine, Research School CAPHRI, dept. of Rehabilitation Medicine, Maastricht University, the Netherlands; CIR Revalidatie, location Eindhoven, the Netherlands

Eugene, Rameckers, PhD PT. Senior Researcher Centre of Expertise , Hoensbroek, the Netherlands. and Department of Rehabilitation Medicine, Research School CAPHRI, Maastricht University, Maastricht, the Netherlands and Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Hasselt, Belgium;

Outline session
Assessing Strength: an update about the status quo (Dr. K. Dekkers) (15min)
Strength: peak or fatigue: new aspects of measurement (L.Brauers) (15min)
Assessment of task-oriented strength: new evidence (Dr. M. Geijen) (15 min)
Strength and daily activities: new developments in testing and training:
ADL-TTD & gaming. (Dr. E.Rameckers & Ing. J. de Boer) (30 min)
Questions & Group discussion (led by the chairman, Dr. R. Smeets) (15 min)

Speakers
Koen Dekkers; PhD student, Revant Rehabilitation Centres, Breda , The Netherlands. and Research School CAPHRI, Department of Rehabilitation Medicine, Maastricht University, Maastricht, The Netherlands.
Lieke Brauers; PhD student, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Hasselt, Belgium and Department of Rehabilitation Medicine and Research School CAPHRI, Department of Rehabilitation Medicine, Maastricht University, Maastricht, The Netherlands.
Mellanie Geijen; PhD student, Research School CAPHRI, Department of Rehabilitation Medicine, Maastricht University, Maastricht, The Netherlands.

Eugene, Rameckers, PhD PT. Senior Researcher Centre of Expertise , Hoensbroek, The Netherlands. and Department of Rehabilitation Medicine, Research School CAPHRI, Maastricht University, Maastricht, the Netherlands and Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Hasselt, Belgium;
Jasper de Boer; Ing, Umaco B.V. A Lode Holding Company

Learning objective(s)
● To give an overview of the clinimetric properties of different types of strength assessments including strength measures to calculate fatigability.
● To demonstrate new approaches in functional strength testing in daily activities, including the presentation of novel technological assessment methods
● To demonstrate gaming possibilities for ADL strength training and the use of gaming in children with CP

A6 Management of gait disorders after stroke; it's time for (inter)national consensus!

MD Danielle de Wit[3], MD PhD Judith Fleuren[1], MD PhD Jorik Nonnekes[2], MD PhD Hanneke van Duijnhoven[2], PhD Vivian Weerdesteyn[2]
[1]Roessingh Rehabilitation Centre, Enschede, the Netherlands [2]Radboud university medical center, Nijmegen, The Netherlands, [3]Rijndam Rehabilitation Centre, Rotterdam, The Netherlands

A6. Mini-symposium: Management of gait disorders after stroke; it's time for (inter)national consensus!, November 12, 2020, 2:10 PM - 3:10 PM

Regaining independent gait is often an important goal of a patients' rehabilitation after stroke. Physiatrists are aware of the high variety among clinical settings in the Netherlands concerning the management of gait problems after stroke. Different views, clinical experience and a lack of scientific evidence on more conservative vs. more invasive treatment options contribute to this variation. As gait labs are emerging throughout the country, the need for a uniform approach in treating gait problems after stroke is growing. In 2018 a working group was formed, consisting of gait experts from different Dutch rehabilitation centres, which aims to reach (inter)national consensus and development of a treatment algorithm.

In this minisymposium we present a framework in which we show that independent gait requires balance control and leg motor control. Both balance control and leg motor control are typically affected after stroke, and require different interventions in time. Balance control requires training, not only in the (sub)acute but also in the chronic phase. In addition, medical-technical interventions become more important in the chronic phase to enable full utilization of residual leg motor control. We subsequently elaborate when, how and where these interventions may take place.

Chair(s)
Danielle de Wit, MD
Rijndam Rehabilitation Centre
Rotterdam, the Netherlands
e-mail: ddwit@rijndam.nl

Outline session
Programme (90 min.):

Introduction symposium 10 min.

Presenter/chair: Danielle de Wit

Title presentation 1: The complex interactions between balance control, leg motor control and gait post-stroke: introduction of a framework
Presenters: Vivian Weerdesteyn and Jorik Nonnekes
15 min + 5 min questions

Title presentation 2: Training to improve balance control, the right type at the right time.
Presenter: Hanneke van Duijnhoven
20 min + 5 min questions

Title presentation 3: Interventions to improve leg motor control, leaving a stepwise approach behind?
Presenter: Judith Fleuren
20 min + 5 min questions

Conclusion and discussion
Chair: Danielle de Wit
10 min

Learning objective(s)
- To get insight in the contribution of balance control, leg motor control and time after stroke on poststroke gait
- To acquire knowledge about the possible treatment options and their timing

A7 Rehabilitation technology: training to assist or assisting to train?

PhD Gerdienke Prange-Lasonder[1], PhD Erik Prinsen[1], Prof. MD PhD Johan Rietman[1]
[1]*Roessingh Research and Development, the Netherlands*

A7. Mini-symposium: Rehabilitation technology: training to assist or assisting to train?, November 12, 2020, 2:10 PM - 3:10 PM

Assistive and therapeutic technology each has its place in rehabilitation. Assistive technology, by definition, is technology through which users can do activities that are impossible or more difficult without the technology. Therapeutic technology, by definition, is technology with which the user practices to improve functioning and, ideally, this improved function is maintained after the use of the technology is discontinued.

Traditionally, therapeutic technology was primarily aimed at stimulating recovery or compensation strategies, while assistive technology took over the functions that were no longer present. Nowadays, however, assist-as-needed principles are increasingly incorporated in both assistive and therapeutic technology. With the emergence of highly-adaptive devices questions rise, such as: Can the use of assist-as-needed technology support patients beyond assistance? Can patients actually use and take optimal advantage of such adaptive technology? We state that we need to consider such technology on another level than the technology itself, and pay particular attention to the user-technology interaction. We then encounter interesting concepts that underline a merge of the two fields: Training by assistance and assistance by training.

In this workshop we will present our hypotheses and results of experimental research regarding assist-as-needed rehabilitation technology in this workshop. This will be followed by group discussions.

Chair(s)
Prof Hans Rietman, MD, PhD

Outline session
Introduction symposium
Chair: Prof. Hans Rietman
5 min

Rehabilitation technology to train
Presenter: Gerdienke Prange, PhD
10 min

Rehabilitation technology to assist
Presenter: Erik Prinsen, PhD
10 min

Rehabilitation technology: to train or to assist?
Presenters: Gerdienke Prange and Erik Prinsen
30 min

General discussion and questions
Chair: Prof. Hans Rietman
30 min

Total 90 min

Learning objective(s)
The goals of this workshop are twofold. First, we want to share our experiences and results from clinical evaluation studies of therapeutic and assistive technology and support our statement that these fields are merging together, with evidence. The second goal is to have a group discussion in which participants can reflect on and discuss our statements from a clinical perspective, with a particular aim to discuss how both fields can learn from each other. This will be essential to drive and direct future progress within both fields of technology with attention to the clinical perspective.

Parallel sessie B

B1. PhD thesis sessie
B2. Free paper sessie 1
B3. Free paper sessie 2
B4. Free paper sessie 3
B5. Free paper sessie 4

B1. PhD thesis sessie

Voorzitter: prof. dr. Annemieke Buizer MD
Tijdens het Online DCRM 2020 wordt de PhD thesis Award uitgereikt op het gebied van de revalidatiegeneeskunde voor het academisch jaar 2019-2020. Na afloop van de presentaties zal de jury de winnaar selecteren voor de PhD Award Rehabilitation Medicine 2020.

De drie genomineerden zijn:

- Karen van Hulst - proefschrift: Oral motor performance in children with neurodevelopmental disabilities
- Laura Bonouvrié - proefschrift: Intrathecal baclofen treatmen in children with neurological disorders
- Robert Wouters - proefschrift: No rules of thumb: Outcome Measurement and Treatment for Thumb Base Osteoarthritis

Meer informatie over de drie onderzoeken volgt.

De PhD Award Rehabilitation Medicine is een prijs die jaarlijks wordt uitgereikt aan het beste proefschrift op het gebied van de revalidatiegeneeskunde in Nederland. Het doel van de prijs is om onderzoek van hoge kwaliteit te waarderen en in de schijnwerpers te zetten.

B2. Free paper sessie 1: top 4 presentaties

O1. Visual complaints and disorders in patients with Parkinson's disease - Iris van der Lijn
O2. Virtual reality gait training to improve participation in subacute stroke survivors: randomized controlled trial - Ilona de Rooij
O3. The effectiveness of at-home foot temperature monitoring in reducing the incidence of ulcer recurrence in people with diabetes: a multicentre randomized controlled trial (DIATEMP) - Sicco Bus
O4. The development of the Screening of Visual Complaints questionnaire for patients with neurodegenerative disorders: evaluation of psychometric features in a community sample - Famke Huizinga

B3. Free paper sessie 2: brain injury / stroke

O5. HoMEcare aRm rehabiLItatioN (MERLIN) for chronic stroke patients to improve the upper arm function - Samantha Rozevink
O6. Fatigue in relation to participation and health-related quality of life five years after perimesencephalic subarachnoid hemorrhage - LIanne de Vries
O7. The relationship between relative aerobic load, energy cost and walking speed in stroke patients - Ilse Blokland
O8. Feasibility and effectiveness of gait training assisted by multi-channel functional electrical stimulation in early stroke rehabilitation: a randomized controlled trial - Maijke van Bloemendaal

B4. Free paper sessie 3: Neurodegerative diseases & others

O9. The effect of dance on self-esteem and quality of life in people with Parkinson's disease.
O10. The effect of stance-control knee-ankle-foot-orthoses on walking speed, energy expenditure and satisfaction with walking in polio survivors - Bart Raijmakers
O11. Identifying factors that determine the user's value of upper limb prostheses: a national survey study - Nienke Kerver
O12.The socioeconomic burden of facioscapulohumeral muscular dystrophy - Anna Zielman-Blokhuis

B5. Free paper sessie 4: paediatric & others

O13. Adherence to at-home infrared foot temperature monitoring in people with diabetes at high risk of ulceration - Freek Rovers
O14. The relationship between the physical strain of walking and daily activity time in individuals with neuromuscular diseases - Sander Oorschot
O15. Decision making and selection bias in four observational studies on Duchenne and Becker muscular dystrophy - Karin Naarding
O16. Participation and quality of life in children and young adults with acquired brain injury in a paediatric rehabilitation cohort: the patients' and parents' perspective - Florian Allonsius

B2. Free paper sessie 1: top 4 presentaties

O1 Visual complaints and disorders in patients with Parkinson's disease

Drs. Iris Van Der Lijn[1,2], Drs. Fleur van der Feen[1,2], Dr. Gera de Haan[1,2], Prof. Dr. Teus van Laar[3], Dr. Joost Heutink[1,2]

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B2. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction: Visual disorders of patients with Parkinson's disease (PD) are often not well documented. Consequently, these disorders may be underestimated and patients might not receive appropriate care, resulting in a decline of quality of life.

Objective: We aim to explore the prevalence, nature and severity of visual complaints and visuo-perceptual disorders in patients with PD.
Patients: 350 PD patients and 1054 healthy controls were included in the study.

Methods: We developed a 19-item screening questionnaire for visual complaints, which was completed by all patients and controls. Additionally, 35 patients who reported substantial visual complaints were administered the DiaNAH test battery for visual perception.

Results: Around 90% of patients reported one or more visual complaints. The most common complaints were blurry vision, difficulty focusing and reading (>50%). All 19 complaints were more common or severe in patients compared to controls. The most common disorder on the DiaNAH battery was limited visuomotor speed and visual search in a complex task (>50%). Diminished figure-ground perception, visuocognitive load, and visuospatial functioning were also found in almost 50% of patients. Compared to normative data of healthy individuals, patients attained an abnormal score on an average of 3 out of 11 tests.

Discussion and conclusions: Visual complaints are very common among patients with PD. Furthermore, results show that a range of visual perceptual disorders commonly occur in patients referred for visual care and rehabilitation.

Clinical message: Recognition and knowledge of these visual complaints and disorders are important in order to improve quality of care and rehabilitation.

O2 Virtual reality gait training to improve participation in subacute stroke survivors: randomized controlled trial

MSc Ilona de Rooij[1,2], PhD Ingrid van de Port[1], PhD Michiel Punt[3], MSc Pim Abbink-van Moorsel[1], MD Michiel Kortsmit[1], MD, PhD Ruben van Eijk[4,5], Prof, MD Anne Visser-Meily[2,6], MD, PhD Jan-Willem Meijer[1,2,7]
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B2. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction: People after stroke experience difficulties with walking leading to restrictions in participation in daily life.

Objective: To examine the effect of virtual reality gait training (VRT) compared to non-virtual reality gait training (non-VRT) on participation in community-living people after stroke.
Patients: People were randomly assigned to the VRT or non-VRT group between two weeks and six months after stroke.

Methods: Single-blinded randomized controlled trial with two parallel groups. Participants in the VRT group received training on the Gait Real-time Analysis Interactive Lab (GRAIL) and participants in the non-VRT group received treadmill training and functional gait exercises without virtual reality. Both interventions consisted of twelve 30-minute sessions during six weeks. Primary outcome was the Restrictions subscale of the Utrecht Scale for Evaluation of Rehabilitation-Participation (USER-P). Secondary outcomes included patient experiences, subjective physical functioning, functional mobility, walking ability, dynamic balance, walking activity, fatigue, anxiety, depression, falls efficacy, and quality of life.

Results: The VRT group consisted of 28 and the non-VRT group of 27 participants, of which respectively 28 and 24 were included in the modified intention-to-treat analyses. No significant differences between the groups were found over time for the USER-P Restriction scale (1.23, 95%CI -0.76-3.23, p=0.22) or secondary outcomes. Patients' experiences were positive.

Discussion and conclusions: Treadmill-based VRT appeared a safe intervention that was well experienced by people after stroke. However, the effect of VRT was not statistically different from non-VRT on participation in community-living people after stroke.

Clinical message: VR training might be a valuable addition to stroke rehabilitation.

O3 The effectiveness of at-home foot temperature monitoring in reducing the incidence of ulcer recurrence in people with diabetes: a multicentre randomized controlled trial (DIATEMP)

Dr. Sicco Bus[1], Drs Wouter aan de Stegge[1,2], Dr Jeff van Baal[2], Drs Tessa Busch-Westbroek[1], Dr Jaap van Netten[1]
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B2. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction
The skin in people with diabetic foot disease allegedly heats up before it breaks down allowing for early intervention to prevent a foot ulcer.

Objective
To assess the effectiveness of at-home monitoring of foot temperatures on the incidence of diabetic foot ulcer recurrence in high-risk patients.

Patients
Diabetes, neuropathy and foot ulcer history (<4 years)

Methods
In this multicentre outcome-assessor blinded RCT we randomly assigned 304 patients to usual care or daily at-home infrared thermometry at 6-8 predefined locations on each foot (enhanced therapy). With ΔT>2.2°C between same regions on both feet on two consecutive days, participants were instructed to reduce activity with 50%. Primary outcome was ulcer recurrence on the plantar, interdigital, toe apical or lateral forefoot surfaces in 18 months. Secondary outcomes were recurrence in adherent patients and on any foot site.

Results
On the basis of intention-to-treat, 44 of 151 (29.1%) participants in enhanced therapy and 57 of 153 (37.3%) in usual care had a recurrent ulcer at a primary site (RR 0.782 [95%CI 0.566–1.080], P=0.133). Ulcer-free survival curves were not significantly different between groups (P=0.167). Of 93 adherent participants 31 had a recurrent ulcer (33.3%). In total 54 participants (35.8%) in enhanced therapy and 72 (47.1%) in usual care had a recurrence at any foot site (RR 0.760 [95%CI 0.579–0.997], P=0.046).

Discussion/conclusion and clinical message
At-home foot temperature monitoring in addition to usual care does not significantly reduce incidence of foot ulcer recurrence in diabetes, unless ulcers could occur at any foot site.

O4 The development of the Screening of Visual Complaints questionnaire for patients with neurodegenerative disorders: evaluation of psychometric features in a community sample

Drs. Famke Huizinga[1], Dr. Joost Heutink[1], Dr. Gera de Haan[1,2], Drs. Iris van der Lijn[1,2], Drs. Fleur van der Feen[1,2], Drs. Anne Vrijling[2], Dr. Bart Melis-Dankers[2], Drs. Stefanie de Vries[1,2], Prof. dr. Oliver Tucha[1], Dr. Janneke Koerts[1]

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B2. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction: Patients with neurodegenerative disorders often experience impairments in visual function. Instruments to assess subjective visual complaints in these patients are lacking, while they are of utmost clinical importance to guide assessment and rehabilitation.

Objective: We developed a 21-item Screening of Visual Complaints questionnaire (SVC) for the assessment of subjective visual complaints in patients with neurodegenerative disorders, and evaluated its psychometric properties in a community sample.
Participants: 1,461 Dutch participants (18-95 years).

Methods: The SVC, Cerebral Visual Complaints questionnaire (CVC-q), National Eye Institute Visual Function Questionnaire–25 (NEI-VFQ-25), Behavior Rating Inventory of Executive Function-A (BRIEF-A), Questionnaire for Experiences of Attention Deficits (FEDA), Depression Anxiety Stress Scale–21 (DASS-21) and Structured Inventory for Malingered Symptomatology (SIMS) were administered online. After two weeks, 66 participants completed the SVC again.

Results: The sample was split in two subsamples. In the first subsample, exploratory factor analysis extracted three factors from the SVC: diminished visual perception, altered visual perception and ocular discomfort. Confirmatory factor analysis showed it to be valid in the second subsample. The SVC showed satisfactory convergent validity (NEI-VFQ-25: r=-0.71; CVC-q: r=0.84) and divergent validity (SIMS: r=0.26; BRIEF-A: r=0.29; FEDA: r=0.40; DASS-21: r=0.34) and good internal consistency (Cronbach's alpha=0.85) and test-retest reliability (ICC=0.82).

Discussion and conclusions: The SVC is a valid and reliable tool to assess subjective visual complaints in a community sample and appears promising for clinical use in patients with neurodegenerative disorders. Clinical message: Medical specialists can use the SVC to screen for patients who need further visual assessment and rehabilitation.

O5 HoMEcare aRm rehabiLItatioN (MERLIN) for chronic stroke patients to improve the upper arm function

MSc. Samantha G. Rozevink[1], PhD Juha M. Hijmans[1], Prof. MD PhD Corry K. van der Sluis[1]
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B3. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction. In 80% of stroke patients the upper arm has limited function 6 months post-stroke. Robotic therapy can provide arm therapy for stroke patients and might be suitable for home use.

Objective. To improve the arm function of chronic stroke patients during 6 weeks of home training using MERLIN (robotic device with telerehabilitation platform).

Patients. Patients with unilateral paresis in the chronic phase of stroke with at least some upper limb function.

Methods. Patients trained 6 weeks at home with MERLIN, at least 3 hours per week. A pretest-posttest within subject design was used with measurements at 6 weeks pre-intervention (T0), at the start (T1), at the end (T2) and at 6 weeks post-intervention (T3). Primary outcome was the Wolf Motor Function Test (WMFT).

Results. Twelve patients were included, two patients dropped out due to problems with the device handling (hand too small) and personal reasons. A repeated measures ANOVA was performed based on intention to treat (Bonferroni corrected alfa = 0.008). Preliminary results showed that patients improved significantly on the WMFT between T0-T2 (p=0.006) with 5.3 points and between T1-T3 (p=0.004) with 4.6 points due to training with MERLIN. The patients who completed the training period trained on average 17.4 hours.

Discussion and conclusion. No serious adverse events related to MERLIN-treatment were reported. MERLIN was effective in improving arm function with lasting results up to 6 weeks after training.

Clinical message. Chronic stroke patients are able to improve arm function with intensive home-based robotic-assisted training, requiring minimal therapist supervision.

O6 Fatigue in relation to participation and health-related quality of life five years after perimesencephalic subarachnoid hemorrhage

Msc Lianne de Vries[1,2], PhD Wendy Boerboom[2], PhD Rita van den Berg-Emons[1], (MD) PhD Fop van Kooten[3], Prof. (MD) PhD Anne Visser-Meily[4,5], Prof. (MD) PhD Gerard Ribbers[1,2], PhD Majanka Heijenbrok-Kal[1,2]
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B3. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction: Nonaneurysmal perimesencephalic subarachnoid hemorrhages (PM-SAH) are often called benign SAHs. However, one third of patients with PM-SAH suffers from fatigue, which may interfere with participation and health-related quality of life (HR-QoL).

Objective: To examine the role of fatigue in participation and HR-QOL five years after PM-SAH.
Patients: Patients with PM-SAH.

Methods: Fatigue was assessed with the Fatigue Severity Scale (FSS), participation (frequency, restrictions, satisfaction) with the Utrecht Scale for Evaluation of Rehabilitation-Participation (USER-P), HR-QoL with the Stroke Specific Quality of Life scale (SS-QoL), and symptoms of depression and anxiety with the Hospital Anxiety and Depression Scale (HADS). Regression analyses were performed to examine associations of fatigue with participation and HR-QoL, adjusting for anxiety, depression and patient characteristics.

Results: On average 4.7 years (SD 1.6) post onset, 46 patients with PM-SAH were included, 63% male, with a mean age of 50.4 years (SD 9.4). Fifteen patients (33%) were fatigued (FSS≥4) and they had significantly worse participation ($p<0.01$) and HR-QoL ($p<0.001$) than non-fatigued patients. Fatigue severity was inversely associated with participation frequency ($B=-3.7$, $p<0.001$) and, independently of depression, with restrictions ($B=-3.1$, $p=0.005$) and satisfaction in participation ($B=-4.5$, $p=0.004$). More severe fatigue was associated with worse HR-QoL ($B=-0.2$, $p<0.001$), adjusted for anxiety.

Discussion and conclusions: Five years after PM-SAH, 33% of patients report fatigue and reduced participation and HR-QoL. Even after adjustment for depression and anxiety, fatigue is associated with participation and HR-QoL.

Clinical message: Rehabilitation programs aiming at fatigue, may improve participation and HR-QoL in the long term after PM-SAH.

O7 The relationship between relative aerobic load, energy cost and walking speed in stroke patients.

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B3. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction
Stroke patients can experience problems in participation because they generally walk slower than able-bodied individuals. While this lower speed might be attributed primarily to their motor control impairments, another contributing factor could be a mismatch between exercise capacity and aerobic load during walking.

Objective
To identify to what extent relative aerobic load impacts walking ability of stroke patients.

Patients
Forty stroke patients, subdivided in a more impaired (N=21; preferred walking speed (PWS)<0.8m/s) and less impaired (N=19; PWS >=0.8m/s) group, and 15 able-bodied individuals.

Methods
Participants performed five, 5-minute walking trials on a treadmill at 70%, 85%, 100%, 115% and 130% of their PWS, from which energy expenditure (EE, mlO2/kg/min) and energy cost (EC, mlO2/kg/m) were derived. Relative load was defined as EE divided by peak aerobic capacity (%VO2peak) and ventilatory threshold (%VO2-VT). Relative load and EC at PWS were compared between groups. The effect of speed on these parameters was modeled with GEE analyses.

Results
Stroke patients showed a higher relative load (50.2±14.4 and 51.7±16.8 %VO2peak) than able-bodied individuals (36.2±7.6 %VO2peak) at a lower PWS (0.76[0.19-1.43] vs 1.36[0.89-1.53] m/s) Furthermore, the more impaired group showed a higher EC than able-bodied individuals (0.30[.19-1.03] versus 0.19[0.10-0.24] mlO2/kg/m). GEE analysis showed that walking faster would reduce EC, but could result in a potentially unsustainable high relative load.

Discussion
A high relative aerobic load might limit stroke patients from walking faster and more economically.

Clinical message
When aiming to improve walking ability in stroke patients, it is important to consider training exercise capacity.

O8 Feasibility and effectiveness of gait training assisted by multi-channel functional electrical stimulation in early stroke rehabilitation: a randomized controlled trial

PT MSc Maijke Van Bloemendaal[1,2], PhD Sicco A. Bus[2], MD PhD Frans Nollet[2], MD PhD Alexander C.H. Geurts[3], PhD Anita Beelen[1,2,4]

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B3. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction. Many stroke survivors suffer from leg muscle paresis, resulting in asymmetrical gait patterns, negatively affecting balance control and energy cost. Interventions targeting asymmetry early after stroke may enhance recovery of walking.

Objective. To determine the feasibility and effectiveness of up to 10 weeks of gait training assisted by multi-channel functional electrical stimulation (MFES gait training) on the recovery of gait symmetry and walking capacity in patients early after stroke.

Patients. Forty adults (≤31 days after stroke) receiving inpatient rehabilitation.

Methods. The participants were randomized to MFES gait training (experimental group) or conventional gait training (control group). Gait training was delivered in 30-minute sessions each workday during inpatient rehabilitation. Feasibility was determined by adherence (≥75% sessions) and satisfaction with gait training (score ≥7 out of 10). Primary outcome for effectiveness was step length symmetry. Secondary outcomes included other spatiotemporal gait parameters and walking capacity (Functional Gait Assessment and 10-Meter Walk Test). Linear mixed models estimated treatment effect post-intervention and at 3-month follow-up.

Results. Thirty-seven participants completed the study protocol (19 experimental group participants). Feasibility was confirmed by good adherence (90%) and satisfaction (median score 8). Both groups improved on all outcomes over time. No significant group differences in recovery were found for any outcome.

Discussion and conclusions. MFES gait training was feasible but not superior to conventional gait training for improving step length symmetry or secondary outcomes early after stroke.

Clinical message. Our results do not seem to promote implementing MFES gait training as provided in this study.

O9 The effect of dance on self-esteem and quality of life in people with Parkinson's disease.

MD Msc Wya Feenstra[1], MD PhD Jorik Nonnekes[2], Msc Tahmina Rahimi[2], Msc PhD Heleen Reinders-Messelink[2,3], Prof. Pt PhD Pieter Dijkstra[3,4], Prof. MD PhD Bas Bloem[2]
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B4. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction
Dance has shown to be effective in improving motor symptoms in Parkinson's disease (PD). In line with our clinical experience, several studies also mention the potential effects of dance on psychosocial wellbeing, but this has been less studied.

Objective
To explore the effects of dance classes on self-esteem and quality of life in people with PD.

Patients
People with the diagnosis of idiopathic PD, who were enrolled in newly started dance classes of 'Dans op Recept'.

Methods
We included 49 patients, they participated in weekly dance classes for 22 weeks. Two baseline measurements were performed during a two-week control period prior to the dance classes. Post-tests were performed immediately after. Primary outcome: self-esteem (Rosenberg Self-Esteem Score) and quality of life (PDQ-39). Secondary outcome: confidence in motor functioning (ABC) and motor symptoms (UPDRS III).

Results
There was significant improvement in self-esteem (p=0.012), quality of life (p=0.003) and motor symptoms (p=0.002). Confidence in motor functioning did not change.

Discussion and conclusions
Our study results suggest that dance lessons are beneficial to self-esteem, quality of life and motor symptoms in patients with PD. In addition, this is the first study to report improved self-esteem after dance classes in PD. This may further be investigated using a randomized clinical trial.

Clinical message
Patients with PD experience dance as an enjoyable and engaging way of physical training. This study shows dance does not only improve motor symptoms, but also has a positive effect on self-esteem and quality of life. Shouldn't we dance more?

O10 THE EFFECT OF STANCE-CONTROL KNEE-ANKLE-FOOT-ORTHOSES ON WALKING SPEED, ENERGY EXPENDITURE AND SATISFACTION WITH WALKING IN POLIO SURVIVORS

MSc Bart Raijmakers[1], PhD Merel Brehm[1], MD, PhD Fieke Koopman[1], MD, PhD Frans Nollet[1]
[1]*Amsterdam UMC, University of Amsterdam, Department of Rehabilitation, Amsterdam Movement Sciences, Amsterdam, The Netherlands*

B4. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction
Stance control knee-ankle-foot-orthoses (SC-KAFOs) can be used in persons with quadriceps muscle weakness to reduce mobility problems such as knee instability, diminished walking speed and increased walking energy expenditure. So far, the efficacy of SC-KAFOs on improving mobility in polio survivors has hardly been evaluated.

Objective
To investigate the efficacy of SC-KAFOs on walking speed, walking energy expenditure and satisfaction with walking in polio survivors with quadriceps muscle weakness compared to walking with shoes only.

Patients
Twenty eight polio survivors (mean age 54 years) without prior KAFO experience provided with a SC-KAFO during clinical care participated.

Methods
Participants performed assessments before and at least 3 months after receiving the SC-KAFO. These included a six-minute comfortable walk test with ambulant registration of gas-exchange to assess walking speed and walking energy expenditure, and a questionnaire on satisfaction with walking.

Results
The mean (SD) walking energy consumption decreased significantly with 7% (-0.33 J/kg/min) while walking with the SC-KAFO (4.29 (0.99) J/kg/min) compared to shoes-only walking (4.62 (1.09) J/kg/min, $p=0.006$). No differences were found in walking speed and walking energy cost ($p\geq0.196$). Patients reported significant improvements on safety and stability during walking and walking satisfaction ($p<0.035$) while walking effort, stair climbing and fear of falling remained unchanged ($p>0.05$).

Discussion & conclusions
In polio survivors with knee instability due to quadriceps muscle weakness, SC-KAFOs decreased walking energy consumption and improved satisfaction of walking.

Clinical message
A SC-KAFO is a beneficial intervention to improve physical mobility in polio survivors with quadriceps muscle weakness.

O11 Identifying factors that determine the user's value of upper limb prostheses: a national survey study

MSc Nienke Kerver[1], PhD Paul F. M. Krabbe[1], PhD Sacha van Twillert[1], Carlijn J. Blekkink[1], Prof., MD, PhD Corry K. van der Sluis[1]
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B4. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction: Innovative upper limb (UL) prostheses are often idealized in the media, but the 'user's value' of these prostheses seems often limited. A high user's value requires a match between factors considered important by an individual and features that a prosthesis can offer.

Objective: To determine which factors regarding prosthesis use are considered most important by adults with UL defects.

Patients: Adults with major unilateral UL defects.

Methods: Based on a qualitative meta-synthesis and input from patients and health care professionals, an overview of 79 factors was created and subsequently integrated in an innovative digital tool using a graphical diagram. A total of 365 participants (mean age 55.7±16.6) selected their top 10 most important factors.

Results: Most selected factors were 'wearing comfort' (54.1% of cases), 'grabbing, picking up and holding' (34.6%), 'weight' (31.7%), 'independence' (30.5%), 'functionality' (29.1%) and 'life-like appearance' (26.7%). Women selected 'overuse complaints' (31.0%) and 'anonymity' (28.2%) more compared to the overall population; men 'ease of control' (27.7%); passive prosthesis users 'feeling comfortable' (23.6%) and 'anonymity' (30.7%); active prosthesis users 'reliability' (37.5%).

Discussion and conclusion: As expected, functional aspects were important to users (grabbing/holding). Surprisingly, prosthesis related factors (wearing comfort, weight) were also mentioned frequently. User subpopulations (gender, type of prosthesis) showed different focus areas.

Clinical message: Selected factors provide focus areas to select and evaluate UL prostheses in clinical practice. This information will be used to develop a tool to assess the 'user's value' of UL prostheses in order to perform a cost-effectiveness analysis.

O12 The socioeconomic burden of facioscapulohumeral muscular dystrophy

MD PhD Anna Zielman-Blokhuis[1,2], Hanneke Deenen[3], MD PhD Nicol Voermans[3], PhD Wietske Kievit[4], MD PhD Jan Groothuis[2]

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B4. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction: Facioscapulohumeral muscular dystrophy (FSHD) is the third most common inherited neuromuscular disorder. Several clinical trials in FSHD are currently executed. Evaluation of the cost-effectiveness of a new treatment requires knowledge on the societal costs of a specific disease.

Objective: To determine the socioeconomic burden of facioscapulohumeral muscular dystrophy (FSHD) from a societal perspective.

Patients/Methods: FSHD patients from the Dutch FSHD registry were invited to complete a questionnaire on medical consumption, work productivity and health-related quality of life (HR-QoL).

Results: A total of 172 patients completed the questionnaire (response rate 65%). The per-patient annual direct costs of illness were estimated to be €22,902, which is 5 times higher than the mean per-person health expenditures in the Netherlands. A considerable loss of productivity was observed in FSHD patients for both paid and voluntary work, calculated to account for €5,066 of indirect costs of illness per patient. HR-QoL was significantly reduced in FSHD patients compared to the general Dutch population with a median health index of 0.625. The monetary value of the loss in quality of life was estimated to be €14,528. Total socioeconomic burden was calculated to be €42,497 per FSHD patient per year.

Conclusions/Clinical message: We show that FSHD is associated with considerable direct and indirect socioeconomic costs. The results highlight the many different costs that come with this rare neuromuscular disease. These findings are important for health care decision makers and aids in the evaluation of the cost-effectiveness of intervention programs and novel therapies.

B5. Free paper sessie 4: paediatric & others

O13 Adherence to at-home infrared foot temperature monitoring in people with diabetes at high risk of ulceration

MD Freek J Rovers[1], PhD Jaap J van Netten[1], MD Tessa E Busch-Westbroek[1], MD Wouter B Aan de Stegge[1], PhD Sicco A Bus[1]
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B5. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction: At-home monitoring of foot skin temperature is an effective intervention in helping to prevent foot ulcer recurrence in people with diabetes. However, little is known about adherence to this intervention, including associated patient characteristics.

Objective: To investigate adherence to at-home monitoring of foot temperature and associated factors in at-risk people with diabetes.

Patients: Participants with diabetes, peripheral neuropathy and a history of foot ulceration in the preceding four years.

Method: Participants in the intervention arm of a multicenter RCT on temperature monitoring for ulcer prevention (DIATEMP) performed and logged daily at-home measurement of foot temperatures for 18 months or until ulceration (or death). Adherence was calculated as proportion of follow-up days covered (PDC), with participants classified as adherent when PDC>70%.

Results: Of 151 included participants, 93 participants (61.6%) were adherent (PDC>70%). Mean PDC was 64.8% (SD: 38.0). Adherence in the first 3 months was significantly higher than in months 4-18 (78.1% (n=118) vs. 57.2% (n=79); p<0.001). Almost no factors were significantly associated with adherence, nor with adherence in months 4-18. In the first 3 months, living together (p=0.034, OR=2.406) and higher age (p=0.021, OR=1.045) were associated with increased adherence.

Conclusion and Discussion: Adherence to foot temperature measurements was just above 60%, which is similar to other self-care interventions in people with diabetes. Participants were more adherent in the first 3 months, suggesting that adherence requires additional assessment and support after this period. We found limited specific characteristics associated with adherence, which hampers defining subgroups that require support.

O14 The relationship between the physical strain of walking and daily activity time in individuals with neuromuscular diseases.

MSc. Sander Oorschot[1], PhD Eric Voorn[1], PhD, MD Annerieke van Groenestijn[1], PhD, MD Frans Nollet[1], PhD Merel Brehm[1]

[1]*Amsterdam UMC, University of Amsterdam, Department of Rehabilitation, Amsterdam Movement Sciences, Meibergdreef 9, Amsterdam, The Netherlands., ,*

B5. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction. Physical strain of walking may be increased in individuals with neuromuscular diseases (NMD) and this could lead to reduced daily activity.

Objective. Investigating the physical strain of walking and its relationship with daily activity time.
Patients. Thirty-one adults with slowly progressive NMD.

Methods. Oxygen consumption during walking (VO_2walk), peak oxygen uptake (VO_2peak) during maximal cycle ergometry, and heart rate and step count during 7 consecutive days, were assessed. Physical strain was defined as VO_2walk expressed as percentage of VO_2peak. Daily activity time was expressed as average daily step count and time spent in moderate to vigorous physical activity (MVPA). Regression analyses assessed relationships between physical strain, VO_2walk, and VO_2peak with daily activity time.

Results. Physical strain during walking was 64% ± 15% and was inversely related to step count (r^2=.26, p=0.004), while VO_2peak was positively related to step count (r^2=.20, p=0.013) and inversely related to MVPA (r^2=.14, p= 0.040). The other relations were not significant.

Discussion and conclusions. Physical strain of walking is high in slowly progressive NMD, approximating vigorous exercise intensities. People with a higher physical strain take less steps daily. People with lower VO_2peak take less steps daily, while spending more time in MVPA. The small proportions of explained variance indicate that other factors likely play a role in daily activity.

Clinical message. Interventions aimed at reducing oxygen consumption of walking and/or increasing peak oxygen uptake may reduce the high physical strain of walking and improve daily life activity in slowly progressive NMD.

O15 Decision making and selection bias in four observational studies on Duchenne and Becker muscular dystrophy

MD Karin Naarding[1,2], PhD Nathalie Doorenweerd[3,4], MD Zaïda Koeks[1], MD, PhD Ruben Hendriksen[3], MD Kinita Chotkan[1], PhD Yvonne Meijer-Krom[2], MD PhD Imelda De Groot[2,5], MD, PhD Chiara Straathof[1], MD, PhD Erik Niks[1,2], PhD Hermien Kan[2,3]

[1]Department of Neurology, Leiden University Medical Center (LUMC), Leiden, The Netherlands, [2]Duchenne Center Netherlands, , The Netherlands, [3]C.J. Gorter Center for High Field MRI, Department of Radiology, LUMC, Leiden, The Netherlands, [4]John Walton Muscular Dystrophy Research Centre, Newcastle University and Newcastle Hospitals NHS Foundation Trust, Newcastle Upon Tyne, United Kingdom, [5]Department of Rehabilitation, Radboud University Medical Center, Nijmegen, The Netherlands

B5. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Natural history data are essential for trial design in Duchenne (DMD) and Becker (BMD) muscular dystrophy, but recruitment for observational studies can be challenging.

We reviewed reasons why patients or caregivers declined participation and compared characteristics of participants and non-participants to assess possible selection bias in three DMD and one BMD observational studies.

The three pediatric DMD studies focused on cross-sectional cognitive function and brain MRI (DMDbrain, n= 35, and DMDperfusion, n=12), and on longitudinal upper extremity function and muscle MRI (DMDarm, n=22). The adult BMD study assessed longitudinal muscle function (n=36).

Considerations for non-participation were retrospectively reviewed from screening logs. Characteristics of participants and non-participants were derived from the Dutch Dystrophinopathy Database and compared using Mann-Whitney U tests for age, travel-time, and age at loss of ambulation as marker for rate of disease progression (DMDarm and BMD study), and Fisher's exact test for DMD gene mutations ($p<0.05$).

The perceived burden of the protocol (38.2%), the use of MRI (30.4%), and travel-time to the study site (19.1%) were the most frequently reported considerations for non-participation. Overall, participating patients were representative of the studied sub-populations on the reviewed characteristics.

Optimizing the involvement of patients while designing protocols, improving the MRI experience, and integrating observational research and clinical care are all factors to address in order to facilitate and increase patient participation. Nationwide registries to recruit patients are essential for the comparison of participants and non-participants to ensure representative observational research.

O16 Participation and quality of life in children and young adults with acquired brain injury in a paediatric rehabilitation cohort: the patients' and parents' perspective.

Msc. Florian Allonsius[1], Dr. Arend de Kloet[1,3], Dr. Frederike van Markus[1], Dr. Jorit Meesters[1,2,3], Prof.dr. Thea Vliet Vlieland[1,2], Dr. Menno Van Der Holst[1,2]
[1]Basalt, The Hague / Leiden, The Netherlands, [2]Leiden University Medical Center, Leiden, The Netherlands, [3]The Hague University of Applied Sciences, The Hague, The Netherlands

B5. Free paper sessie, November 12, 2020, 4:50 PM - 5:50 PM

Introduction
Children and young adults may experience participation restrictions and diminished quality of life (QoL) after acquired brain injury (ABI). In rehabilitation practise outcomes on these domains are not measured structurally in patients and parents. Therefore, knowledge on outcomes, and whether patients' and parents' perspectives differ is lacking.

Objective/Patients
Describe participation and QoL and differences between patients' and parents' perspectives in patients with ABI (4-25 years) referred for multidisciplinary rehabilitation treatment.

Methods
Multicentre, cross-sectional study using the Child&Adolescent Scale of Participation (CASP parent and patient version (identical questions)) and PedsQL™Generic Core-4.0 (QoL parent and patient version (identical questions)) with total scores 0-100 (higher score-better functioning). Descriptive statistics were used and differences and agreement in perspectives (parent/patient) were investigated using Wilcoxon's test and intraclass-correlation-coefficients (ICC).

Results
Two-hundred-and-seven patients/parents completed the questionnaires. One-hundred-and-nine patients were female (53%) and 155 (75%) had traumatic brain injury. Median CASP total scores were 82.5, IQR:69-90 (patients) and 90.0, IQR:80-97 (parents). For QoL this was 65.2, IQR:54-78 and 59.8, IQR:48-75. Patients reported significantly more participation restrictions than their parents while they rated their QoL significantly higher ($p<0.05$). There was moderate agreement in participation outcomes (ICC:0.52) but relatively good agreement in QoL (ICC:0.67).

Discussion/conclusions
Participation restrictions and diminished QoL after ABI were reported by patients and parents with a significant difference in perspective, especially on participation.

Clinical message
Measuring participation and QoL after ABI in rehabilitation and taking into account differences in perspectives is essential to set/evaluate goals on rehabilitation's most essential outcome; participation in daily life.

Parallel sessie C

C1. Workshop: Developing and scaling-up innovative mobility solutions: how to contribute to and collaborate in a FieldLab ?
C2. Workshop: Chronic pain rehabilitation networks; collaborations between primary and specialist care
C3. Mini-symposium: Fatigue and fatigability - making the invisible visible: taxonomy, impact, assessment and treatment methods in diverse clinical populations
C4. Mini-symposium: Transfemoral protheses: state-of-the art and beyond. Recent developments in osseo-intgration, myoelectric control and powered prosthesis.
C5. Mini-symposium: Innovation in clinical practice: Implementation of a psychological screening in spinal cord injury rehabilitation
C6. Mini-symposium: Assessment and rehabilitation of visual disorders after acquired brain injury
C7. Mini-symposium: Home-monitoring and coaching in rehabilitation medicine: opportunities and challenges
C8. Mini-symposium: Innovating with a BIG and LOUD impact in Parkinson Rehabilitation: a road to functional recovery in daily life

C1 Developing and scaling-up innovative mobility solutions: how to contribute to and collaborate in a FieldLab ?

MD Ferrie Harberts[1], MSc Martijn van der Ent[3], Prof. Klaasjan Van Haastrecht[1], PhD Dick-Jan Zijda[2]
[1]Basalt, [2]Delft EHealth Academy , Delft, The Netherlands, [3]The Hague University of Applied Sciences, The Hague, The Netherlands

C1. Workshop: Developing and scaling-up innovative mobility solutions: how to contribute to and collaborate in a FieldLab ?, November 13, 2020, 9:05 AM - 10:05 AM

Approximately 26% of the 3.1 million persons aged over 65 in The Netherlands face limitations in their mobility and these numbers will grow over the coming years. Innovative solutions to improve mobility are warranted to optimize daily mobility and physical activity behaviour. Innovative solutions will thereby contribute to, improved outcomes and participation of rehabilitation care and reduction of caregiver's strain.

One of the main challenges in the innovation process is to connect the expertise of all stakeholders (e.g. patients and caregivers, healthcare professionals, researchers, students, ICT professionals, technicians and companies) to develop solutions with the highest potential for market-readiness and optimal outcomes. The FieldLab for Rehabilitation and Mobility (FieldLab R&M) aims to connect med-tech companies, knowledge institutions and health care providers to develop, test, apply, and scale-up innovative mobility solutions for commercial purpose. Projects can be brought into the FieldLab by a company/start-up (outside-in) or initiated from within health care (e.g. by a health care professional, i.e. inside-out).

Important prerequisites for a FieldLab are: the ability to speak and understand each other's language, interests and needs. These prerequisites are fundamental for developing future-proof innovations based on the latest technological insights.

Chair(s)
CHAIR: Klaasjan van Haastrecht, senior advisor Innovation, Basalt, Leiden and The Hague

Klaasjan works as senior advisor Innovation in Basalt Rehabilitation Centre and has 5+ years of experience in various innovation projects. Furthermore Klaasjan (co-)founded 3 LivingLabs in Rehabilitation care about home automation, exercise friendly rehabilitation centre and eRehabilitation.

CO-CHAIR: Dick-Jan Zijda, health care innovator and founder of the Delft EHealth Academy (DEHA), Delft
Dick-Jan has more than 15 years of experience in care innovation at local and regional level. Dick-Jan is the founder of the Delft EHealth Academy (DEHA). A learning network of all stakeholders (citizens, healthcare providers, knowledge institutions, entrepreneurs, municipalities) aimed at scaling up, implementing and securing digital applications within the primary process of healthcare providers and the society.

Ferry Harberts, rehabilitation physician, Basalt, Leiden and The Hague
Ferry works as rehabilitation physician in Basalt and has a special interest for innovation in health care.

Martijn van der Ent, MSc, The Hague University of Applied Sciences, Cue2Walk International
Martijn is an Integral Product Developer specialised in human-product-interaction. Both as an entrepreneur and entrepreneur he works on projects to create new business by innovation. Creating healthy business requires a strong value proposition and a healthy flow of resources.

Outline session

Objectives
This workshop will outline the setup of the sustainable FieldLab R&M within Basalt rehabilitation center, and afterwards participants will be able to:
Recognize the added value of a FieldLab R&M for innovative mobility solutions.
Acknowledge the importance of speaking and understanding each other's language, interests and needs.
Translate the perspective of different stakeholders into the objectives of the FieldLab process to achieve innovative mobility solutions.
Formulate relevant outside-in questions that can be addressed in the FieldLab R&M.
Take home the FieldLab methodology for use in their own setting.

Contents
A 1.5 hour workshop within the theme: ‘Innovative solutions to optimize mobility’:

Short introduction about FieldLab-RAM project (10’)
The FieldLab-RAM from the perspective of a rehabilitation physician, entrepreneur, innovator (20’)
Interactive session: how to contribute to and collaborate in a FieldLab (45’)
Wrap-up (15’)

Learning objective(s)
Objectives This workshop will outline the setup of the sustainable FieldLab R&M within Basalt rehabilitation center, and afterwards participants will be able to: • Recognize the added value of a FieldLab R&M for innovative mobility solutions. • Acknowledge the importance of speaking and understanding each other's language, interests and needs. • Translate the perspective of different stakeholders into the objectives of the FieldLab process to achieve innovative mobility solutions. • Formulate relevant outside-in questions that can be addressed in the FieldLab R&M. • Take home the FieldLab methodology for use in their own setting

C2 Chronic pain rehabilitation networks; collaborations between primary and specialist care

MD, PhD Vera Baadjoe[4], Dr. Ivan Huijnen[4], MSc Cynthia Lamper[1], Dr. ir. Wendy Oude Nijeweme[3], Prof. dr. Paul van Wilgen[2]

[1]Maastricht University, [2]Transcare and Vrije Universiteit Brussel, Groningen, The Netherlands, [3]University of Twente and Roessingh Research & Development (RRD), Enschede, The Netherlands,, [4]Maastricht University and Adelante, Maastricht, The Netherlands

C2. Workshop: Chronic pain rehabilitation networks; collaborations between primary and specialist care, November 13, 2020, 9:05 AM - 10:05 AM

In the Netherlands, 2 million patients experience musculoskeletal chronic pain. This has a considerable socio-economical impact caused by healthcare costs and work disability. There is a large interindividual variation of the impact of biopsychosocial factors on the patients' functioning and participation. Current healthcare organization for management of chronic pain is insufficient and inefficient. Often, a patient receives a large variety of treatments based on different frameworks and explanations for the pain problem. This time-consuming search, for often a solution for pain, repeatedly leads to disappointment. According to reports from the Taskforce 'De juiste zorg op de juiste plek' (2018) and the 'Zorgstandaard Chronische Pijn (2017)' an integrated biopsychosocial view, assessment and treatment is indicated. The workshop will explore initiatives, barriers and facilitators, and effectivity of organizing chronic pain rehabilitation networks. All presented networks in this mini-symposium contain elements of:

Transdisciplinary collaboration (within and between primary, secondary and tertiary care); lead to better understanding between healthcare professionals and a patient centered approach

Integration of the biopsychosocial view

Transparency in determination of complexity and referral of the patients to the right place based on the complexity of their complaints (Matched care).

Transparency of the treatment protocols.

Chair(s)
Chair: Dr. Ivan Huijnen, Adelante/Maastricht University
Ivan.huijnen@maastrichtuniversity.nl

Outline session
Program outline
5 min. Introduction: Dr. Huijnen
5- 25 min. Speaker 1: Prof. Dr. C. Paul van Wilgen (Transcare and Vrije Universiteit Brussel). Transdisciplinary care in chronic pain; a fundament for patient centered care
25- 45 min. Speaker 2: Dr. ir. Wendy Oude Nijeweme (University of Twente and Roessingh Research & Development (RRD)) The health journey and satisfaction of patients suffering from chronic pain in Twente.
45- 65 min. Speaker 3: Cynthia Lamper, MSc. (Maastricht University) Results of a transmural network in chronic pain: the Network Pain Rehabilitation Limburg
65- 85 min. Speaker 4: Vera Baadjou, MD PhD. (Maastricht University and Adelante) Specialist care in the primary care setting.
85-90 min. General discussion

Learning objective(s)
• Learn about examples of initiatives of organizing chronic pain rehabilitation in networks
• Learn about barriers and facilitators in starting and working in these networks.

C3 Fatigue and fatigability - making the invisible visible: taxonomy, impact, assessment and treatment methods in diverse clinical populations

Dra. Lieke Brauers[1], Elke Heremans[1], Dra. Kyra Theunissen[2], Dra. Fanny van Geel[1], Drs. Maarten van Herck[1]
[1]Hasselt University, Hasselt, Belgium, [2]Maastricht University, Maastricht, The Netherlands

C3. Mini-symposium: Fatigue and fatigability - making the invisible visible: taxonomy, impact, assessment and treatment methods in diverse clinical populations, November 13, 2020, 9:05 AM - 10:05 AM

Novel insights in fatigue and fatigability demonstrate that both are underestimated problems occurring in a large variety of pathologies. Despite their high prevalence and large impact on patients' participation, quality of life and ability to participate in rehabilitation programs, these symptoms are often overlooked and their consequences in rehabilitation are insufficiently understood. In the current session, we aim to summarize the literature on definitions, taxonomy, assessment protocols, outcome measures and interventions for fatigue and fatigability in the domains of walking biomechanics, neuromotor, cardiorespiratory and paediatric rehabilitation. The definitions and underlying factors of different types of fatigue and fatigability, including trait and state fatigue and cognitive and motor fatigability, are discussed throughout the session and an updated taxonomy is presented. An overview of the different assessment methods, currently used clinical tools and novel methods based on innovative technologies will be discussed. Finally, the scientific evidence regarding different types of interventions for fatigue and fatigability is summarized, highlighting the importance of multidisciplinary and multimodal treatment programs. Hereby, attention is paid towards the implementation of these methods in clinical care.

Chair(s)
Heremans Elke, PhD P.T., Research Expert Faculty of Rehabilitation Sciences, UHasselt
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Outline session
We bring together four experts from different domains, i.e. biomechanics, neuromotor, cardiorespiratory and paediatric rehabilitation. The speakers are experts in research on fatigue and fatigability in patients with multiple sclerosis (MS), rheumatoid arthritis (RA), cerebral palsy (CP), chronic obstructive pulmonary disease, asthma and osteoarthritis.

Programme:
1) Fatigue and fatigability: an updated taxonomy (14 min)
2) Impact and prevalence of fatigue and fatigability in adults and children (14 min)
3) Assessment of fatigue and fatigability: golden standard and innovative methods (14 min)
4) Combining novel methods for understanding the relationship between walking mechanics and fatigue (14 min)
5) Novel interventions for treatment of fatigue and fatigability (14 min)
6) Group discussion (20 min)

Speakers:

Fanny Van Geel (PhD researcher Hasselt University) is an expert on walking fatigability and related symptoms in persons with MS.
Maarten Van Herck (PhD researcher Hasselt University) investigates subjective fatigue in patients with lung diseases and the impact of rehabilitation upon fatigue.
Kyra Theunissen (PhD researcher Maastricht University & Hasselt University) focuses on the biomechanics and energetics of walking fatigability in persons with MS and RA.
Lieke Brauers (PhD researcher Maastricht University & Hasselt University) investigates motor fatigability in the upper limbs of children with CP.

Learning objective(s)
1) To clarify the definitions of different types of fatigue and fatigability and provide the audience with a clear taxonomy for future use in scientific research and clinical practice;
2) To give an overview of the different assessment methods for fatigue and fatigability and the reliability of the available measurement instruments, including the presentation of novel technological assessment methods;
3) To summarize novel evidence regarding fatigue and fatigability in the field of biomechanics and neuromotor, cardiorespiratory and pediatric rehabilitation;
4) To provide an overview of currently used and investigated treatment methods for fatigue and fatigability and their effectiveness

C4 Transfemoral protheses: state-of-the art and beyond. Recent developments in osseo-intgration, myoelectric control and powered prosthesis

PhD René Fluit[3], PhD Erik Prinsen[1], Prof MD PhD Johan Rietman[1], MD PhD Henk van de Meent[2]
[1]Roessingh Research and Development, [2]Radboud University Medical Center, Nijmegen, The Netherlands, [3]University of Twente, Faculty of Engineering Technology, Enschede, The Netherlands

C4. Mini-symposium: Transfemoral protheses: state-of-the art and beyond. Recent developments in osseo-intgration, myoelectric control and powered prosthesis, November 13, 2020, 9:05 AM - 10:05 AM

In recent years, substantial improvements have been made in the design of lower-limb prosthetics. The majority of this work is still in the research phase, but it is expected that these will transfer into daily clinical care in the foreseeable future. It is therefore of clinical importance to get an overview of the current state-of-the-art in research.

Most research endeavours are focussing on increasing the functionality and intuitiveness of lower-limb prosthetics. Functionality can primarily be improved by developing powered prostheses. These are able to generate energy and can provide push-off and active knee flexion. Intuitiveness can be increased by giving the user more direct control over the prosthesis. This can either achieved by using signals from the residual muscles to predict the activity that the user wants to perform. This information can then be used to control the prosthesis. Intuitiveness can also be increased by osseointegration. Attaching the prosthesis directly to the bone provides osseoperception as well as a direct way to move the prosthesis.

This workshop will provide an overview of the current state-of-the-art in lower-limb prosthetics as well as an overview of current advancements within research.

Chair(s)
Prof Hans Rietman, MD, PhD

Outline session
Introduction symposium and overview of current state-of-the-art
Chair: Prof. Hans Rietman, MD, PhD
15 min

Developments in osseo-integration for lower-limb prosthetics
Presenter: Henk van der Meent, MD, PhD
20 min

Development of myolectric control algorithms for a transfemoral prosthesis
Presenter 2: Erik Prinsen, PhD
20 min

Development of control algorithms for a powered tranfemoral prosthesis
Presenter 1: René Fluit, PhD
20 min

General discussion and questions

Chair: Prof. Hans Rietman, MD, PhD
15 min

Total 90 min

Learning objective(s)
- To obtain an overview of the current state-of-the-art in lower-limb prostheses.
- To obtain an overview of the state-of-the-art in osseointegration for lower-limb amputation.
- To understand how the use of myoelectric signals can improve the control of transfemoral prostheses.
- To understand how advanced control algorithm can improve the control of powered transfemoral prostheses.

C5 Innovation in clinical practice: Implementation of a psychological screening in spinal cord injury rehabilitation

MSc Heleen Kuiper[2], PhD Marcel Post[4], MSc Tijn van Diemen[3], PhD Christel van Leeuwen[1]
[1]Rehabilitation Centre De Hoogstraat, [2]UMC Utrecht / De Hoogstraat Rehabilitation, The Netherlands, [3]UMC Utrecht / De Hoogstraat Rehabilitation / UMCG / Sint Maartenskliniek, , The Netherlands, [4]UMCU / De Hoogstraat Rehabilitation / UMCG, The Netherlands

C5. Mini-symposium: Innovation in clinical practice: Implementation of a psychological screening in spinal cord injury rehabilitation, November 13, 2020, 9:05 AM - 10:05 AM

Topic: Spinal cord injury (SCI) is one of the greater calamities that can happen to a person, often leading to severe physical impairments and psychological distress. In two previous studies, we distinguished five distinct life satisfaction and mental health trajectories. These trajectories give professionals insight into how persons differ in their adaptation to SCI. The results of these studies suggest possibilities to predict long-term life satisfaction and mental health and to identify persons who might be considered for psychological treatment early in rehabilitation.

Relevance: In this workshop, we present the set-up of a psychological screening for persons with SCI in all Dutch rehabilitation centers specialized in SCI at the start of inpatient rehabilitation and at discharge.

Current status: To date, seven out of eighth centres continue the application of the screening as part of the psychological rehabilitation care. The eighth SCI-specialized rehabilitation centre is also planning to implement the screening. Based on the evaluation of the implementation, recommendations have been developed for further use of the screening among other patient groups.

Plan of action: To implement the psychological screening as usual care in persons with SCI during inpatient rehabilitation.

Chair(s)
Christel van Leeuwen, PhD 1, 2

1 Centre of Excellence for Rehabilitation Medicine, Brain Centre Rudolf Magnus, University Medical Centre Utrecht, Utrecht University and De Hoogstraat Rehabilitation, Utrecht, The Netherlands.

2 Department of Spinal Cord Injury and Orthopedics, De Hoogstraat Rehabilitation, Utrecht, the Netherlands

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Outline session
Author(s): Christel van Leeuwen, PhD 1, 2,Heleen Kuiper, MSc 1,3, Tijn van Diemen, MSc 1,3,4, Marcel Post, PhD 1,3

1 Centre of Excellence for Rehabilitation Medicine, Brain Centre Rudolf Magnus, University Medical Centre Utrecht, Utrecht University and De Hoogstraat Rehabilitation, Utrecht, The Netherlands.
2 Department of Spinal Cord Injury and Orthopedics, De Hoogstraat Rehabilitation, Utrecht, the Netherlands
3 University of Groningen, University Medical Centre Groningen, Centre for Rehabilitation, Groningen, The Netherlands
4 Sint Maartenskliniek, Department of Rehabilitation, Nijmegen, The Netherlands.

Marcel Post will describe the insights that have led to the current psychological screening in the Netherlands. Christel van Leeuwen will present the contents of the screening and the considerations for the choice of questionnaires. Heleen Kuiper will use data from the psychological screening to describe psychological factors and mood among persons with SCI at admission and discharge from inpatient rehabilitation. Tijn van Diemen will explain how the psychological screening is used in clinical practice. Which part of the psychological screening is used for treatment? What is interesting to know for team members? How are results communicated to persons with SCI?

Learning objective(s)
To implement the psychological screening as usual care in persons with SCI during inpatient rehabilitation.

C6 Assessment and rehabilitation of visual disorders after acquired brain injury

PhD Gera de Haan[4], PhD Christine Hazelton[3], PhD Joost Heutink[1], Prof. dr. Georg Kerkhoff[2]
[1]Department of Clinical and Developmental Neuropsychology, [2]Klinische Neuropsychologie Universität des Saarlandes, Saarbrücken, Germany, [3]Glasgow Caledonian University, Glasgow, United Kingdom, [4]University Of Groningen, Groningen, The Netherlands

C6. Mini-symposium: Assessment and rehabilitation of visual disorders after acquired brain injury, November 13, 2020, 9:05 AM - 10:05 AM

Due to the complexity of neurological disorders and the individual nature of impairments, neuropsychological rehabilitation after stroke, traumatic brain injury and other neurological diseases such as multiple sclerose is a challenging endeavor. First, disorders and the nature of impairments may vary from patient to patient. Second, since visual perception interacts with other cognitive functions, disturbances of the visual system have an effect on and are influenced by other functions. Third, disorders of visual function may take place at lower and/or at higher function levels and may vary from visual visual field defects and specific agnosias to non-specific visual complaints such as blurred vision or experienced alteration in contrast sensitivity.

In this mini-symposium recent developments on the assessments and rehabilitation options for this range of visual disorders are discussed in the light of recent studies and developments.

Chair(s)
G.A. (Gera) de Haan (1,2)
dr. J.H.C. (Joost) Heutink (1,2)

1. University of Groningen, department of Clinical and Developmental Neuropsychology
2. Royal Dutch Visio, Centre of Expertise for blind and partially sighted people

Outline session
PIONEER: a scoping review of interventions for perceptual problems in stroke
Christine Hazelton PhD (1)

Update on neurovision rehabilitation after acquired brain damage
Prof. Dr. Georg Kerkhoff (2)

Assessment and rehabilitation of specific and non-specific complaints in patients with ABI
Joost Heutink PhD (3,4)

Visual complaints and disorders in patients with multiple sclerosis
Gera de Haan PHD (3,4)

1. Nursing Midwifery and Allied Health Professions (NMAHP) Research Unit, Glasgow Caledonian University, Glasgow, UK
2.Klinische Neuropsychologie Universität des Saarlandes
3. Department of Clinical and Developmental Neuropsychology, University of Groningen, Groningen, The Netherlands
4. Royal Dutch Visio, Centre of Expertise for blind and partially sighted people, The Netherlands

Learning objective(s)
Getting acquainted about recent developments on the assessments and rehabilitation options for this range of visual disorders are discussed in the light of recent studies and developments.

C7 Home-monitoring and coaching in rehabilitation medicine: opportunities and challenges

PhD Anita Beelen[1], Dr. PhD Manon Dontje[1], Drs. MD Esther Kruitwagen van Reenen[1], MSc Pearl van Lonkhuizen[2], Prof. MD PhD Nico Wulffraat[3]

[1]UMC Utrecht, [2]Dept of Public Health and Primary Care, Leiden University Medical Center, [3]Wilhelmina Children's Hospital, University Medical Center Utrecht, Utrecht, The Netherlands

C7. Mini-symposium: Home-monitoring and coaching in rehabilitation medicine: opportunities and challenges, November 13, 2020, 9:05 AM - 10:05 AM

Telehealth models of care involving home-monitoring have shown clear benefits for patients with chronic disease while reducing unnecessary clinic visits. These models of care show promise in empowering patients to better manage their health and to participate in their care, thereby improving compliance with treatment and their satisfaction with care. Furthermore, they enable health care professionals to provide timely intervention and personalized care. Despite the increasing evidence of effectiveness of telehealth technologies obtained from small-scale studies, the adoption of telehealth solutions in rehabilitation remains limited. Benefits of home monitoring may apply to several diagnostic groups in rehabilitation medicine such as neuromuscular diseases, spinal cord injury, cerebral palsy and chronic pain disorder. Barriers that need to be overcome to achieve widespread adoption of telehealth include acceptance of this technology by patients and health care professionals, economically sustainable reimbursement systems and interoperability between electronic patient record systems. In this interactive mini-symposium we will introduce examples of currently used models of rehabilitation care based on home-monitoring with special focus on the scalability and sustainability of these care innovations. The audience will be invited to reflect on the opportunities and challenges of home-monitoring in rehabilitation populations to identify strategies to promote implementation and advance adoption of home-monitoring and coaching in rehabilitation medicine.

Chairs:
Esther Kruitwagen, MD, Rehabilitation specialist, Dept. of Rehabilitation, Physical Therapy Science & Sports, University Medical Center Utrecht
Anita Beelen, PhD, Senior Researcher Neuromuscular diseases, Dept of Rehabilitation, Physical Therapy Science & Sports, University Medical Center Utrecht

Program outline:
1. Introduction (Drs. Esther Kruitwagen, Dr. Anita Beelen)
2. Development of a European eHealth care model to improve quality of life in Huntington's Disease: a user-centered design study (Pearl van Lonkhuizen, MSc, Dept of Public Health and Primary Care, Leiden University Medical Center)
3. Nationwide implementation of ALS Home monitoring and Coaching (Manon Dontje, PhD, Dept of Rehabilitation, Physical Therapy Science & Sports, University Medical Center Utrecht)
4. Home monitoring by juvenile arthritis adolescents or parents using an App Reuma2Go. Can it be used to replace clinical visits? (Prof. Nico Wulffraat, MD PhD, Dept of Pediatric Rheumatology and Immunology, Wilhelmina Children's Hospital, University Medical Center Utrecht, Utrecht)
5. Reflection and discussion

Learning objectives:

At the end of the mini-symposium participants understand the value of care models based on home monitoring and recognize the challenges of promoting implementation and advancing adoption of home-monitoring in rehabilitation medicine.

C8 Innovating with a BIG and LOUD impact in Parkinson Rehabilitation: a road to functional recovery in daily life

Karina Crum-van Dijk[1], Willem Oudegeest[1], Alette Pooter-Westra[1]
[1]*Meander Medical Center, Amersfoort, The Netherlands*

C8. Mini-symposium: Innovating with a BIG and LOUD impact in Parkinson Rehabilitation: a road to functional recovery in daily life, November 13, 2020, 9:05 AM - 10:05 AM

Recent research has dramatically changed the insights on Parkinson's. It used to be seen as a neurodegenerative brain disease with merely motor symptoms due to loss of dopamine production in the substantia nigra with no possibility of functional recovery. Brain Research of Parkinson's have shown an important role for sensory-motor disorders in the basal ganglia, leading to microkinesia and hypophonia with specific complex impairments. To challenge these the broad multidisciplinary functional insight of Rehabilitation Medicine is needed in conjunction with medication to make the most of the neuroplasticity to fight the neurodegenerative disease.
As pioneer in Parkinson Rehabilitation in the Netherlands, Meander MC has successfully introduced an interdisciplinary short intense treatment aiming in restoring the amplitude affected due to microkinesia and hypophonia. In these treatments patients are taught to nominalize their movement and speech in daily life by increasing their amplitude with specific daily exercises. Research shows that patients not only improve during training, but are able to show improvement with the daily exercise even after the Rehabilitation has stopped. Given all these findings it's important that the knowledge on Rehabilitation Medicine of Parkinson's is shared to improve treatment for all patients with Parkinson's.

Chair(s)
Willem Jacob Oudegeest (1974-) is the leading consultant Physical Rehabilitation Medicine in the Netherlands for Parkinson Rehabilitation. He works in Meander Medical Center in Amersfoort the Netherlands, and is also President of the Workgroup Parkinson and related Movement disorders of the Netherlands Society of Rehabilitation Medicine and core member of the Parkinson Advisory Board of the Parkinson Association Netherlands. His aim is to continues improve Parkinson Rehabilitation by implementing the newest treatments and sharing his knowledge with patients and colleagues.

Outline session
30 minutes: New insights in Parkinson: basal ganglia and microkinesia. - WJ Oudegeest, physiast MeanderMC, Amersfoort.
30 minutes: BIG movements adressing microkinesia - A. de Pooter-Westra, physiotherapist Meander MC, Amersfoort.
30 minutes: LOUD voice adressing hypophonia - K.M. Crum-van Dijk, Speech therapist MeanderMC, Amersfoort.

Learning objective(s)
Understanding the new insights of Parkinson with a central role for the basal ganglia and microkinesia and hypophonia and knowing how to adress these in an interdisciplinary intense Rehabilitation treatment toe empower the patient to fight the neurodegenerative disease in their daily life.

Parallel sessie D

D1. Workshop: Palliative care and rehabilitation care for children with chronic conditions and disabilities: What are the boundaries?
D2. Workshop: The use of (social) media to become a rehabilitation physician with impact
D3. Mini-symposium: Gait analysis @ Roessingh Diagnostic Centre: Evidence and practical implications in rehabilitation after stroke
D4. Mini-symposium: HandbikeBattle: The summit is what drives us, but the journey and climb itself are what matters
D5. Mini-symposium: How to realize a breakthrough of digital assisted rehabilitation medicine?
D6. Mini-symposium: Towards novel solutions for ankle-foot orthotics optimization in clinical practice
D7. Mini-symposium: ReSpAct 2.0: Rehabilitation, Sports and Active lifestyle in 2020 and beyond, new questions to ask?!

D1 Palliative care and rehabilitation care for children with chronic conditions and disabilities: What are the boundaries?

Dr Mattijs Alsem[1], Dr. Hennie Knoester[1], Johannes Verheijden[2], Dr. Jeanine Voorman[3]

[1]Amsterdam UMC, [2]Netwerk Integrale Kindzorg, Utrecht, The Netherlands, [3]Wilhelmina Kinderziekenhuis/ UMC Utrecht, Utrecht, The Netherlands

D1. Workshop: Palliative care and rehabilitation care for children with chronic conditions and disabilities: What are the boundaries?, November 13, 2020, 11:00 AM - 12:00 PM

Due to increasing knowledge and possibilities of paediatric care, the number of children with chronic conditions and disabilities increases. In the Netherlands, there is more and more emphasize on palliative care e.g. in national networks and child comfort teams.

Moreover, in paediatric rehabilitation, a substantial number of children have a life-limiting disease, or have a condition that affects their life expectancy. Paediatric rehabilitation focusses on participation and quality of life of children with disabilities, whereas palliative care is defined as “the active total care of the child's body, mind and spirit, and also involves giving support to the family. It begins when illness is diagnosed, and continues regardless of whether or not a child receives treatment directed at the disease.”

With these developments, there is more and more overlap in the care in paediatric rehabilitation and the palliative care of children. Although the final outcome of palliative care and rehabilitation care differs, goals are similar, due to focus on quality of life and patient and family-oriented goals. In this workshop we will explore the boundaries of both disciplines and see where collaboration can be shaped and implemented.

Chair(s)
Dr. Mattijs Alsem

Outline session
Program:
Palliative Care and Paediatric Rehabilitation
Definitions: Rehabilitation care, Paediatric Palliative care, Terminal Care,

Clinical cases
What are paediatric comfort teams and paediatric terminal teams?
What do they do?
What could be the role of the paediatric rehabilitation team and/or physician in the terminal phase of children and their families?
What are the 'Netwerken Integrale Kindzorg'?

Discussion with the participants:
How can palliative care and rehabilitation care learn from each other?
Who can play which role in mutual patients and families?
Is it possible and efficacious that the rehabilitation physician plays an active role in the terminal phase of children and families that are under rehabilitation treatment?
When should the rehabilitation physician transfer the treatment toward the palliative care team?
Who has the lead in the treatment of children and families in the palliative and/or the terminal phase of the treatment?

Learning objective(s)
- To discuss the role of paediatric rehabilitation teams in palliative care
- To discuss how the disciplines can learn from each other
- To learn about the expertises of palliative care teams and rehabilitation care teams

D2 The use of (social) media to become a rehabilitation physician with impact

Prof. MD PhD Jan Willem Gorter[4], MD Inez van der Ham[3], MD PhD Ilse van Nes[2], Dr. Nicole Voet[1]
[1]Rehabilitation centre Klimmendaal and Radboud University Medical Center, the Netherlands [2]St Maartenskliniek, Nijmegen, The Netherlands, [3]Rijndam Revalidatie, Rotterdam, The Netherlands, [4]McMaster University, Hamilton, Canada

D2. Workshop: The use of (social) media to become a rehabilitation physician with impact, November 13, 2020, 11:00 AM - 12:00 PM

(Social) media allows (rehabilitation) physicians to connect with the world, to share their opinion on medical developments, healthcare policy, and to present a personal perspective. It doesn't take away the place of traditional communications, for example medical journals or magazines. Instead (social) media allow for new opportunities, expanding the reach, and it often meets different objectives: you can exchange information, give your opinion or interact with others. Those physicians, researchers and other professionals in rehabilitation who have recognized the emerging role of social media have become influencers– to the benefit of all of us. The reach of social media can be large, and therefore impactful. Everyone who uses social media has to check the credibility of the source information as no disclaimers or conflict of interest are provided on media such as twitter or instagram. Social media can be intimidating to physicians and we realize that some rehabilitation physicians may have' cold feet' to get started. We hope to share with you that social media provides opportunities for patient engagement and spreading the word about our beautiful profession. In the end it is up to you to choose whether it's time to tune in!

Chair(s)
Nicole Voet, MD PhD rehabilitation physician
Rehabilitation center Klimmendaal, Arnhem and Radboud University Medical Centre, Nijmegen, the Netherlands

Ilse van Nes MD PhD rehabilitation physician
Rehabilitation center St Maartenskliniek Nijmegen, the Netherlands

Inez van der Ham, MD, rehabilitation physician
Rijndam Revalidatie Rotterdam, the Netherlands

Prof. Jan Willem Gorter, MD PhD, rehabilitation physician, Director of the CanChild Centre for Childhood Disability Research, McMaster University Hamilton, Canada, visiting professor University Medical Centre Utrecht, the Netherlands.

Outline session
A short introduction on using (social) media as an influencer and user. Speaker: Nicole Voet (20 minutes)
How can we use (social) media to promote our profession? Inez van der Ham and Jan Willem Gorter (40 minutes)
Personal experiences: the use of (social) media for the exposure of our medical profession. Speaker: Ilse van Nes (30 minutes)

Learning objective(s)
During this workshop we would like to share our personal experiences and learning with the use of social media (Twitter, Instagram, Facebook and Linked-In) and the use of other media (television, documentaries). 1. Learn how to become a rehabilitation physician with impact using (social) media 2. Learn how to search for quality information on (social) media

D3 Gait analysis @ Roessingh Diagnostic Centre: Evidence and practical implications in rehabilitation after stroke

MD PhD J.F. Fleuren[2], MD PhD M.J. Nederhand[2], PhD C. Nikamp[1], PT M.J. Tenniglo[2]
[1]Roessingh Research and Development / University of Twente, the Netherlands [2]Roessingh Centre for Rehabilitation / Roessingh Research and Development, Enschede, The Netherlands

D3. Mini-symposium: Gait analysis @ Roessingh Diagnostic Centre: Evidence and practical implications in rehabilitation after stroke, November 13, 2020, 11:00 AM - 12:00 PM

Improvement of walking ability is an important functional target of rehabilitation post-stroke. In clinical practise, gait analysis and EMG-measurements are important tools as they provide clinicians with objective data about individual walking patterns and effects of treatments aiming to improve walking. As such, they are essential in decision-making, for example with respect to non-reversible surgical interventions. This symposium will combine knowledge from different research-projects targeting improvement of walking ability post-stroke with clinical examples of gait analysis and EMG-measurements.

The symposium starts with a recent study about treatment options for stiff knee gait post-stroke. Effects of different treatment options are presented: electrical stimulation of the hamstring; botulinum-toxin injections in the rectus femoris; and rectus femoris transfer.

Second, a study on effects of AFO-provision is presented. Early AFO-provision resulted in functional improvements, without affecting limb kinematics or muscle-activity of the affected limb. Recently, the contribution of the unaffected limb to post-stroke gait was studied and results are presented.

Finally, preliminary results of a study on surgical corrections of the equinovarus foot deformity are presented. Subjects underwent a standard surgical intervention (Split Tibialis Anterior Tendon Transfer, SPLATT), which was evaluated using instrumented gait analysis (Vicon LowerBody Plug-in Gait with additional ankle- and foot-models).

Chair(s)
Chair: M. Nederhand, MD, PhD

Outline session
For the outline of the session, please also see the abstract.

Programme:

Introduction of the symposium
Chair: M. Nederhand, MD, PhD
5 min

Treatment options for stiff knee gait in stroke patients.
Presenter 1: M. Tenniglo, PT
20 min + 5 min questions

Ankle-foot orthoses after stroke: What about the contribution of the unaffected lower limb to the gait pattern?
Presenter 2: C. Nikamp, PhD
20 min + 5 min questions

Preliminary results after surgical intervention in patients with an equinovarus foot deformity following stroke
Presenter 3: J. Fleuren, MD, PhD
20 min + 5 min questions

General discussion and questions
Chair: M. Nederhand, MD, PhD
10 min

Total 90 min

Learning objective(s)
Learning objectives: 1) To acquire knowledge about different treatment options of stiff knee gait after stroke 2) To understand the effect of AFO-provision after stroke on gait kinematics of the unaffected lower limb 3) To get insight in the possible effects of soft tissue surgery on walking ability after stroke

D4 HandbikeBattle: The summit is what drives us, but the journey and climb itself are what matters

PT Rogier Broeksteeg[3], Sonja de Groot[1], Ingrid Kouwijzer[2], MD PhD Rutger Osterthun[3], OT PhD Linda Valent[2]
[1]Reade, center for rehabilitation & rheumatology, the Netherlands [2]Rehabilitation center Heliomare, Wijk Aan Zee, The Netherlands, [3]Rehabilitation Center Rijndam, Rotterdam, The Netherlands

D4. Mini-symposium: HandbikeBattle: The summit is what drives us, but the journey and climb itself are what matters, November 13, 2020, 11:00 AM - 12:00 PM

Handcycling is getting more popular for mobility and sports. Handcycling is more energy efficient and leads to less shoulder load compared to wheelchair propulsion. Therefore, handcycling is introduced during and after rehabilitation to stimulate a healthy lifestyle in people with a lower-limb disability.

One of the initiatives to stimulate a healthy lifestyle via handcycling is the HandbikeBattle, a yearly organized handcycling mountain race among 12 Dutch rehabilitation centers with teams of former patients. The goal of the HandbikeBattle is to challenge former patients to start training for this demanding climb (20 km, 1000m elevation) and to become mentally and physically fit. Several aspects have to be considered when starting such a physical challenge. One of them is a thorough medical screening and medical support during the HandbikeBattle. Furthermore, like in daily life, it is important to have an optimal training program to improve fitness but prevent overuse injuries in this frail population. Lastly, it is important to evaluate whether participating in the HandbikeBattle indeed leads to the positive mental and physical changes that are strived for. This mini-symposium provides an overview of the HandbikeBattle project as a healthy lifestyle intervention: from idea to implementation and evaluation.

Chair(s)
Sonja de Groot PhD, Reade, center for rehabilitation & rheumatology, Amsterdam. Department of Human Movement Sciences, Faculty of Behavioural and Movement Sciences, Vrije Universiteit, Amsterdam, the Netherlands. Email: s.d.groot@reade.nl

Linda Valent, OT, PhD, Rehabilitation center Heliomare, Wijk aan Zee, the Netherlands. Email: l.valent@heliomare.nl

Outline session
- Opening and introduction to the HandbikeBattle (~10 min)
Linda Valent OT, PhD, Rehabilitation center Heliomare, Wijk aan Zee, the Netherlands

-Medical screening, preparation and medical support during the HandbikeBattle (~15 min + 5 min discussion)
Rutger Osterthun MD, PhD, Rehabilitation Center Rijndam, Rotterdam, the Netherlands

-How to train vulnerable people with a lower-limb disability safely and effectively (~15 min + 5 min discussion)
Rogier Broeksteeg PT, Rehabilitation Center Rijndam, Rotterdam, the Netherlands

-Physical fitness and health effects of participating in the HandbikeBattle (~15 min + 5 min discussion)
Sonja de Groot PhD, Reade, center for rehabilitation and rheumatology, Amsterdam. Department of Human Movement Sciences, Faculty of Behavioural and Movement Sciences, Vrije Universiteit, Amsterdam, the Netherlands

-Quality of life and long-term effects of participating in the HandbikeBattle (~15 min + 5 min discussion)
Ingrid Kouwijzer MD, MSc, Rehabilitation center Heliomare, Wijk aan Zee. Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen

Learning objective(s)
• What are the medical challenges regarding screening and supporting former rehabilitation patients to the finish of the HandbikeBattle?
• How to train vulnerable people with a lower-limb disability safely and effectively?
• What are the physical and mental effects of participating in such a physical challenge?

D5 How to realize a breakthrough of digital assisted rehabilitation medicine?

Jessica Varkevisser, Judith Vloothuis

D5. Mini-symposium: How to realize a breakthrough of digital assisted rehabilitation medicine?, November 13, 2020, 11:00 AM - 12:00 PM

Digital treatment in medicine is increasing due to the growing possibilities of e-health and digital capacities of patients. There are several initiatives within rehabilitation but implementation in the rehab-programs remains scarce and diverse. The COVID-19 crisis has moreover proven the urge for rehabilitation to move forward on this field.

Blended care is a form of treatment in which patients use digital means combined with face-to-face meetings with therapists and seems to suit the rehabilitation practice well.

This mini symposium organized by the workgroup E-health of the VRA has the objective to
1) Present the vision of the workgroup about implementing blended care in daily rehabilitation care
2) exchange experiences with blended care

Chair
Workgroup E-health

Outline session
*The future of E-health in rehabilitation medicine – advice of the workgroup E-health
Jessica Varkevisser
*How to organize digital group sessions and lessons learned
*Patient experience with e-health

D6 Towards novel solutions for ankle-foot orthotics optimization in clinical practice

Dr. M. Brehm[1], Prof. MD PhD F. Nollet[1], Drs. MSc N.F. Waterval[1]
[1]*Amsterdam UMC - Academic Medical Center, the Netherlands*

D6. Mini-symposium: Towards novel solutions for ankle-foot orthotics optimization in clinical practice, November 13, 2020, 11:00 AM - 12:00 PM

People with neuromuscular disorders often experience walking limitations due to impaired calf muscle strength. Ankle-foot orthoses (AFOs) can be used to augment walking ability – for example to prevent falls or to reduce walking energy cost. For each user, though, the stiffness of the AFO will need to be individually optimized to achieve the best treatment outcome. We have coined this as Precision Orthotics. An opportunity of this approach is that it may lead to improvement of treatment outcome, i.e. substantially benefitting mobility for the individual patient. In this mini-symposium, we will demonstrate the clinical benefits of precision orthotics using walking energy cost and instrumented gait analysis as optimization metrics. Furthermore, we will highlight current state-of-the-art in human-in-the-loop optimization and simulation-based stiffness optimization of AFOs as future directions for implementation in clinical practice

Chair(s)
Symposium organisor: M. Brehm, PhD, m.a.brehm@amsterdamumc.nl, 020-5663669
Symposium chair: F. Nollet, MD PhD, f.nollet@amsterdamumc.nl

Outline session
lecture 1: Treatment with ankle-foot orthoses in calf muscle weakness: clinical perspective (by F. Nollet - 15 min)
lecture 2: Stiffness optimization of ankle-foot orthoses to maximize treatment outcome (by M.A. Brehm - 20 min)
lecture 3: Human-in-the-loop optimization of ankle-foot orthoses (by N.F. Waterval - 20 min)
lecture 4: Towards simulation-based optimization of orthoses (by J. Harlaar (speaker to be invited) - 20 min)
Closure : Plenary discussion (15 min)

Learning objective(s)
To provide a knowledge base of ankle-foot orthosis prescription in neuro-rehabilitation and show how optimization of AFO stiffness can be implemented in the future clinical practice using innovative techniques

D7 ReSpAct 2.0: Rehabilitation, Sports and Active lifestyle in 2020 and beyond, new questions to ask?!

PdD student MSc Pim Brandenbarg[1], Rienk Dekker[1], Prof. PhD Florentina Hettinga[3], Postdoc PhD Femke Hoekstra[2], MSc Bregje Seves[1], Lucas van der Woude[1]

[1]University Medical Center Groningen, University of Groningen, the Netherlands, [2]University of British Columbia, Kelowna, Canada, [3]University of Northumbria, Newcastle, United Kingdom

D7. Mini-symposium: ReSpAct 2.0: Rehabilitation, Sports and Active lifestyle in 2020 and beyond, new questions to ask?!, November 13, 2020, 11:00 AM - 12:00 PM

A physically active lifestyle is important for functioning, health and well-being, especially in those with a disability. This has been recognized integrated in many rehabilitation programs. ReSpAct 2.0 is an observational cohort study on the evaluation of the physical activity stimulation program Rehabilitation, Sports and Exercise (RSE) up to 5-7yrs post rehabilitation. The RSE program is successfully implemented in over 30 rehabilitation centers and hospital departments in the Netherlands. The ReSpAct 2.0 study evaluates the diversity in self-reported physical activity (PA) among ~1700 participants. Variation in PA in daily life, work, recreation or sports, among persons with different disabilities, and over time are studied and addresses the role of modifiable/non-modifiable determinants of PA. Special attention is focused on perceived fatigue in association with PA.

Also, the construct of PA among people with disabilities is studied for different measurement tools, perception, and cultural environment. Activity monitors have not been re-calibrated for energy cost and/or movement behaviors of those with disabilities. Energy estimates of questionnaires have still not been re-calibrated for differently perceived behaviors or actual energy costs of disabled individuals. The multinational ReSpAct research group presents different approaches towards PA stimulation and its outcomes in rehabilitation context/culture.

Chair(s)
Prof Rienk Dekker, Department of Rehabilitration Medicine, University Medical Center Groningen
Prof Lucas HV van der Woude, Center for Human Movement Sciences, University Medical Center Groningen, University of Groningen

Outline session
Chairs: Rienk Dekker, Luc van der Woude
2 min, Rienk Dekker & Luc van der Woude, Introduction
13min, Pim Brandenbarg & Leonie Krops, Diversity in physical activity among people with a physical disability in the Netherlands
13min, Bregje Seves, Trynke Hoekstra, Perceived fatigue and physical activity in persons with a stroke
13min, Femke Hoekstra, Floor Hettinga & Bregje Seves, Physical activity stimulation in the rehabilitation context of Canada, the UK and the Netherlands
13min, Pim Brandenbarg, Femke Hoekstra, Leonie Krops, The physical activity construct a critical assessment of measurement variability.
Discussion 6 min

Learning objective(s)
Role of physical activity among persons with physical activity Importance of understanding the construct 'Physical activity' Variation in physical activity over time, different contexts & cultures.

Poster presentaties

Top 8 posters

P1. The effectiveness of a comprehensive eRehabilitation intervention alongside conventional stroke rehabilitation: a pre-test post-test comparison - Jorit Meesters
P2. Ikoefenzelf.nl, implementing an online portal for stroke eRehabilitaton - Felicie van Vree
P3. Compensatory Reading Training for People with Homonymous Visual Field Defects – a Randomized Controlled Trial Protocol - Sarah Tol
P4. Scanning behavior in hemianopia: The Next Step - Josephien Jansen
P5. App library for rehabilitation - Liesbeth van der Wal
P6. Specialized orthotic care to improve functioning in adults with neuromuscular diseases: study protocol - Elza van Duijnhoven
P7. Visualisation of in-socket residual bone movement using B-mode ultrasound in a patient with a transtibial prosthesis - N Jonkergouw
P8. Production, strength testing and clinical research on low-cost 3D-printed transtibial prosthetic sockets for in rural areas - Merel van der Stelt

Overige posters

P9.How do people after stroke adapt step parameters and margins of stability at different walking speeds? - Laura Hak
P10. Long-term outcomes of reconstructive upper extremity surgery in spinal cord injury (SCI) patiënts with tetraplegia and the influence of spasticity - Anne Lenferink
P11. Visual complaints and disorders in patients with multiple sclerosis - Fleur van der Feen
P12. Re-learning motor abilities during arm-hand rehabilitation: The quest to speed up arm-hand performance in stroke survivors with a moderately to severely affected arm-hand - Johan Anton Franck
P13. Paid work and (satisfaction with) participation among stroke patients who were in paid work before stroke - a prospective cohort study - Winke van Meijeren-Pont
P14. Breinstraat facilitation of digital peer to peer expertise for children and young adults with acquired brain injury - Arend van Koet
P15. Transparency in pain rehabilitation by unraveling working mechanisms for chronic musculoskeletal pain - Ine Telgenkamp
P16. Energy cost of walking in people with a lower limb amputation: a systematic review and meta-analysis - Sanne Ettema
P17. Individual response to motor network transcranial direct current stimulation as alternative to unihemispheric stimulation - Joris van der Cruijsen
P18. Virtual reality in treatment of chronic pain; an explorative outcome study - Lisanne Tilma
P19. Added-value of spasticity reduction to improve arm-hand skill performance in sub-acute stroke patients with a moderately to severely affected arm-hand - Johan Franck
P20. Functional capacity of individuals with brachial plexus injury - Tallie van der Laan
P22. The Shoulder Elbow Perturbator (SEP): a single device to quantify post stroke motor impairments of the elbow - Levinia van der Velden
P23. Three-D-freehand ultrasound technique of the medial gastrocnemius muscle belly volume in stroke patients and healthy subjects: a pilot study - Sofie Leunis
P24. Predictors for caregiver strain, quality of life and emotional wellbeing of caregivers of patients after a cardiac arrest - Marjolein van Wijnen
P25. Parenting a child with Marfan syndrome: distress and everyday problems - Jessica Warnink-Kavelaars
P26. Measurement properties of patient-reported outcome measures within chronic musculoskeletal pain: a mapping review - L. Beckers
P27. Long-standing multidisciplinary program of aftercare for patients with spinal cord injury, reduces secondary health problems and burden of disease with improvement of QoL - Helma

Bongers-Janssen
P28. EEG correlates of motor learning in healthy subjects during a sequential visual isometric pinch task - Joris van der Cruijsen
P29. Implicit and explicit methods of instruction in dance classes and group physiotherapy sessions for patients with Parkinson's disease - Jorine Schoenmaker
P30. Modified Constraint Induced Movement Therapy, how does it look like and what are the effects? - Rinske Nijland
P31. eHealth in times of Corona; The corona crisis increases the sense of urgency for Remote Care (eHealth): how to make sustainable choices? - Klaasjan van Haastrecht
P32. Increasing velocity-dependent reflexes over weight-support levels can be used to quantify spasticity around the elbow in stroke patients - Bram Onneweer
P33. A practical and evidence-based framework for clinical rehabilitation management of the shoulder at risk - Johan Franck
P34. Identification of specific gait patterns in Hereditary Spastic Paraplegia (HSP) using visual gait assessment as a guide for treatment decisions - Meagen Renskers
P35. Custom-made footwear for indoor use increases short and long-term adherence in people with diabetes at high ulcer risk - Renske Keukenkamp
P36 Development of a remote handling concept-based task-oriented arm training in stroke: a pilot study - Jule Elmanowski
P37. Walking adaptability in polio survivors: a comparison with healthy age-matched individuals - Jana Tuijtelaars
P38. Patient perspectives on risk factors for musculoskeletal complaints in a population with upper limb absence - Anneliek Peters
P39. A LivingLab to develop New Interventions in a Clinical Environment for Active Living and Lifestyle (NICE4ALL) - Jorit Meesters
P40. Measuring self- regulation as rehabilitation outcome: What is important? - Tanja Ingeborg Mol
P41. Investigation of bias due to loss of participants in the HandbikeBattle: Understanding the reasons for dropping out - M Palsma
P42. Characteristics of aerobic and resistance exercise during rehabilitation of patients with acquired brain injury - K Gerrits
P43. Are self-reported red flags valid screeners for specific spine pathology in patients with chronic low back pain in tertiary care? - R Benedictus
P44. ActiFeeT: Lessons to be learned from a Pilot Study on a Biopsychosocial Rehabilitation Treatment in patients with Painful Diabetic Neuropathy - C. van Laake-Geelen
P45. Does it stop with improved function? Well prepared home! A study into the generalization of learned communication skills into everyday situations in aphasia - M. Joosen
P46. Duloxetine in osteoarthritis (doa) study: effects of duloxetine on pain and function in end-stage hip and knee OA – a pragmatic enriched randomized controlled trial - T. Blikman
P47. Effectiveness of cognitive behavioral therapy - module addressing the role of the social environment - on perceived social support in fatigued patients with multiple sclerosis - J. Hesse-van der Meer
P48. Musculoskeletal complaints in patients with major congenital longitudinal upper limb differences - M. Koenis
P49. Assessing Central Sensitization in patients with Chronic Low Back Pain; comparing Quantitative Sensory Testing, Heart Rate Variability and Central Sensitization Inventory - L. Huisman
P50. Non-pharmacological Treatments And Effectiveness On SCI-related Pain. A Cross-sectional Survey Study In Persons With a Spinal Cord Injury, living In The Netherlands - T. Crul
P51. Neuropathic pain in spinal cord injury and its evolution in time - J. Schuttevaar-Snijders
P52. What do I miss?? – Extrapersonal neglect at the GRAIL, a feasibility study - N. van Schijndel

P01

The effectiveness of a comprehensive eRehabilitation intervention alongside conventional stroke rehabilitation: a pre-test post-test comparison

MSc Berber Brouns[1,2], PhD Leti van Bodegom - Vos[3], PhD Arend de Kloet[1,2], PhD Sietske Tamminga[1], Gerard Volker[1], PhD Monique Berger[2], PhD Marta Fiocco[3], PhD, MD Paulien Goossens[4], Prof. Thea Vliet Vlieland[1,3], PhD Jorit Meesters[1,2,3]

[1]Basalt, The Hague, The Netherlands, [2]The Hague Universtiy of Applied Sciences, The Hague, The Netherlands, [3]Leiden Universtiy Medical Center , Leiden, The Netherlands, [4]Merem medical rehabilitation, Hilversum, The Netherlands

Poster pitches top 8 posters / poster sessie, November 12, 2020, 4:05 PM - 4:45 PM

Introduction: The effectiveness of combinations of eHealth applications (i.e. comprehensive eRehabilitation) in stroke rehabilitation is largely unknown.

Objective: This study assessed the effectiveness of a comprehensive eRehabilitation intervention (Fit After STroke @home; FAST@home) delivered alongside conventional stroke rehabilitation.
Method/patients: Pre-post design, comparing outcomes of stroke rehabilitation in two periods: conventional rehabilitation only (control group; CG) and comprehensive eRehabilitation in addition (intervention group; IG). FAST@Home is a web-portal comprising a tailored combination of commercially available eHealth applications for cognitive/physical exercises, activity-tracking and stroke-related psycho-education. Primary outcomes: eight sub-domains of the Stroke Impact Scale (SIS) at admission (T0), and three and six months thereafter (T3, T6). MANOVA compared change scores between CG versus IG for T0-T3 and T3-T6. To account for repeated measures a linear mixed model (LMM) was estimated. Analyses adjusted for age and inpatient/outpatient rehabilitation.

Results: One-hundred-and-fifty-three (mean age 58.6 (SD12.4), 97 (63%) males) and 165 (mean age 62.6 (SD10.5), 103 (62%) males) patients were included in the CG and IG, respectively. In the IG, 82 (50%) patients received the intervention, of whom 54 (66%) actually used it. A favourable effect for the IG was found between T3-T6 for the SIS Communication (p=0.026), Hand function (p=0.03) and Physical strength (p=0.010). No significant differences between T0-T3 nor between T0-T6 (LMM) were found for SIS subscales.

Discussion/conclusions: Two-thirds of the patients who were offered eRehabilitation used it. Compared with conventional rehabilitation, IG showed greater improvements between T3-T6 in several domains.

Clinical message: FAST@Home alongside conventional stroke rehabilitation may contribute to better outcomes.

P02

ikoefenzelf.nl, implementing an online portal for stroke eRehabilitaton

Drs.ir. Felicie Van Vree[1], MNR Sander Houdijk[1], Dr. Jorit Meesters[1,2]
[1]Basalt, Leiden/Den Haag, Netherlands, [2]LUMC, Leiden, Netherlands

Poster pitches top 8 posters / poster sessie, November 12, 2020, 4:05 PM - 4:45 PM

Rehabilitation centre Basalt developed a portal (ikoefenzelf.nl) for online stroke rehabilitation. The portal offers patients blended care applications for both physical and cognitive/mental training. After logging into the portal (SSO) patients can start their online training tailored by their rehabilitation professional(s). The portal will be used by at least 50% of all stroke patients of Basalt. Two physiotherapy institutes are involved to facilitate the optimum transfer to primary care. Furthermore the healthcare insurance company is involved to develop standards for reimbursement of eRehabilitation.

Structured and blended use of eRehabilitation for stroke patients is still scarce. In a previous project (FAST@HOME) a 1.0 version of the portal was developed and evaluated. Based on the results of this project ikoefenzelf.nl aims to increase the use of eRehabilitation and scale-up the 2.0 version of portal. Ikoefenzelf.nl enables patients to exercise where, when and how often as they want. More exercising will contribute to more participation and a higher quality of life.

In April 2020 four teams of Basalt are fully trained for the use of the portal. A comprehensive implementation plan is available to fully integrate the portal in the care process and the health professionals' daily practice. A set of online patient reported outcome measurements is administered to evaluate the implementation process and outcomes of the portal.

In the coming months the other six specialized teams will start the implementation trajectory. Subsequently, training and implementation in primary care will start. Finally, a cost analysis will be conducted.

P03

Compensatory Reading Training for People with Homonymous Visual Field Defects – a Randomized Controlled Trial Protocol

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Homonymous visual field defects (HVFDs) are a common consequence of damage to postchiasmatic brain areas. Up to 80% of people with HVFDs may suffer from reading difficulties, which can have a severe negative impact on daily life. These reading difficulties include reduced reading speed or endurance, skipping words or lines, and having problems understanding what is read.

In the Netherlands, rehabilitation centers currently do not offer evidence-based training to improve reading in people with HFVDs. We describe a novel project that aims to establish the effectiveness of two in-practice developed reading trainings for people with HVFDs. A single-blind randomized controlled trial is developed, comparing saccadic reading training ('Vistra'), rotated reading training and a waiting list control group. The goal of Vistra is to compensate for the HVFD by adapting eye movements whilst reading. Rotated reading training aims to reduce the effects of the HVFD by learning people to read in a different, individually tailored direction.

Participants will receive initial assessment of visual functions, reading performance and neuropsychological screening. At fixed moments, pre- and post-training assessments will take place. Participants in the control group will receive no training in between pre- and post-assessments. Outcome measures will focus on reading performance, vision-related quality of life and reading-related activities. Ethical approval will be requested at the UMCG, the trial will be registered at the Dutch Trial Register.

The project will lead to 1) establishing the effectiveness of two reading interventions for people with HFVDs, and 2) enhancing the understanding of HVFD-induced reading problems.

P04

Scanning behavior in hemianopia: The Next Step

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Homonymous visual field defects (HVFDs) are the largest group of visual disorders after acquired brain injury. Homonymous Hemianopia (HH), the most common form of HVFD, occurs in 8-31% of all stroke patients. HH can have a large influence on daily living and quality of life. People with HH mainly experience difficulties in mobility and searching. They benefit from training aimed to decrease the impact of the visual field deficit through optimizing visual scanning. Therefore, it is of utmost importance to inform patients about the way their scanning behavior relates to difficulties they experience in daily life and how they can improve it to overcome these difficulties. Knowledge about which scanning is optimal, however, is mostly based on experiences and assumptions of professionals, and not supported by scientific literature. This project (September 2019-2023) aims to examine the relationship between scanning behavior and performance on daily life activities (i.e. mobility and search activities) in people with HH, people with simulated HH and a control group with normal vision. Innovative techniques such as (mobile) eye-tracking and Virtual Reality (VR) will be used to examine scanning behavior in a standardized manner. For example, participants will perform a Virtual Street-Crossing Task. Prototypes of these techniques, developed in a pilot project, were seen as useful additions to vision rehabilitation therapy by people with HH and professionals. This project will help to develop innovative measures for scanning behavior that can be used in clinical practice. Data-collection starts late 2020 and ends approximately two years later.

P05

App library for rehabilitation

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Topic
Basalt is developing a library of apps suitable for physical medicine and rehabilitation (PM&R). The library is available via intranet for end users: therapists in PM&R. The library supports professionals in making efficient, evidence based choices in daily rehabilitation practice and increases the uptake of eHealth in PM&R.

Relevance
Last decade, there is an increasing interest in and urgent need for e-rehabilitation. Due to the enormous choice of apps it is difficult for therapists in PM&R to decide which apps support the patient during rehabilitation. Systematic assessment of the apps on key aspects is needed. These aspects are: aim and applicability, user friendliness, reliability, scientific evidence and privacy & security (based on: app guideline of the GGD, the Netherlands). Apps are classified in one or more categories of Positive Health (M. Huber). Additionally apps are matched with the current treatment programs/guidelines/care paths in PM&R.

Current status
Apps for speech therapy were assessed and matched with the stroke pathway. Apps which met the requirements were included in the library and processed into an interactive pdf form. The form is available on the intranet. Recently a start was made with apps to support (neuro)psychological therapy.

Plan of action
A collaboration with the GGD, National eHealth Living Lab, rehabilitation centres and universities of applied sciences is established to make the library available nationally for centres of PM&R. Subsequently also for professionals in rehabilitation in 1st line. Also a wider range of apps needs to be assessed via standard guidelines.

P06

Specialized orthotic care to improve functioning in adults with neuromuscular diseases: study protocol

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Introduction

People suffering from leg muscle weakness caused by neuromuscular diseases (NMD) are often provided with leg orthoses to reduce walking problems such as increased walking effort, diminished walking speed, reduced balance and falls. Yet, evidence for the effectiveness of leg orthoses to improve walking in this population is limited and there is an absence of standardized practice in orthotic prescription. Application of a multidisciplinary guideline aimed to standardize the orthotic treatment process in NMD (specialized orthotic care) seems beneficial in improving walking outcomes. However, larger studies are necessary to confirm results and investigate cost-effectiveness.

Research question

What is the (cost-)effectiveness of specialized orthotic care compared to usual care in adults with NMD?

Methods

A prospective randomized open label blinded end-point study (METc approval: AMC, NL7511) will be performed, in which 70 adults with slowly progressive NMD are randomly assigned to specialized orthotic care (intervention) or usual orthotic care (control). Outcomes will be assessed at baseline and at 3 and 6 months follow-up. Primary endpoints are walking energy cost (J/kg/m) and achievement of personal goals measured with the goal attainment scale. Secondary endpoints include walking speed, gait biomechanics, stability, physical functioning, (fear of) falling and satisfaction. For the economic evaluation, societal costs and quality of life will be assessed using cost questionnaires and the EQ-5D-5L.

Discussion

This study will be the first RCT to provide evidence on the (cost-)effectiveness of specialized orthotic care in individuals with NMD, which is necessary for the improvement of quality and efficiency of orthotic care.

P07

Visualisation of in-socket residual bone movement using B-mode ultrasound in a patient with a transtibial prosthesis

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Topic: The quality of a prosthetic socket fit dependents on force transmissions between the skeletal system and the prosthetic socket through soft tissue layers. In clinical practice, it remains challenging to create “optimal” socket fit and alignment that allow transmission of external forces with minimal stress on the soft tissues of the stump. Currently, this is a subjective process without the availability of objective information on soft tissue stress within the socket. Ultrasound is frequently used for visualization of musculoskeletal properties in vivo. The aim of this study was to develop and validate a method to apply b-mode ultrasound to track the in-socket residual bone movement for transtibial amputees.

Relevance: There is a necessity to objectify prosthetic socket fit and alignment, to improve prosthetic care. Visualisation of the residual limb within the prosthetic socket has the potential to objectively quantify effects of prosthetic interventions on stump-socket interactions and optimize prosthetic fit and alignment. Current status: We’ve succeeded to use b-mode ultrasound to visualize residual bone movement through a sub-atmospheric prosthetic socket with a DUO liner (Ohio WillowWood), while stepping forward, backwards and sideways. The movement was recorded in video format and quantified using image tracking software. Plan of action: Currently, a feasibility study is prepared addressing reliability and sensitivity analysis. To this end, residual limb movement will be monitored in amputees during gait with different prosthetic alignments.

P08

Production, strength testing and clinical research on low-cost 3D-printed transtibial prosthetic sockets for in rural areas

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Only 5–15% of the amputees in lower-income countries have access to prostheses. Costs of the prostheses are mainly too high, and facilities are not within reach. Measurement and production of traditional prosthetic sockets are time consuming, labor-intensive and highly dependent on the experience and skills of the personnel involved. An alternative way to achieve faster and more consistent production of low-cost transtibial prosthetic sockets and to service a larger number of individuals, is using computer-aided designing (CAD) and computer-aided manufacturing (CAM).

Fused Deposition Modeling (FDM) is a better accessible method of 3D printing in terms of costs of the printer and print materials. Tough PLA was deemed the most suitable print material for FDM. The 3D printed prosthesis was investigated according to the International Standard Structural Testing of Lower Limb Prostheses. The socket almost complies with this standard.

In the period from February to April 2020, seven people received a 3D printed traditional prosthesis in the village of Masanga in Sierra Leone. Questionnaires were used before and after obtaining the prostheses to test the use, quality and satisfaction of the prostheses. After a few weeks of physiotherapy, all participants reached their personal goal. Using their prostheses, patients were no longer in need of their crutches.

We have come a step closer in the production of low-cost prostheses for less developed countries. In a few months we will do the long-term follow-up. For now, we will conduct further research to fine-tune the concept of 3D printed prostheses for undeveloped countries.

P09

How do people after stroke adapt step parameters and margins of stability at different walking speeds?

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Introduction
Differences in step frequency, step length and step width exist between people after stroke and able-bodied controls. These differences are suggested to affect gait stability. It is, however, unclear how these differences depend on differences in walking speed between groups.

Objective
To investigate whether people after stroke select their step pattern differently from able-bodied controls at different walking speeds, and the potential effect of these differences on gait stability.

Patients
28 sub-acute post-stroke individuals (separated between more and less impaired, based on preferred walking speed (PWS) <> 0.8 m/s) and 14 able-bodied controls.

Methods
All participants completed five walking trials at 70%, 85%, 100%, 115% and 130% of PWS. Step frequency, step length, step width and margins of stability were calculated.

Results
When controlling for walking speed, more impaired stroke patients walked with a higher step frequency ($p<0.01$), a smaller step length ($p<0.01$), but with similar step width ($p=0.76$) compared to able-bodied controls. Less impaired patients only walked with wider steps ($p<0.01$). Margins of stability were similar for more impaired patients and able-bodied controls, but larger in medio-lateral direction for the less impaired patients ($p=0.03$).

Discussion and conclusions
Differences exist in step pattern between people after stroke and able-bodied controls independent of walking speed. These differences did, however, not result in differences in margins of stability and might even cause larger medio-lateral margins of stability in less impaired patients.

Clinical message
Different step parameters could be a useful compensation in terms of margins of stability in people after stroke.

P10

Long-term outcomes of reconstructive upper extremity surgery in spinal cord injury (SCI) patiënts with tetraplegia and the influence of spasticity.

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Introduction
Upper extremity surgery in patients with tetraplegia can improve function and skills. In recent years the number of SCI patients with spasticity is increasing. The influence of spasticity on longterm outcome of upper extemity surgery has not been previously evaluated.

Objective
Long-term outcomes and influence of spasticity after reconstructive upper extremity surgery.

Patients
19 persons with tetraplegia who underwent upper extremity surgery between 1995-2013.

Methods
Retrospective file review and prospective assessment of arm-hand function, patient satisfaction and spasticity. The results were compared to non-operated reference groups from the literature.

Results
QIF-sf scores were at least 10 points higher compared to the reference group. The study group showed a significant higher score (p=0.02) on the GRASSP 'quantitative prehension' and active muscle strength in elbow extension, cylinder and lateral grip. Long-term VAS patient satisfaction was 7.9 compared to 7.1 at clinical discharge. Outcome scores were not influenced by spasticity, however only a minority (N=4) of the persons had mild spasticity.

Discussion and conclusions
This study shows that upper extremity surgery has a long term positive outcome on functionality and patient satisfaction. Reference groups from literature were used therefore matching of study and control groups was not optimal. A shortcoming in this study is the limited standardized assessment, which means that pre- and postoperative functioning is not comparable. In our study, long-term functionality and patient satisfaction were not negatively affected by spasticity.

Clinical message
Further research into long-term effect of spasticity on post-operative functionality and satisfaction after reconstructive surgery is needed.

P11

Visual complaints and disorders in patients with multiple sclerosis

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Introduction: Vision problems are not well documented in patients with MS and may be underestimated. Therefore, patients are not referred to the rehabilitation they need.
Objective: To explore visual complaints and visual disorders among patients with MS and understand how the complaints may relate to demographical variables and visual functioning.
Patients: 478 patients with MS (19-96 years) and 648 matched healthy participants.

Methods: The Screening Visual Complaints (SVC) was used to assess visual complaints and as a referral tool for further rehabilitation. Visual functioning and visual perceptual functioning were assessed in 53 referred patients.

Results: Almost 90% of the patients reported visual complaints. Commonly experienced (41-57%) complaints were blurry vision, difficulty focussing, photophobia, needing more time, difficulty reading, difficulty adapting and reduced contrast sensitivity. All complaints occurred in at least 11% of the patients. The visual functions most often abnormal were smooth pursuit and saccades. Contrast sensitivity, visual fields and nystagmus were regularly abnormal. All patients had a visual acuity above 0.3 (LogMAR 0.52). The visuoperceptual functions most often abnormal were visual search, visual motor speed and figure-ground. Some patients had affected non-lateralized attention and object recognition.

Discussion and conclusions: A wide range of visual complaints occur in MS. Eye movements, contrast sensitivity and visual field were most often affected. None of the referred patients showed abnormal visual acuity. Visual perception problems occurred less often, but abnormal scores were found on all visuoperceptual abilities assessed.

Clinical message: Recognition and knowledge of visual complaints and disorders facilitate referrals and high-quality rehabilitation.

P12

Re-learning motor abilities during arm-hand rehabilitation: The quest to speed up arm-hand performance in stroke survivors with a moderately to severely affected arm-hand.

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Introduction
In stroke patients, a low level of self-efficacy is correlated to diminished beliefs and values of patients self-perceived performance and is associated with sub-optimal use of the moderately to severely affected arm–hand. The Concise-Arm-and-hand-Rehabilitation-Approach-in-Stroke (CARAS) incorporates a well-defined clinical reasoning model combining (intensive) task-oriented training and self-efficacy principles to empower stroke patients in regaining full potential of their affected arm and hand.

Objective
To ascertain the extent to which subacute stoke patients might improve on arm-hand function (AHF) and arm-hand skill performance (AHSP), having received CARAS.

Methods
This single-armed prospective cohort study featured a heterogeneous group of subacute stroke patients, stratified into either a severely, moderately or mildly impaired AHF group. Treatment consisted of CARAS. Measurements at AHF and AHSP level were performed at admission, clinical discharge, 3, 6, 9 and 12 months after clinical discharge.

Results
Seventy-six patients (63 males; mean age: 57.6 years (sd:10.6); post-stroke time: 29.8 days (sd:20.1)) participated. Between baseline and 1-year follow-up, AHF increased by 91% ($p<.000$), AHSP increased by 96% ($p<.000$), self-perceived AHSP increased by 64% ($p<0.056$),Intensity-of-arm-hand-use on the affected side increased by 51%, 114% and 14% ($p<.000$) mildly, moderately and severely affected patients, respectively.

Conclusion
A majority of stroke patients across the whole arm-hand impairment severity spectrum significantly improved on AHF, AHSP, self-perceived AHSP and actual arm-hand-use. These results were maintained up to one year post-rehabilitation.

Clinical message
Combining task-oriented training with self-efficacy principles may lead to patients recognizing their improvements at an early phase post-stroke

P13

Paid work and (satisfaction with) participation among stroke patients who were in paid work before stroke - a prospective cohort study

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Introduction: Research in stroke patients working before stroke often focuses on work rather than participation as a whole.

Objective: 1) Describe work outcomes and participation in patients working before stroke; and 2) Compare (satisfaction with) participation among patients who remained in paid work with those who did not.
Patients: Participating in the Stroke Cohort Outcomes of REhabilitation (SCORE)-study, <66 years at follow-up and paid work before stroke.

Methods: Patients completed questionnaires on paid work and participation (Utrecht Scale for Evaluation of Rehabilitation – Participation (USER-P), score 0-100) at start of rehabilitation and 6, 12, 18, and 24 months thereafter. Comparison between patients in paid work with those who were not was done by means of Mann-Whitney U tests.

Results: 178 patients were included. 123 completed 24 months follow-up. At 24 months, 73/123 (59%) patients were in paid work. Of 49 patients the precise work situation was known, with 37 (76%) in paid work without sick leave. Patients no longer in paid work had lower levels of participation (27.4 + Standard Deviation (SD) 8.4 vs 34.5 + SD 11.7, p-value 0.001) and were less satisfied with participation (60.4 (Inter Quartile Range (IQR) 47.2-75.0) vs 80.0 (IQR 63.8-95.0), p-value < 0.001) than patients in paid work at 24 months follow-up.

Discussion and conclusion: Stroke patients not able to remain in paid work reported lower levels of (satisfaction with) participation than those who did.

Clinical message: Interventions are needed to support stroke patients with return to work since working increases satisfaction with participation.

P14

Breinstraat facilitation of digital peer to peer expertise for children and young adults with acquired brain injury

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Topic
The aim of the project is to design, develop, nationally implement and evaluate a digital peer support platform. Breinstraat provides a community, information, clips, tips&trics, coaching for children and transition-age young adults (12-25 yrs) with ABI. Designed with patient experts in the lead, meeting their wishes and needs, enabling peer to peer communication and support. Moderation will be done by patients experts.

Relevance
Breinstraat meets an important demand from the target group itself. Patient experts are an important source of information, recognition, understanding and support for other patients. Co creation with patients matches the shift in rehabilitation to more value-based care, self-management and focus on positive health.

Current status
Focus groups (33 patients + 20 professionals) in partner organisations (Heliomare, Breinsupport and Basalt) made an inventory of wishes and needs of the target group. These were processed in the design and development of the platform. A national implementation and evaluation plan for all stakeholders is in the making.

Plan of action
Students (Communication&MediaDesign) will further design the platform and test usability. Twenty patient experts will be video-interviewed, i.e. on their ABI history, coping and participation. The videos are tagged thematic for easy access. After completion of the first version, it will be tested in pilot in the 3 partner organisations where after it will be further optimised based on feedback of user group and professionals. In 2021 Breinstraat will be implemented stepwise and evaluated (usage, satisfaction) in rehabilitation, special education and acute and chronic care up till May 2022.

P15

Transparency in pain rehabilitation by unraveling working mechanisms for chronic musculoskeletal pain.

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

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

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

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

P16

Energy cost of walking in people with a lower limb amputation: a systematic review and meta-analysis

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Objective: To quantify differences in energy cost of walking (ECw) between people with a lower limb amputation and able-bodied controls, taking into account the influence of cause of amputation, level of amputation, and walking speed.

Search strategy: We searched for studies (published until March 2020) that compared ECw in people after lower limb amputation to an able-bodied control group. A meta-analysis investigated the general increase in ECw after amputation, and possible influence of level and cause of amputation. In a second analysis, we included all articles with and without an able-bodied control group to investigate the effect of walking speed. We electronically searched PubMed, Cinahl and PEDro, using keywords including: energy cost, energy expenditure, lower limb amputation, artificial limbs and walking.

Selection of articles: Our search yielded 526 articles, 25 of which were selected for the meta-analysis while 40 additional articles were included in the walking speed analysis.

Conclusion: People after lower limb amputation have significantly higher ECw compared to able-bodied controls. Amputation level and cause significantly influenced the increase in ECw, with largest increases noted for people with a vascular transfemoral amputation (103%), followed by non-vascular transfemoral amputation (41%), vascular transtibial amputation (36%) and non-vascular transtibial amputation (12%). Importantly, preferred walking speed appeared to have a major effect on the ECw, with lower walking speeds resulting in increased ECw. People with a vascular cause of amputation are severely under-represented in literature. The results of this study can be used in clinical practice to set patient-specific expectations for ECw.

P17

Individual response to motor network transcranial direct current stimulation as alternative to unihemispheric stimulation

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Introduction
The effectiveness of tDCS on TMS-elicited motor evoked potentials was recently suggested to increase more by stimulating the entire motor network than by only stimulating the hemisphere contralateral to the stimulated muscle as in conventional motor tDCS.

Objective
The goal of the current study is to verify that motor network tDCS indeed increases motor evoked potentials more than conventional motor tDCS.

Patients
This study was conducted in 21 healthy, right-handed subjects aged between 18-30 years.

Methods
Participants attended three sessions, in which either motor network, conventional, or motor network sham tDCS was applied. TMS was used to assess baseline cortical excitability (65 TMS pulses, motor evoked potentials recorded from the first dorsal interosseous) before onset of 10 minutes of tDCS. Cortical excitability was assessed again directly after the tDCS session ended in intervals of 15 minutes, until 60 minutes after the stimulation ended.

Results
On a group level, we found no effect stimulation conditions on cortical excitability, nor an interaction effect between time and stimulation condition. Single-subject analysis revealed increases in cortical excitability for some subjects, but not consistently for both motor network and conventional tDCS.

Discussion and conclusions
The preliminary results of this study demonstrate large variability in individual responses to tDCS. More effort should be made to combine tDCS with neurophysiological measurements to understand the causes underlying this variability.

Clinical message
These results further emphasize the need to better understand the working mechanisms of tDCS before it can reliably be applied in a clinical setting.

P18

Virtual reality in treatment of chronic pain; an explorative outcome study

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Introduction: Chronic pain is a common health problem in the Netherlands which results in daily life problems and lower quality of life. Pain education is considered as an important first intervention according to (inter-)national guidelines. Reducept (www.reducept.nl) is a virtual reality program aimed at pain education and pain management strategies.

Objective: To explore quantitative and qualitative outcome of 4 weeks Reducept-training.

Patients: Patients with chronic pain for more than 3 months.

Methods: Short Form Health Survey (SF-12), Pain Disability Index (PDI) and VAS-pain scores were measured and semi-structured interviews were performed to explore the experiences of the Reducept program and its results.

Results: 55 patients were included, (n=48 primary care, n=7 rehabilitation center), 38 female, 18-86 years old (mean: 51). A significant improvement was found on all outcome measures. No differences were found between primary care and rehabilitation center. No relation was found with age or years of chronic pain. 44% mentioned Reducept is education, 25% mentioned Reducept is medicine, 27% mentioned both. 29% bought the Reducept themselves after intervention. Patients differ largely in their appreciation of the different parts of the Reducept program, from boring to exciting.

Discussion and conclusion: The results of this explorative outcome study are promising for Reducept as a pain education program. An effect study is needed to see if outcomes are related to the Reducept program or other mechanisms.

Clinical message: Using Reducept seems a promising way for standardized pain education.

P19

Added-value of spasticity reduction to improve arm-hand skill performance in sub-acute stroke patients with a moderately to severely affected arm-hand

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Introduction
Spasticity is a hindrance when trying to elicit the full training potential of the affected arm-hand during rehabilitation in stroke patients with a moderately to severely affected hand.

Objective
To assess to what extent arm-hand function (AHF) and arm-hand-skill-performance (AHSP) may improve by reducing early signs of spasticity in sub-acute stroke patients.

Patients
Ten sub-acute stroke patients (UAT:1-2,MAS:1+ to 3).

Methods
Multiple baseline single-case-experimental-design and meta-analysis, involving 10 single cases. Training: 2x6 weeks of a well-described arm-hand regime, including gross-motor-grip arm-hand rehabilitation.
BoNT-A: administered once within the first 5 weeks. Measurement dates: weekly within the first 12 weeks; every 2-weeks during the ensuing 12 weeks. Measures: ARAT, ABILHAND, Fugl Meyer Assessment, grip-strength, Motricity Index.

Results
At group level, after linear detrending, added-value of BoNT-A on AHF and AHSP could not be confirmed. Not detrended data revealed that patients improved significantly over time on AHF and AHSP on all measurements ($p \leq 0.037$) due to the combination of BoNT-A and CARAS.
At individual level, after baseline trend correction, 7/10 patients improved on AHF: FMA (N=4) ($p \leq 0.019$), grip-strength (N=3) ($p \leq 0.014$) and MI (N=4) ($p \leq 0.002$), whereas 6/10 patients improved on AHSP: ARAT (N=3) ($p \leq 0.042$), ABILHAND (N=5) ($p \leq 0.034$).

Conclusion
In a number, though not all, individual patients, application of BoNT-A may have an added value in reducing early signs of spasticity.

Clinical message
To combine a well-defined therapy-as-usual with early post-stroke spasticity reduction may improve arm-hand performance in sub-acute stroke patients suffering from spasticity, and who display no dexterity at the point of therapy admission.

P20

Functional capacity of individuals with brachial plexus injury

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Introduction:
To enable (pain free) functioning, individuals with brachial plexus injury (BPI) may require a higher functional capacity (FC) compared to two-handed individuals, because the load on unaffected structures is higher.

Objectives:
1. To compare FC of individuals with BPI to healthy controls.
2. To explore differences in FC of individuals with BPI (1) with and without hand function (2) for the affected and unaffected limb(3) and with and without musculoskeletal complaints (MSC).

Methods:
23 individuals with BPI and 20 healthy controls performed 6 FC tests for one-handed individuals. Hand function was assessed with physical examination; a questionnaire was used to assess MSC.

Results:
Individuals with BPI scored worse on the 2 two-handed tests, compared to controls (both $p \leq 0.01$, effect size (r) ≤ -0.41). When individuals with BPI used their unaffected limb, they performed similar to controls on the 4 one-handed tests; they performed worse when using their affected limb; and results did not differ between individuals with and without hand function, except for the two-handed overhead lifting test. Test result of individuals with BPI with (n=11) or without MSC were similar.

Discussion and Conclusions:
Two-handed FC in individuals with BPI is lower compared to two-handed individuals. Capacity of the unaffected limb is similar to the dominant limb of healthy two-handed individuals, which may actually reflect a relative capacity deficit of the unaffected limb. MSC were not associated with lower FC.

Clinical message:
FC is lower in individuals with BPI; implication for return to work, MSC and rehabilitation need further study.

P22

The Shoulder Elbow Perturbator (SEP): a single device to quantify post stroke motor impairments of the elbow

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Introduction: Current clinical measurement tools are inadequate to reliably quantify motor impairments. While robotic devices have been shown to quantify these impairments more precisely and accurately, they can measure only one or two impairments.

Objective: To test a new robotic device – the Shoulder Elbow Perturbator (SEP) – that can quantify muscle weakness, abnormal synergy, viscoelastic joint properties, and spasticity of the elbow following stroke.

Patients: 10 chronic stroke patients with upper limb impairment and 20 age-matched healthy controls.

Methods: Four measurements were carried out: 1) maximum muscle strength measurement (flexion and extension), 2) Viscoelastic joint measurement using slow passive elbow rotation, 3) Spasticity measurement using fast passive elbow extension, and 4) abnormal synergy, measuring active elbow extension under different arm weight support levels. For each parameter outcome, Z-scores were calculated to determine the degree of impairment.

Results: Only 1 stroke patient had values inside the reference interval of controls ($-1.96 < Z < 1.96$) for all impairments; 6 patients had signs of abnormal muscle weakness, 6 patients had increased viscoelasticity, 6 patients had abnormal synergy, and 8 patients had spasticity. The total measurement protocol took about one hour and perceived exertion and pain during the measurements was low.

Discussion and Conclusion: The SEP can quantify multiple impairments on one device and distinguish impairment between stroke patients from healthy controls.

Clinical message: Accurate differentiation of the type motor impairment after stroke may help to target treatment and optimize rehabilitation outcome. The SEP could provide such information to clinicians.

P23

Three-D-freehand ultrasound technique of the medial gastrocnemius muscle belly volume in stroke patients and healthy subjects: a pilot study.

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Introduction
Stroke patients often develop adaptive muscle changes as a result of neural and non-neural processes. However, it is still unclear how these adaptive muscle volume changes after stroke are related to muscle weakness and compensation strategies such as disuse or overuse. Therefore, there is a need for objective assessment for diagnosis and follow-up of muscle belly volume after stroke.

Objective
In this study, we evaluated the feasibility of a three-D-freehand ultrasound technique (3DfUS) of the medial gastrocnemius muscle belly volume in stroke patients and healthy subjects.

Patients
Five chronic first-ever stroke patients and five healthy subjects.

Methods
Medial gastrocnemius muscle belly volume of five chronic first-ever stroke patients and five healthy subjects was measured by 3DfUS, at rest on two occasions by two evaluators. Intra- and interrater reliability was assessed for data acquisition and data processing using the intra-class correlation coefficient (ICC) and the standard error of measurement (SEM).

Results
The test-retest reliability was very good for both acquisition (intra-rater ICC=0.99, inter-rater ICC=0.97) and processing (intra-rater ICC=0.99, inter-rater ICC=0.99). SEM values expressed as a percentage of the muscle volume ranged from 1.4 to 2.0% for both intra- and inter-rater data acquisition and data processing.

Discussion and conclusions
Initial reliability findings support the application of a clinically feasible 3DfUS for muscle belly volume quantification of the medial gastrocnemius in chronic first-ever stroke patients and healthy subjects, and warrant further investigation.

Clinical message
These preliminary findings hold promise for objective assessment for diagnosis and follow-up of muscle belly volume after stroke.

P24

Predictors for caregiver strain, quality of life and emotional wellbeing of caregivers of patients after a cardiac arrest.

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Approximately 40% of the caregivers experience a high impact of the event, resulting in high burden. Predictors for developing high burden are unknown.

We aim to identify predictors, known in the (sub)acute phase after cardiac arrest for strain, emotional wellbeing and quality of life (QOL) at one year post-cardiac arrest.

The data on these caregivers were collected as a part of a larger project called ALASCA. Our population consisted of 195 caregivers.

Prospective cohort-study following the caregivers up to one year. Prognostic personal, subjective outcome factors and patient outcome factors measured at baseline were selected and entered into a regression model to asses whether they were predictive of QOL, emotional wellbeing and strain at one year.

Anxiety, lower scores for general health and low patient scores on mental functioning were significant predictors of a higher strain. Bodily pain, post-traumatic stress and low patient scores on emotional wellbeing were significant predictors of lower emotional wellbeing. More cognitive complaints and lower scores on the EuroQolVAS were significant predictors for lower physical QOL. Depression and cognitive complaints were significant predictors for lower mental QOL.

Although this study looked at a broad range of potential predictors, we still don't know how these mechanisms work. Further studies could therefore focus on identifying mediation factors.

This study identified predictors of strain, QOL and emotional wellbeing one year after the cardiac arrest. Screening of these factors in early stages can identify caregivers with possibly unfavourable outcomes at one year. For those caregivers targeted interventions may be offered.

P25

Parenting a child with Marfan syndrome: distress and everyday problems

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Introduction
Marfan syndrome (MFS) is a multisystemic, autosomal dominant connective tissue disorder, de novo in 25%. In many families, parent and child(ren) are affected, which may increase distress in parents.

Patients and methods
To assess distress, 42 mothers (29% with MFS) and 25 fathers (60% with MFS) of 43 children completed the validated screening-questionnaire Distress thermometer for Parents of a chronically ill child, including questions on overall distress (score 0-10;≥4 denoting 'clinical distress') and everyday problems (score 0-36).

Results
Data were compared to 1134 control-group parents of healthy children. Mothers reported significantly less overall distress (2;1-4 vs 3;1-6,p=.049, r=-.07) and total everyday problems (3;0-6 vs 4;1-8,p=.03, r=-.08) compared to control-group mothers. These comparisons were not significant between father groups. No differences in percentages of clinical distress were reported between mothers and control-group mothers (33% vs 42%); mothers without and with MFS (26% vs 50%); fathers and control-group fathers (28 vs 32%); fathers without and with MFS (30% vs 27%). Distress was not associated with the children's MFS characteristics.

Discussion and conclusions
Parents of a child with MFS did not show more clinical distress compared to parents of healthy children. However, clinical distress was reported in approximately one-third and may increase in case of acute medical complications.

Clinical message
We advise monitoring distress in parents of a child with MFS to provide targeted support.

P26

Measurement properties of patient-reported outcome measures within chronic musculoskeletal pain: a mapping review

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Objective

Patient-reported outcome measures (PROMs) enable patients with chronic musculoskeletal pain (CMP) to rate perceived physical or psychological functioning, or health-related quality of life. It is desired to use PROMs with satisfactory measurement properties. This mapping review identifies what has hitherto been published on measurement properties of pre-selected PROMs within the field of CMP.

Search strategy

Multiple databases were searched: MEDLINE (Ovid), PsycINFO (Ovid), EMBASE (Ovid), and CINAHL (EBSCOhost). IT developed search queries that were peer-reviewed and tailored for each database by data search experts.

Selection of articles

Two reviewers independently screened records by title, abstract, and full text using the web-based system Rayyan. Disagreements were mediated by a third author. Studies had to present original data reporting on validity, reliability, responsiveness, or interpretability (COnsensus-based Standards for the selection health Measurement INstruments (COSMIN)) of PROMs. Included PROMs were Checklist Individual Strength (CIS), Hospital Anxiety and Depression Scale (HADS), Illness Perception Questionnaire (IPQ), (Nijmeegse) Hyperventilation List (NHL), Pain Catastrophizing Scale (PCS), Pain Disability Index (PDI), Psychological Inflexibility in Pain Scale (PIPS), Pain Self Efficacy Questionnaire (PSEQ), Patient Specific Functional Scale (PSFS), Symptom Check List-90 items (SCL-90), Short Form-12 items (SF-12) and Utrecht Coping List (UCL).

Conclusion

Knowledge gaps were identified on measurement properties of PROMs as used in Dutch rehabilitation settings. Internal consistency, construct validity, and responsiveness were well addressed for multiple PROMs within CMP. The results aid commissioning of future research to fill knowledge gaps. Available evidence on measurement properties of PROMs should be systematically reviewed on quality and outcomes.

P27

Long-standing multidisciplinary program of aftercare for patients with spinal cord injury, reduces secondary health problems and burden of disease with improvement of QoL

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Introduction & objective:
There is increasing evidence that lifestyle interventions can improve the burden of disease and quality of life in chronic diseases. For spinal cord injury (SCI) it is known that with increasing life-expectancy, more secondary health problems occur. Detected to late those will lead to additional medical interventions and higher costs.
Therefore, in the Netherlands, aftercare for SCI-patients is promoted.

Patients & methods:
Since 2004, a multidisciplinary follow-up outpatient clinic has been carried out in the Sint Maartenskliniek for patients with SCI in the chronic phase, once every 2 years.
Yearly, or once every two years, the patient is seen by a rehabilitation specialist, nurse specialist, physical therapist, occupational therapist and social worker or psychologist for half an hour each. This is followed by a joint evaluation, after which personal recommendation is given to the patient.

Results:
Of 300 patients who visited our clinic for aftercare, we scored the given recommendations on different domains of specific and spinal-cord-injury-related care. The domains were medical interventions, skincare, bowel management, bladder management, functional status, social and psychological wellbeing and medical devices.
We will present an overview of multiple types of recommendation and interventions for the different domains.

Conclusions:
We can conclude that the organization of a multidisciplinary aftercare clinic for patients with a SCI in a center specialized in spinal cord injury will contribute positively to the prevention of secondary health problems, the burden of disease and the improvement of quality of life for patients with a spinal cord injury.

P28

EEG correlates of motor learning in healthy subjects during a sequential visual isometric pinch task

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Introduction
The development of new neurorehabilitation interventions could potentially benefit from neural correlates of motor learning by providing objective monitoring targets. However, inter-individual differences in motor learning and brain function make it challenging to identify these correlates.

Objective
The goal of this study is to quantify motor learning by comparing spectral brain power during a complex and simple motor task.

Patients
Twenty healthy, right-handed subjects aged between 18-30 years.

Methods
Participants performed a complex and a simple sequential visual isometric pinch task while EEG was recorded. Independent component analysis was applied on the channel data to reconstruct source activations. Average spectral power during trial preparation and execution was calculated for theta, alpha and beta frequency bands for clustered components. Individual learning rate was calculated as the difference between the learning slopes of the complex and simple motor task.

Results
Motor learning showed a positive relationship with theta frequency band power. Contralateral beta power did not correlate with motor learning. No differences between tasks were found in beta power in the contralateral motor cortex, however, ipsilateral motor cortex beta ERD was larger during the complex motor task.

Discussion and conclusions
Motor learning is typically associated with changes in beta power in the primary motor cortex. This study indicates that contralateral theta and ipsilateral beta power changes may reflect informative correlates of motor learning as well.

Clinical message
Neural correlates of motor learning may go beyond conventional contralateral beta band changes and extend to ipsilateral beta changes and theta frequency band variations.

P29

Implicit and explicit methods of instruction in dance classes and group physiotherapy sessions for patients with Parkinson's disease

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Introduction: Implicit methods of instruction seem more beneficial than explicit methods for patients with Parkinson's disease (PD). In this population, dance interventions show promising effects, compared to conventional physiotherapy. However, little is known regarding instruction methods in these two settings.

Objective: This study aimed to gain insight in the use of implicit and explicit teaching methods in (1) physiotherapy and (2) dance for PD patients.

Participants: Five dance teachers and two physiotherapists were included.

Methods: Two sessions were videotaped of each instructor and analyzed in Noldus Observer with a newly created classification system to register the frequency and duration of used forms of instruction, feedback, practice conditions and learning strategies.

Results: Both dance teachers and physiotherapists used more implicit methods than explicit methods for frequency (dance: 67.2±5.7% implicit vs. 32.8±5.7% explicit; physiotherapy: 56.8±2.1% implicit vs. 43.2±2.1% explicit; $F(1,11) = 63.99$, $p<.001$, $\eta p2 = .85$) and relative duration (dance: 85.4±4.8% implicit vs. 14.6±4.8% explicit; physiotherapy: 81.9±6.8% implicit vs. 18.1±6.8% explicit; $F(1,11) = 10.35$, $p<.01$, $\eta\rho2 = .49$). For frequency, dance teachers used more implicit methods and less explicit methods than physiotherapists ($F(1,11) = 11.86$, $p<.005$, $\eta p2 = .52$).

Discussion and conclusion: Implicit methods were used more than explicit methods in both intervention types. Dance teachers and physiotherapists differed in which specific techniques they predominantly employed. Future research should investigate the effects of the described techniques on motor learning and performance in PD patients.

Clinical message: Besides physiotherapy, dance might be a good method to evoke implicit motor learning.

P30

Modified Constraint Induced Movement Therapy, how does it look like and what are the effects?

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Introduction: Treatment of upper extremity paresis is one of the biggest challenges in rehabilitation after stroke and other types of brain injury. Modified Constraint Induced Movement Therapy (mCIMT) is proven to have a positive impact on functional arm use.
Objective: We will describe the mCIMT protocol which has been implemented in Reade rehabilitation centre in Amsterdam and will evaluate the effects on functional outcome of the upper limb.
Patients: 96 patients with stroke and acquired brain injury who particpated in mCIMT between 2008 and 2017 in Reade.

Methods: The mCIMT intervention consists of a six-week program, in which all key elements of CIMT are applied, i.e. repetitive training, constraining and the use of a transfer package. Psycho-education and relaxation were also added. Patients were treated 6 hours per day, 3 days per week in a multidisciplinary team.
We collected baseline patient characteristics and performed upper limb assessments before and after the six-week program.
Results: Participants were on average included 15 months after brain injury. An average improvement of 5,64 ($P<0,001$) was seen on the ARAT.

Discussion and Conclusions The positive effect of mCIMT was confirmed in our study. Although it is a key element of CIMT, the transfer package is often lacking in CIMT studies. In Reade, the transfer package was applied, for instance by a weekly interview using the Motor Activity Log.

Clinical Message: The role and content of the transfer package needs more attention, including for instance relapse prevention by means of telephone contact after treatment has ended.

P31

eHealth in times of Corona; The corona crisis increases the sense of urgency for Remote Care (eHealth): how to make sustainable choices?

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Topic
Corona crisis and corresponding measures increased the need for eHealth applications that enable remote care (RC). The enormous increase of both demand and supply for RC require a structured approach towards implementation. Since five years, the SmartLab at Basalt supports the organisation to: implement user-friendly eHealth applications and to support/educate end-users to use eHealth. By applying this approach during the Corona crisis we ensure sustainable RC afterwards.

Relevance
RC secures continuation of outpatient rehabilitation care during the Corona crisis. This requires, adjustment of care processes while simultaneously providing support for end-users (i.e. what and how). Furthermore, initiatives need to be collected and monitored to prevent overlap and wrong choices.

Current status
Caregivers substitute face2face contacts for video consultations. Furthermore, we scaled up eHealth applications for physical/mental exercise and we provided inspiration to stay active through easily accessible movies (social media).
To support this an ‘eHealth scale up team’ has been formed, to create a sustainable package of RC applications and proper instructions how to use them including a support desk. Usage is being monitored for timely adjustments and evaluation afterwards. The intranet site is used to share information about eHealth applications for RC with guidelines made by students.

Plan of action
Based on the outcomes of our evaluation and the experiences with different applications a future plan for the continuation of RC as an integral part of our care path ways will be made. The SmartLab will continue to support the implementation and testing of the eHealth for RC.

P32

Increasing velocity-dependent reflexes over weight-support levels can be used to quantify spasticity around the elbow in stroke patients

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Introduction: Current clinical measurement tools generally identify symptoms of motor impairments, while robotic devices are able to quantify the impairments more precisely and accurately.

Objective: Quantifying the effect of arm weight support on spasticity around the elbow in stroke patients.

Patients: Sixteen chronic stroke patients with upper limb impairment and 17 age-matched healthy controls.

Methods: Subjects had to “relax” while continuous random multisine torque-perturbations (0.2-12Hz) were applied around the elbow at five weight support levels (0%-100%, 25% increments, increasing abduction force).For each weight-support level, the velocity-dependent reflex parameters were identified using system identification. A line of best fit was calculated for the changes over weight-support levels. Outcomes were compared with the Modified Tardieu Scale (MTS).

Results: Of the patients with increased velocity-dependent reflexes (>2SD of healthy controls), four matched with an MTS of 2 (catch), two with an MTS of 1 (increased resistance) and three with an MTS of 0 (no resistance). All patients without an increased velocity-dependent reflex had an MTS of 0. The mean slope of the best fit showed that the increased group differed from the healthy group ($p<0.0001$) and “normal” group ($p<0.01$), there was no difference between the “healthy” and “normal” group ($p = 0.56$)

Discussion and Conclusion: Spastic patients showed increased velocity-dependent reflex over weight-support level compared to healthy and non-spastic patients. Three “increased” patients had no-resistance in the MTS, suggesting that the manipulator might be more sensitive for resistance changes.

Clinical message: Robotic-based diagnostics could provide more in-depth information about the origin of impairments.

P33

A practical and evidence-based framework for clinical rehabilitation management of the shoulder at risk

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Topic
Shoulder pain is known to be highly prevalent among persons who suffer from neurologic deficits. How to resolve shoulder pain in patients who suffer from a central neurologic disease?

Relevance
Due to stroke, spinal cord injury or peripheral lesions the shoulders musculoskeletal aspects change radically which on its turn influences the resting position and dynamic motion abilities of the shoulder joint and leads to discomfort at a person's activity- or participation level during or after the rehabilitation period.

Current status
A practical and evidence-based model has been developed in order to ensure that all clinical features contributing to the presenting shoulder pain are adequately addressed.
The content of the model encompasses: a) the analysis of shoulder problems; b) the application of evaluation assessments; and c) the application of interventions to ameliorate shoulder pain and/or discomfort. The model supports the differentiation between primary symptoms, caused by the central neurologic deficits itself, and secondary complaints due to, for example, inactivity.

Plan of action
The model has been converted into a course 'Shoulders in Balance', in which both motor learning principles and all clinical features contributing to shoulder pain or discomfort are addressed. The course reflects a structured overview for clinicians, encompassing all relevant clinical features to cover shoulder pain and/or discomfort in patients with a central neurologic deficit. It may have an added-value in supporting PT's and OT's daily clinical practice to identify the origin of shoulder pain in early phase and react efficiently by offering most essential interventions.

P34

Identification of specific gait patterns in Hereditary Spastic Paraplegia (HSP) using visual gait assessment as a guide for treatment decisions

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Introduction:
HSP is characterized by progressive spasticity and weakness of the lower limbs resulting in various gait abnormalities. Previous studies mostly used instrumented (3D) gait analysis to assess gait in HSP and differentiate gait subtypes. A possible alternative for these complex and time-consuming gait analysis systems is a standardized (video-based) visual gait assessment. The question is whether a video based system is suitable for quick identification of specific gait types and applicable in routine clinical practice.

Objective:
To identify specific gait patterns in HSP with standardized visual gait assessment and determine whether these gait types can be used to guide treatment decisions.

Patients:
55 (2D) gait analysis videos from 43 patients with HSP were assessed.

Methods:
Gait patterns were identified using the Edinburgh Visual Gait Scale (EVGS) and compared to patterns found using instrumented (3D) gait analysis from literature.

Results:
Six gait types were identified: normal-like, increased knee-flexion at initial contact, recurvatum knee, stiff knee, crouch and jump knee gait. With the five most relevant parameters from the EVGS we created a new gait assessment scale to identify gait patterns in HSP and used this as a basis for developing a guide for treatment.

Discussion and conclusions:
A visual gait assessment scale was created to identify gait patterns in HSP and help guide treatment decisions. Further studies are needed to confirm clinical applicability.

Clinical message:
Identification of gait patterns in HSP can be simplified and standardized for clinical practice using visual gait assessment and can help clinicians select treatment options.

P35

Custom-made footwear for indoor use increases short and long-term adherence in people with diabetes at high ulcer risk

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

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

Patients
Custom-made indoor footwear was provided to 22 persons with diabetes, a previous foot ulcer, and who were non-adherent to wearing their 'regular' custom-made footwear (adherence <80% of steps).

Methods
Adherence (percentage of steps that the footwear was worn) was assessed indoors and outdoors at baseline (regular footwear only), and one and twelve months after provision of indoor footwear (regular+indoor footwear).

Results
Complete follow-up was available for 14 participants. Median [IQR] adherence increased significantly after provision of the indoor footwear from 67% [53%-71%] at baseline to 79% [65%-87%] after one month and 89% [69%-93%] after 12 months (P<0.001). This was due to a significant increase in indoor adherence (baseline 46% [21%;-62%]; 1 month 72% [52%-86%]; 12 months 82% [55%-91%] (P<0.001)). Outdoor adherence increased non-significantly (baseline 92% [84%-100%]; 1 month 98% [93%-100%]; 12 months 99% [95%-100%] (P=0.1)).

Discussion and conclusion
Provision of custom-made indoor footwear significantly increases short and long-term footwear adherence for people at high-risk of diabetic foot ulceration who are non-adherent to wearing regular custom-made footwear.

Clinical message
The combination of custom-made indoor and regular footwear is expected to reduce the risk of foot ulceration in people with diabetes at high risk. Prescription and reimbursement should be considered for clinical practice.

P36

Development of a remote handling concept-based task-oriented arm training in stroke: a pilot study

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Introduction
In stroke patients, arm-hand skill performance (AHSP) training may be assisted using new technologies. However, current technology-assisted (TA) arm-hand treatment effect sizes are still low, one potential reason being sub-optimal use of the patient's brain plasticity in TA training. A new task-oriented arm training approach, featuring 'remote handling concept' technology manipulating proprioception (ReHab-TOAT), was developed and is pilot-tested.

Research Question
Research questions are: "Is the ReHab-TOAT concept feasible in a rehabilitation centre context?"; and "What is the order-of-magnitude of the possible benefit of ReHab-TOAT on improving AHSP in both subacute and chronic stroke patients with either a severely or moderately affected arm-hand?"

Methods
This prospective cohort study, featuring pre-post measurements, involves 5 subacute and 5 chronic hemiparetic stroke patients. Participants receive ReHab-TOAT for 6 weeks, 3x/week, 1.5 hr/day additional to therapy-as-usual. ReHab-TOAT contains task-oriented arm training for stroke patients in combination with haptic feedback, generated by a remote handling device to provide augmented task-related proprioceptive information. Outcome measures: ARAT, Fugl-Meyer Assessment, ABILHAND.

Expected contribution to research and clinical practice
Data of this study will be used for a group size calculation for an ensuing RCT to test effectiveness of ReHab-TOAT.
Patients will receive arm training that may be more efficacious, leading to better/faster improvements in AHSP. ReHab-TOAT contains a high variability as to exercises and valuable training content, offering the possibility for patients to train in a motivating way for a prolonged time, and making ReHab-TOAT appealing for a large group of patients, like patients with stroke.

P37

Walking adaptability in polio survivors: a comparison with healthy age-matched individuals

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Introduction Falling is a major health problem for polio survivors and occurs mostly after slips, trips or missteps. This suggests reduced walking adaptability. Identification of fall-risk factors is essential to reduce falling, but these are currently identified through functional balance tests that do not address walking adaptability. A treadmill with projected targets and obstacles could help to assess walking adaptability.
Objective To compare walking adaptability, measured as stepping accuracy and obstacle avoidance, between polio survivors and healthy controls.
Methods Forty-six polio survivors (mean±SD age: 63.2±8.8 years) reporting at least one fall per year and twenty-five healthy controls (age: 64.3±6.6) performed walking adaptability tests on the C-Mill at fixed self-preferred treadmill walking speed. Target stepping accuracy was assessed in three conditions (0%, 20% and 30% variation in targets; measured as variable error (VE; mm) of foot-to-target distances), and obstacle avoidance in two conditions (anticipatory and reactive; measured as percentage avoided).
Results Treadmill walking speed was lower for polio survivors than for controls (0.64 vs. 0.97 m/s, $p<0.001$). Still, polio survivors stepped less accurately onto targets (0%, 20%, 30%: mean±SD VE=31±9 mm, 39±12 mm, 43±15 mm) and avoided fewer obstacles (83±20%, 59±29%) than controls (VE=28±5 mm ($p=0.101$), 33±6 mm ($p=0.005$), 38±7 mm ($p=0.037$); obstacles: 100±2%, 94±16%, $p<0.001$).
Conclusion As expected, polio survivors demonstrated poorer walking adaptability than controls, with especially limited reactive obstacle avoidance.
Clinical message Reduced walking adaptability may be linked to increased fall risk in polio survivors and should therefore be evaluated as fall risk factor.

P38

Patient perspectives on risk factors for musculoskeletal complaints in a population with upper limb absence

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Introduction: Musculoskeletal complaints (MSCs) are highly prevalent amongst individuals with upper limb absence (ULA). Cross-sectional observational studies have described several possible risk factors for the development of MSCs, but the experiences and opinions of patients themselves are underexposed. Patients' perspectives may disclose important factors for the prevention and treatment of MSCs in this population.
Objective: To investigate patients' perspectives on factors involved in the development and persistence of MSCs.
Patients: Adult individuals with ULA: acquired amputation or congenital deficiency.
Methods: During a focus group session, open questions were asked addressing MSCs and possible risk factors for MSCs. Based on the session's transcript, a framework was built by formulating (sub)categories of risk factors in an inductive way. The final set of categories was entered in the Atlas.ti software to identify sections of the transcript corresponding to a (sub)category.
Results: Eleven participants contributed to the focus group session, of which three experienced no MSCs and eight had MSCs in the previous year. Participants' opinions were expressed in five main categories containing a total of 29 subcategories. The main categories were: activities, psychology & cognition, environment, prosthesis-related and general.
Discussion and conclusions: Participants mostly mentioned factors that could be placed in the categories 'activities' and 'psychology & cognition'. The literature on these categories is limited and results could therefore not be embedded in this specific field of knowledge.
Clinical message: The knowledge on population-specific risk factors for MSCs needs to be enlarged in order to treat MSCs more effectively and reduce disability.

P39

A LivingLab to develop New Interventions in a Clinical Environment for Active Living and Lifestyle (NICE4ALL)

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Topic
Despite intensive rehabilitation programs in medical rehabilitation centres, patients are often sedentary outside their treatment programs. Basalt aims to provide a physical environment that appeals and challenges patients to be more physically active. This supports patients to attain a more active lifestyle during and after their rehabilitation treatment.

Relevance
An active lifestyle improves the outcomes of rehabilitation and helps to prevent health problems in the future. A LivingLab provides a physical location inside our rehabilitation centre to develop, test and evaluate innovations with different stakeholders to find out what works best for a more active lifestyle in a real-life setting.

Current status
Basalt rehabilitation recently established a LivingLab for the NICE4ALL project. The LivingLab consists of a ±400 m2 multi-purpose, open space inside the heart of the rehabilitation center, including a SmartHub that serves as a 'LivingLab control room'.
So far this project achieved a:
-plan of action including requirements and conditions for the LivingLab,
-Community of Practice (CoP) with patients, health professionals and other stakeholders,
-shortlist of high-potential innovations to support an active lifestyle.

Moreover, the following has been implemented in the LivingLab: the 'Active Floor' to improve physical and cognitive skills, an interactive 86" touchscreen to provide lifestyle information and exercises, and the ' Fietslabyrinth'. Other innovations will follow soon.

Plan of action
In collaboration with different stakeholders innovative projects to attain/maintain an active lifestyle will start. Research projects evaluate both process and outcomes of innovations in a clinical environment to support active living and lifestyle.

P40

Measuring self- regulation as rehabilitation outcome: What is important?

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Introduction: Self-regulation means the ability to have control. While self-regulation is conditional for independent living and is embedded as a rehabilitation goal, it is often neglected as outcome measure. Besides, it is unknown how self-regulation can be measured best.

Objective: To explore the aspects of self-regulation that are important in relation to measurement of rehabilitation outcomes according to former patients, and which existing measurement instruments can be used in rehabilitation practice.

Patients: Forty participants in seven diagnosis-related focus groups, namely amputation (n=5), neurological diseases (n=6), chronic pain disorder (n=3), musculoskeletal disorder (n=8), spinal cord injury (n=4), acquired brain injury (n=7), and oncology (n=7).

Methods: Qualitative exploration based on content analysis of the focus group discussions and a narrative review of measurement instruments on self-regulation.

Results: Six important aspects emerged: 1) gaining insight in physical and cognitive impairments, 2) gaining insight in the effects of impairment and restrictions, 3) gaining insight in own possibilities, 4) knowing and communicating own boundaries, 5) Trust in own body and in own functioning, and 6) to make use of own possibilities. Fifteen measurement instruments were identified and screened on content. No instrument covered all six aspects.

Discussion and conclusions: Six important aspects of self-regulation, by the meaning of former patients, were identified. No single instrument exists that covers all aspects to measure self-regulation as rehabilitation outcome.

Clinical message: Self-regulation forms a key element in rehabilitation. Six important aspects of self-regulation were identified for clinical rehabilitation practice.

P41

Investigation of bias due to loss of participants in the HandbikeBattle: Understanding the reasons for dropping out

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Introduction
The HandbikeBattle (HBB), a challenging handcycle event, incites people with lower-limb impairment to sports. Previous HBB studies have shown beneficial effects in participants on physical fitness and quality of life. However, some participants drop out during the training period, possibly influencing results from this cohort.

Objectives
1. Investigate the number and reasons for drop-out before the HBB.
2. Investigate possible differences between competitors and drop-outs.

Participants
330 subjects with lower-limb impairment and handcycling ambitions, recruited from 12 rehabilitation centres in the Netherlands.

Methods
Data including participant characteristics, physical fitness and mental health were collected before the start of the training period (T1). The primary outcome measures (number and reason for drop-out) were reported two weeks before the HBB.

Results
66 Participants (20%) dropped out after T1. The primary reason for dropout was health condition (n=35; 53%), followed by lack of motivation (n=17; 26%). There were no significant differences in physical capacity, disability or mental health between the groups at T1. However, a significantly lower participation in sports before enrolment was found in the drop-out group (3.6 ± 0.5 hours per week) vs. the competitors (5.2 ± 0.3; p=0.016).

Discussion and conclusions
Thorough screening, including history of sport participation in relation to health and motivation, could influence success rate. No attrition bias was found for personal and disability characteristics other than sports participation.

Clinical message
To improve the experience of participants who have less acquaintance with sports, professionals should monitor their health condition and motivation throughout the training period.

P42

Characteristics of aerobic and resistance exercise during rehabilitation of patients with acquired brain injury

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Introduction
Training of physical fitness is part of rehabilitation for patients with acquired brain injury (ABI). However, training characteristics may be sub-optimal.

Objective
To monitor the characteristics of aerobic and resistance exercise during rehabilitation of patients with ABI and compare these to existing guidelines.

Patients
Ten patients with ABI (46 ±14 years) recruited within Merem rehabilitation.

Methods
Aerobic and resistance exercise was monitored for patients who performed bootcamp (n=3), fitness (n=7) or both (n=1). The heart rate (HR) at ventilatory threshold (VT) and respiratory compensation thresholds(RCT), determined during a graded (sub)maximal exercise test, were used to categorise aerobic exercise as low (HR<VT), moderate (VT<HR<RCT), or high (HR>RCT) intensity. Intensity of resistance exercises was expressed as % of one repetition maximum (1-RM). Besides, frequency (session/week), session duration, and volume of the strength exercises were monitored.

Results
Participants spent on average only 12±6min (bootcamp) and 7±8 min (fitness) in moderate intensity aerobic exercise. High intensity was performed for only 5±8 min and 2±3 min respectively. Only 3 participants approximated guidelines of 20 min moderate/high intensity exercise.
Three of six participants approximated the guidelines for increasing strength, i.e. exercised >50% of their 1-RM with an adequate volume. None of the participants trained frequent enough to meet the guidelines for increasing aerobic capacity or strength.

Discussion and conclusions
Characteristics of physical fitness training in patients with ABI during rehabilitation do not meet the guidelines for improving aerobic capacity and strength.

Clinical message
Personalised monitoring may help to improve training programs of patients with ABI.

P43

Are self-reported red flags valid screeners for specific spine pathology in patients with chronic low back pain in tertiary care?

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Introduction:
The use of red flags (RF) is strongly recommended in many guidelines to identify specific spinal pathology in 1-5% of patients with Low Back Pain (LBP) . The validity of self-reported RF questionnaires as an initial screening in tertiary care however is currently unknown.

Objective:
To determine whether self-reported RF questionnaires are valid screeners to identify possible specific pathology.
Patients: 150 consecutive patients with chronic low back pain (>6weeks) admitted to the Groningen Spine Cohort (Groningen Spine Centre) were included.

Methods:
Retrospective cohort study. RFs were assessed in a baseline questionnaire. Final diagnoses were extracted from medical charts and categorized as: malignancy, lumbar radicular syndrome (LRS), spondyloarthropathy, fracture, or multifactorial back pain (MBP, nonspecific). Sensitivity and specificity for all RF questions were determined in relation to the specific spinal diagnosis category.

Results:
Of 150 patients 127 were eligible for analysis (male 39%). Seventeen percent of patients were diagnosed with specific pathology and 24 RFs were analyzed. Ten out of 18 patients with LRS had 1 out of 3 positive RFs, while for LRS leg pain was the only RF with acceptable diagnostic power (sensibility 78%, specificity 72%).

Discussion and conclusions:
In this study few patients had specific pathology. As a result, the diagnostic power of most of the self-reported RFs is low. Furthermore, there is a high false-positive rate in patients with MBP.

Clinical message:
Most self-reported red flags do not seem to be valid screeners for specific spine pathology in patients with chronic back pain in tertiary care.

P44

ActiFeeT: Lessons to be learned from a Pilot Study on a Biopsychosocial Rehabilitation Treatment in patients with Painful Diabetic Neuropathy.

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Objective: to evaluate the effectiveness of personalized exposure therapy (EXP) on improving physical activity and quality of life (QoL) in patients with painful diabetic neuropathy (PDN).
Patients: 12 PDN-patients; age>18 years, Diabetes Mellitus Type II, Clinical Neurological Examination, CNE>5, Diabetic Neuropathy Symptom Score, DNS≥1 and Douleur Neuropathique 4 Questions, DN4≥3.
Methods: Randomized replicated sequential single-case experimental ABC-design. EXP intervention: intensive screening by rehabilitation team, followed by 8-week EXP, specifically adapted to the needs/risks of PDN patients. Outcome measures included indices of physical activity, QoL, metabolic parameters, disability, depression, general and PDN related anxiety, pain intensity and pain catastrophizing.
Results: The screening resulted in a drop-out rate of 50% due to: lack of desire for improving daily life functioning (n=1), comorbidity (n=1) , not experiencing the pain as main interference in daily life (n=4). During EXP, 2 drop-outs occurred due to adverse events and 1 because of unavailability. Only slight non-significant improvements were observed on disability and physical activity in the 3 participants that completed the study.
Conclusions: Analyses of the high drop-out rates indicate that focussing on pain alone may be a limited approach to improving QoL and disability in patients with PDN as all other comorbid problems are not addressed. A more integrated and holistic approach to diabetes and its complications seems to be needed. Future studies on biological, psychological and social factors in the context of neuropathic pain, and more specific PDN, are needed to support the design and evaluation of treatments for individuals suffering from PDN.

P45

Does it stop with improved function? Well prepared home! A study into the generalization of learned communication skills into everyday situations in aphasia

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Introduction
To optimize communication in daily situations, generalization of what people with aphasia (PWA) have learned in the therapeutic setting to the daily situation is necessary. Speech therapy generally focusses on improving function instead of participation. To improve communication in daily life, insight into the experience of generalization and factors of influence is needed.

Objective
To investigate experiences of PWA and their relatives on the generalization of learned communication skills to everyday situations.

Patients
4 PWA and 3 relatives of PWA, at least one month of speech therapy treatment at Tolbrug. PWA must have been at home for at least 3 weekends. Relatives of PWA must have been present during therapy at least 5 times.

Methods
A qualitative study through semi-structured interviews.

Results
Participants experience an improvement of function over time. They indicate that communication is influenced by situation complexity and degree of familiarity with the conversation partner. Participants experience peace, patience and positive dealing with aphasia as facilitators for communication in daily living and point out that tips and techniques given in therapy are valuable. However PMA do not experience optimal generalization and indicate that more practice in complex situations is needed.

Discussion and conclusions
Generalization of communication skills could be optimized. The complexity of the situation and the relationship with the conversation partner play a role in the success of generalization.

Clinical message
Awareness for complex situations and the role of the partner in treatment could be important to improve generalization. Research into which factors influence generalization is needed in order to better align therapy.

P46

Duloxetine in osteoarthritis (doa) study: effects of duloxetine on pain and function in end-stage hip and knee OA – a pragmatic enriched randomized controlled trial

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Introduction
Some osteoarthritis (OA) patients experience inadequate pain relief from analgesics like acetaminophen and nonsteroidal anti-inflammatory drugs. This could be the result of experienced non-nociceptive centralized pain. Placebo-controlled randomized trials (RCT) have proven the effectiveness of duloxetine for OA and several chronic pain conditions where central sensitization (CS) is one of the key underlying pain mechanisms.

Objective
To assess the efficacy of an 8-week duloxetine treatment compared to usual care in end-stage knee and hip OA patients with a level of centralized pain (CS).

Patients
This pragmatic, enriched, open-label RCT included primary knee and hip OA patients who experienced OA-pain with neuropathic-like symptoms (at risk of CS).

Methods
Patients were randomized to duloxetine or to care-as-usual. Primary outcome was pain in the index joint, measured with the pain domain of the Knee/Hip injury and Osteoarthritis Outcome Score (KOOS/HOOS). The intention-to-treat principle was used, with mixed-model repeated measures to analyze the effect.

Results
111 patients were randomized. Nearly 44% felt much to very much better after duloxetine usage compared to 0% in the care-as-usual group. The duloxetine group scored 6.8 points better on the pain domain of the KOOS/HOOS (p=0.003). Knee patients improved significantly more than hip patients (10.86 [p<0.05] versus 1.47 points better [p=0.65]).

Discussion and conclusions
This study found that adding duloxetine treatment seems to be beneficial for end-stage knee OA patients with neuropathic-like symptoms (at risk of CS). Hip OA patients seem to be nonresponsive to duloxetine.

Clinical message
A more customized treatment for the underlying pain mechanism seems to be beneficial for end-stage knee OA patients

P47

Effectiveness of cognitive behavioral therapy - module addressing the role of the social environment - on perceived social support in fatigued patients with multiple sclerosis

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Introduction:
During cognitive behavioral therapy (CBT) for MS-related fatigue, social support is specifically targeted if patients experience problems in this domain. However, it is not known whether perceived social support indeed improves in patients who are treated with this social support module (SSmod).

Objective:
To study whether perceived social support improves during CBT for MS-related fatigue in patients who experience reduced social support.

Patients:
91 patients with MS-related fatigue.

Methods:
Secondary analysis of a randomized clinical trial (TREFAMS-CBT). Participants with MS-related fatigue were randomly assigned to CBT (n=44) or MS nurse consultations (n=47). CBT consisted of 12 patient-tailored sessions with a trained psychologist, control treatment of 3 consultations with an MS nurse. Primary outcome is the social support list (SSL- interactions/discrepancies/negative interactions). Questionnaires were completed at baseline, 8, 16 (i.e. post-intervention), 26, and 52 weeks. CBT SSmod was indicated when the baseline scores on the social support list were: SSL-Discrepancies ≥ 50 and/or SSL-Negative Interactions ≥14. Data were analyzed with General Linear Models.

Results:
Four groups were compared: 1) CBT SSmod not indicated (n=22); 2) CBT SSmod indicated and given (n=22); 3) control treatment SSmod not indicated (n=31) and 4) control treatment SSmod indicated but not given (n=15). No clinically or statistically significant between-group effects were found.

Discussion and conclusion:
CBT module addressing social support did not improve perceived social support in fatigued patients with multiple sclerosis.

Clinical message:
If one of the goals is to positively affect perceived social support, this CBT module seems not necessary.

P48

Musculoskeletal complaints in patients with major congenital longitudinal upper limb differences

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Introduction:
Congenital upper limb anomaly (CULA) is rare condition with a prevalence ranging between 10-30/10.000. Relative overuse of the affected limb(s) and/or contralateral limb can lead to musculoskeletal complaints (MSCs).

Objective:
(1) To determine the prevalence of MSCs in patients with major CULA other than the transverse type, (2) to assess the health status of patients with major CULA in general and in relation to the presence of MSCs, and (3) to explore the predictors of development of MSCs and MSC-related disability.

Patients:
71 adult patients with major CULA and 71 matched controls (mean age 28.8yrs SD; 8.9yrs, 40% men).

Methods:
Design: Cross-sectional study: national survey (response rate 40%). Setting: Three outpatient rehabilitation clinics. Interventions: None. Main Outcome Measures: Point and year prevalence of MSCs, MSC-related disability (Pain Disability Index), general health perception and mental health (RAND-36 subscales).

Results:
Point and year prevalence of MSCs was higher in patients than in the matched control group (34 versus 23% and 35 versus 18%, respectively). Year prevalence showed a significant difference (p=.023). No significant difference between MSC-related disability was found between the groups. Perceived general health was similar. Patients scored lower on mental health (p=.007). Further multivariate analysis to determine predictors of MSCs is in progress.

Discussion and conclusions:
Presence of MSCs is a frequent problem in patients with major CULA. These patients report lower mental health.

Clinical message:
Be aware of MSCs in major CULA; further research can be directed on mental health, prevention and/or early detection.

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Assessing Central Sensitization in patients with Chronic Low Back Pain; comparing Quantitative Sensory Testing, Heart Rate Variability and Central Sensitization Inventory

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Poster sessie, November 12, 2020, 4:05 PM - 4:45 PM

Introduction
Central sensitization (CS) is a state of hyper excitability of the central nervous system. There is no gold standard to measure CS. Measurement instruments related to CS are Quantitative Sensory Testing (QST), Heart Rate Variability (HRV) and Central Sensitization Inventory (CSI). The association between these instruments is unknown for patients with Chronic Low Back Pain (CLBP).

Objective
To analyze the association between QST, HRV and CSI in patients with CLBP.

Patients
N=73 patients (mean ± SD age = 40.8 ± 12.3 years, N (%) females = 44 (60%)) with CLBP admitted to Pain Rehabilitation.

Methods
All three measures were applied concurrently. Patients underwent QST for Dynamic Mechanical Allodynia (DMA), Mechanical Detection Threshold (MDT), Mechanical Pain Threshold (MPT), Pressure Pain Threshold (PPT) for 6 body sites and Conditioned Pain Modulation (CPM) for 2 sites. HRV parameters: mean heart rate (MeanHR), mean inter-beat interval(RR), SD of the normal-to-normal interval (SDNN), root mean square of successive differences (RMSSD) and Normalize Coherence Score. CSI parameters: part A and B. Statistics: Spearman correlation coefficients (r; $p<0.05$).

Results
The PPT Quadriceps contralateral was associated with CSI-A (r=-0.28), the CPM Quadriceps with Normalized Coherence (r= 0.25) and CPM Deltoid with SDNN (r=-0.27) and with RMSDD (r=-0.25). All other associations were not significant.

Discussion and conclusions
Associations were weak or nonexistent.

Clinical message
QST, HRV and CSI measure different manifestations of CS in patient with CLBP. No single instrument can by itself measure all manifestations of CS.

P50

Non-pharmacological Treatments And Effectiveness On SCI-related Pain. A Cross-sectional Survey Study In Persons With a Spinal Cord Injury, living In The Netherlands

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Introduction
Chronic pain is a common secondary condition in spinal cord injury (SCI), with an impact on physical, cognitive, and emotional wellbeing. SCI-related pain can be distinguished into nociceptive and neuropathic pain. Pharmacological interventions to reduce the pain are associated with an increased risk of side effects, and reported effects of non-pharmacological treatments are unclear.

Objective
This study aims to get insight into the amount of non-pharmacological treatments used per pain condition, and the effect of commonly used non-pharmacological treatments in daily practice on the different pain conditions.

Patients
Former rehabilitation patients from two Rehabilitation Centres in the Netherlands

Methods
A cross-sectional survey is sent between July 2016 and July 2018.

Results
A total of 371 participants returned the questionnaire. 262 participants experienced pain following SCI. Neuropathic pain was reported most often (74.4%), followed by musculoskeletal pain (51.5%). Of patients with pain, 78.2% reported past or current use of non-pharmacological treatments. Most non-pharmacological treatments used were physiotherapy (48.5%), exercise (39.5%), cannabis (19.5%), and massage (17.2%). For all pain conditions, most positive effects were reported for exercise and physiotherapy. For musculoskeletal pain, massage was also reported as effective. For neurological pain, TENS was also reported as effective.

Discussion and conclusions
People with SCI who experience pain often use non-pharmacological pain interventions. The most used are exercise, physiotherapy, cannabis, and massage. This study showed that exercise and physiotherapy are most often perceived as effective, without a difference between the different pain conditions.

Clinical message
More comparative research is needed into the effectiveness of non-pharmacological interventions.

P51

Neuropathic pain in spinal cord injury and its evolution in time

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Introduction
Neuropathic pain might be better distinguished into different clinical phenotypes than in at- level and below level pain in spinal cord injury, because of its heterogeneity and therefore relative unresponsiveness to treatment.

Objective
To get more insight into neuropathic pain after spinal cord injury and its underlying mechanisms by assessing anamnestic neuropathic (pain)symptoms and their evolution in time.

Patients
225 patients with recent spinal cord injury.

Methods
Patients rated the occurrence and severity of “pain other than musculoskeletal pain” and 7 neuropathic symptoms with self-reported questionnaires at the start of active rehabilitation (T1), 3 months later (T2), at discharge (T3), 1 year after discharge (T4) and 5 years after discharge (T5). Generalized Linear Models (GEE) and Mixed model analyses were performed to assess prevalence and the course of neuropathic pain.

Results
Tingling, cold, numbness and girdle zone pain were reported most. Prevalence and severity of neuropathic symptoms seem relatively stable over time. Prevalence of numbness increases and girdle zone pain decreases over time.

Discussion and conclusions
Neuropathic pain remains relatively stable over time. Notable is that a substantial part of patients who reported no “other pain” do report neuropathic sensations, but apparently do not describe these as being painful.

Clinical message
Perhaps in studies and questionnaires “neuropathic sensations” should be assessed instead of “neuropathic pain” in order to get a complete picture.

P52

What do I miss?? – Extrapersonal neglect at the GRAIL, a feasibility study

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Neglect is a common consequence of unilateral brain damage, especially after right hemispheric stroke. Visuospatial neglect is the most common form of neglect and tested by pencil and paper tests, in a quiet and controlled setting. However this is not how it works in real life. Besides that, extrapersonal neglect isn't tested at all.
Therefore a new application for the GRAIL , the FEPSNeT, was developed by W. Sauter at MRC Aardenburg. This is a test where people tap birds at a big curved screen while standing or walking in a virtual wooded area.
At rehabilitation center Klimmendaal, we tested 12 in-center adult patients with a first right hemispheric stroke during a feasibility study, in the context of a multi-center research. We wanted to see how many patients actually show signs of extrapersonal neglect by comparing the reaction time for the left and right side of the screen, and if there is a relation between this test and the items 7-10 of the Catherine Bergego Scale (CBS), which correspond with extrapersonal neglect.
Seven patients showed a slower reaction time at the left, which was more pronounced by walking in 6/7 patients. Moreover, people with a score ≥1 at item 7-10 of the CBS were even slower at the left side. The number of patients of this pilot study is too small to further draw conclusions. But it seems that the FEPSNeT is a potential good new instrument to look for extrapersonal neglect, which needs to be further investigated.