Programma Online DCRM 2021

Donderdag 11 november 2021

Tijdstip	Programma onderdeel
11.45 - 12.30	*Lunchsessie sponsors:* **Ipsen** en **Will Pharma**
12.30 - 13.00	Inloop online DCRM 2021
13.00 - 13.05	Start congres
13.05 - 13.35	**Plenaire spreker 1: Jeroen Tas**
13.35 - 13.50	**Poster pitches van top 8 beste posters**
13.50 - 14.10	Pauze - *Netwerkcarroussel*
14.10 - 15.10	**Parallel sessie A: workshops en mini-symposia**
15.15 - 15.45	**Plenaire spreker 2: Ruud Selles**
15.45 - 16.05	Pauze
16.05 - 16.45	**Poster sessie**
16.15 - 16.35	Speeddaten met commissieleden van de VRA: • Beroepsbelangen Commissie • Commissie Kwaliteitsbeleid • Commissie Kwaliteitsvisitaties
16.50 - 17.50	**Parallel sessie B: PhD sessie en free paper sessies**
17.50 - 17.55	Afsluiting dag 1 congres
17.55 - 18.25	• *Netwerkcarroussel*

Vrijdag 12 november 2021

Tijdstip	Programma onderdeel
8.45 - 9.00	Inloop online DCRM 2021
9.00 - 9.05	Opening congres dag 2
9.05 - 10.05	**Parallel sessie C: workshops en mini-symposia**
10.05 - 10.25	Pauze • *Netwerkcarroussel*
10.25 - 10.55	**Plenaire spreker 3: Heike Vallery**
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 en Revalidatie jaarprijs 2021**
12.30 - 13.00	**Plenaire spreker 4: Hans Rietman**
13.00 - 13.05	Afsluiting congres
13.05- 13.30	• *Netwerkcarroussel*

Leerdoelen:

- Nieuwe ontwikkelingen op het gebied van de revalidatiegeneeskunde identificeren
- Zorgprofessionals informeren over lopende wetenschappelijke onderzoeken op het gebied van de revalidatiegeneeskunde
- Vaardigheden oefenen in praktische workshops
- Kennis en ervaringen uitwisselen met collega's

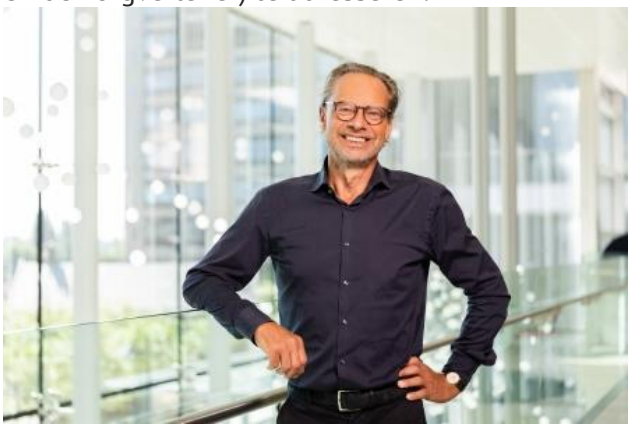
Plenaire sprekers

- Jeroen Tas
- Prof. dr. Ruud Selles
- Prof. dr. ing. Heike Vallery
- Prof. dr. J.S. (Hans) Rietman

Jeroen Tas

Waar, wanneer en hoe gaan we de digitale transformatie in de gezondheidszorg ervaren?

De gezondheidszorg ondergaat de komende jaren een onvermijdelijke transformatie, onherkenbaar van hoe we het nu kennen. Welke trends zorgen ervoor dat deze transformatie nodig is en ook mogelijk wordt gemaakt? Hoe zien goed-presterende gezondheidssystemen van de toekomst eruit? Jeroen Tas, verantwoordelijk voor Strategic Business Development bij Philips en voormalig Chief Innovation & Strategy Officer van Philips, kijkt tijdens deze presentatie naar deze thema's en onderzoekt hoe digitale technologie, platformen en ecosystemen kunnen helpen om zo de Quadruple Aim (betere behandelresultaten tegen lagere kosten en het verbeteren van de ervaring van de patiënt en de zorgverlener) te adresseren.



Jeroen Tas is verantwoordelijk voor Strategic Business Development bij Philips en voormalig Chief Innovation & Strategy Officer van Philips. Hij heeft meer dan 35 jaar internationale ervaring als ondernemer en executive in de gezondheidszorg, informatie technologie en financiële dienstverlening.
Bij Philips is Jeroen nauw betrokken bij de strategie van het bedrijf, platforms, ventures en emerging businesses. In zijn huidige rol in Strategic Business Development speelt hij een centrale rol in het coachen van digital business ventures en leiderschap en is hij betrokken in strategische projecten gericht op nieuwe modellen van gezondheidszorg waarin de patiënt centraal staat. Daarbij zet hij zijn kennis van opkomende technologieën zoals kunstmatige intelligentie, robotics en het Internet of Things in om de oplossingen die het bedrijf biedt in de gezondheidszorg, gericht op het ondersteunen van consumenten, zorgverleners en gezondheidssystemen met gepersonaliseerde en connected oplossingen, te versterken.
Jeroen's visie op gezondheid en gezondheidszorg is duidelijk zichtbaar in Philips' missie om het leven van miljarden mensen te verbeteren door betere gezondheidszorg mogelijk te maken tegen lagere kosten; van gezond leven en preventie tot diagnose, behandeling en thuiszorg.

Prof. dr. Ruud Selles

De technologie van datagedreven revalidatie; een win-win voor de kwaliteit van zorg en wetenschap
Datagedreven revalidatie heeft de potentie van betere behandelresultaten tegen lagere kosten, aansluitend bij de wensen van de individuele patiënt. In data-gedreven revalidatie worden data uit verschillende bronnen gecombineerd om de zorg te ondersteunen. Te denken valt aan EPD-data, patiënt-gerapporteerde data (PROMS, PREMS, screening tools), diagnostische data (zoals beeldvorming, gangbeeldanalyse) en sensor data (bijvoorbeeld activiteitmonitoring).

Data zijn een cruciaal onderdeel van value-based healthcare en van patient-centered care. De juiste data stellen een behandelaar in staat om samen met de patiënt te kiezen voor de beste behandeling, op basis van beschikbare evidentie, persoonlijke omstandigheden en historische 'patients-like-me' data. Maar dezelfde data kunnen ook de aansturing van zorg verbeteren en bieden een unieke kans voor revalidatieonderzoek.

Maar het succesvol toepassen van datagedreven revalidatie staat nog in de kinderschoenen. Hoe verzamel je al deze data op een praktische en haalbare manier in de dagelijkse klinische praktijk? Hoe kun je deze data gebruiken om individuele zorg te optimaliseren? En welke kansen zijn er voor wetenschappelijk onderzoek als deze data beschikbaar zijn?

In deze presentatie vertelt Ruud Selles over zijn betrokkenheid in het Erasmus MC, Rijndam Revalidatie en Xpert Clinic bij het opzetten van gestructureerde informatieverzameling in de zorg, waaronder het verzamelen van patient-reported outcome measures. Hij zal vertellen over nu al beschikbare technologie om deze data te verzamelen, te integreren in concrete zorgtoepassingen, over de unieke data die dit oplevert voor het doen van wetenschappelijk onderzoek en over de uitdagingen van deze aanpak voor de toekomst.

Ruud Selles is hoogleraar aan het Erasmus MC bij de afdelingen Revalidatiegeneeskunde en Plastische Chirurgie. Hij is opgeleid als bewegingswetenschapper in Amsterdam en gepromoveerd aan de afdeling revalidatiegeneeskunde van het Erasmus MC. Na terugkeer van een fellowship aan het Rehabilitation Institute of Chicago leidt hij een onderzoeksgroep op het gebied van handchirurgie en handrevalidatie met interesses in neurorevalidatie en musculoskeletale aandoeningen. Sinds 2021 bekleedt Ruud een leerstoel over geïndividualiseerde behandeling van de bovenste extremiteit. Zijn ambitie is om met innovatieve onderzoeksbenaderingen betere manieren te vinden om aandoeningen van de bovenste extremiteiten te behandelen en deze benaderingen ook toe te passen in andere revalidatie onderzoeksgebieden.
In de afgelopen jaren heeft hij een fundamenteel andere aanpak ontwikkeld door klinische gegevens te verzamelen in de dagelijkse praktijk en deze te analyseren met behulp van innovatieve statistische en data science technieken. Om dit te doen heeft zijn groep:
1) Slimme verzamelbenaderingen ontwikkeld voor om klinische data in de dagelijkse zorgpraktijk te meten, zowel behandeluitkomsten en prognostische markers
2) vergelijkende effectiviteitsstudies uitgevoerd met deze klinische data om de variabiliteit in

behandelingseffecten te analyseren en behandelingsopties te vergelijken
3) klinische voorspellingsmodellen ontwikkeld om verschillen in individuele respons op behandeling te evalueren en te voorspellen

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Prof. dr. ing. Heike Vallery

Uitdagingen en kansen om technologie voor loop- en balanstraining naar de klinische praktijk te brengen

Menselijk lopen en evenwicht zijn verbazingwekkende motorische taken waarbij het hele lichaam en complexe neuromotorische controle betrokken zijn. Voor het trainen of ondersteunen van deze vaardigheden is veel technologie ontwikkeld. Alleen de overgrote meerderheid van deze apparatuur blijft hangen in het stadium van onderzoeksprototype. Slechts een klein aantal maakt de sprong naar de klinische praktijk.

In deze talk zal zij terugkijken op welke technologie uit haar eigen onderzoek wél en niet uiteindelijk beschikbaar is geworden voor patiënten, buiten klinische studies. Onder de vier voorbeelden voor technologie die de sprong naar de markt wél heeft kunnen maken is de RYSEN revalidatierobot, waarmee veilig loop- en balanstraining in een grote 3D-ruimte mogelijk wordt. Een ander voorbeeld zijn valdetectie-algoritmen voor de WOLK airbags, die nu al iedere dag de heupen van meer dan duizend oudere gebruikers beschermen. Ook enkele voorbeelden voor gefaalde tech transfer worden bekeken, waaronder een aangedreven knie-exoprothese, en een mechanisch gewichtsondersteuningssysteem. Uit de vergelijkende analyse van deze projecten wordt vervolgens een aantal cruciale succesfactoren afgeleid. De meest belangrijke factoren spelen al vanaf het begin van een project, zoals aanwezigheid van sterke trekkers aan de klinische kant.

De talk zal sluiten met een inkijk in actueel draaiende projecten die gedreven zijn vanuit klinische vraagstellingen.

Heike Vallery is hoogleraar aan de TU Delft en werkt aan minimalistische en onconventionele concepten om het menselijk lopen en evenwicht te ondersteunen. Sinds november 2019 is zij ook honorair hoogleraar bij de afdeling revalidatiegeneeskunde van het Erasmus MC in Rotterdam. Tijdens haar gehele wetenschappelijke carrière, in Nederland en ook al eerder bij TU München, ETH Zürich, en Khalifa University in Abu Dhabi, werkt ze aan robotgeassisteerde revalidatie en prothetische benen, in nauwe samenwerking met clinici en partners uit de industrie. Heike Vallery heeft een uitstekende track record op het gebied van technologieoverdracht en impact in de echte wereld, met name in de vorm van vier verschillende systemen op de markt die al gebruik maken van haar octrooien en octrooiaanvragen ten voordele van personen met een motorische stoornis. Zij ontving talrijke beurzen en prijzen, zoals de 1e prijs van de euRobotics Technology Transfer Award 2014, en een VIDI-beurs van de Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) in 2016.

Prof.dr. J.S. (Hans) Rietman

Revalidatietechnologie ter ondersteuning van Missiegedreven gezondheid en zorg beleid

Medische technologie en ook revalidatietechnologie werden tot voor kort ontwikkeld met het primaire doel om de kwaliteit van diagnostiek en therapie te verbeteren. Deze ontwikkeling was en is sterk aanbod gericht maar heeft wel degelijk voor een verbetering van de kwaliteit van gezondheidszorg geleid.

In de komende decennia zal er een groeiende behoefte bestaan aan zorg voor de vergrijzende samenleving en mensen met een chronische aandoening. Tegelijkertijd streven die mensen naar autonomie en sociale participatie. Deze ontwikkeling heeft een impact voor de bemensbaarheid en kosten van ons zorgstelsel. In 2018 verscheen het rapport van VWS “de juiste zorg op de juiste plek” en in 2019 is door VWS de “Missie Gezondheid & Zorg” opgesteld ten behoeve van het topsectorenbeleid. Ondanks dat deze missies niet los van elkaar kunnen worden gezien is voor de revalidatietechnologie met name deelmissie 2 en 3 van belang.

2. In 2030 wordt 50% meer zorg in de eigen leefomgeving (in plaats van in zorginstellingen) georganiseerd, samen met het netwerk rond mensen
3. In 2030 is van de mensen met een chronische ziekte of levenslange beperking het deel dat naar wens en vermogen kan meedoen in de samenleving met 25% toegenomen

Nieuwe technologische innovaties binnen de revalidatie zoals actieve trainingstoestellen (robotica, virtuele realiteit), actieve hulpmiddelen (prothesen en exoskeletten), monitoring en tele-revalidatie zullen de mogelijkheden van de persoon om onafhankelijk te blijven functioneren daadwerkelijk vergroten. Het aantal medische technologieën dat in thuissituaties wordt gebruikt, zal aanzienlijk toenemen. En mogelijk het belangrijkste: de hulpvraag van de gebruiker en de maatschappelijke impact wordt sturend in de ontwikkeling van revalidatietechnologie.

Hans Rietman is revalidatiearts en hoogleraar revalidatiegeneeskunde en revalidatietechnologie aan de Universiteit Twente. Hij was van 2007 tot 2016 wetenschappelijk directeur van het onderzoeksinstituut Roessingh Research and Development in Enschede. Hij is actief betrokken bij vele (inter)nationale onderzoeksprojecten die gericht zijn op de ontwikkeling en toepassing van revalidatietechnologie in de klinische praktijk. Hij is redactielid en medeauteur van het Nederlandstalige leerboek “Revalidatie voor Volwassenen (2014)” en het boek “Revalidatie na een beenamputatie (2002,2008,2018)”. Daarnaast is hij auteur van meer dan 100 peer-reviewed wetenschappelijke artikelen. Hij is adjunct hoogleraar aan de North Western University in Chicago USA en sinds 2017 leider van het Innovative Medical Devices Initiative (IMDI 2.0) van NWO. Van 2014-2019 was hij voorzitter van de Nederlandse Vereniging van Revalidatieartsen. Op dit moment is hij voorzitter van het bestuur ICMS (interdisciplinary consortium for clinical movement sciences & technology) en is hij trekker van missie 2 (gezondheid en zorg beleid). Naast het onderzoek praktiseert hij als revalidatiearts in het orthopedieteam van Roessingh Centrum voor Revalidatie.

Parallel sessie A

Parallel session A

A1. The construct of citizenship for ageing adults with disabilities and its implications for person-centred rehabilitation medicine

PhD Sander Hilberink[1], MSc Vera van Heijningen[2], PhD Marie Sépulchre[3], MA Jacqueline Kool[4], PhD Diana Oosterveer[5], MSc Marieke van Driel[6]

[1]Rotterdam University Of Applied Sciences, [2]Research Center Innovations in Care, Rotterdam University of Applied Sciences, [3]Faculty of Social Sciences, Lund University, [4]Independent writer, researcher & self-advocate on Disability Studies, [5]Basalt Rehabilitation, [6]CP Netherlands

A1. Mini-symposium: The construct of citizenship for ageing adults with disabilities and its implications for person-centred rehabilitation medicine, November 11, 2021, 2:10 PM - 3:10 PM

Session description.
Person-centred rehabilitation takes patients' needs, experiences, preferences and cultural values into account, as well as their history and biography. For this reason, citizenship is an important aspect to consider in rehabilitation medicine. However, citizenship is a multi-layered and complex construct. Understanding the various aspects of citizenship will help rehabilitation practitioners to design and improve rehabilitation interventions and connect these not only to citizenship rights but also to the various social roles and contributions of persons with disabilities in daily life. Learning objectives include (1) Understanding how adults with disabilities relate to citizenship, (2) Knowing how citizenship is different from participation, and (3) Reflecting on how to make room for citizenship in rehabilitation practice.

Chair/Presenters.
Chair: S.R. Hilberink, PhD
Presenters.
5 minutes: Welcome and introduction - S.R. Hilberink, PhD, Research Center Innovations in Care, Rotterdam University of Applied Sciences, Rotterdam, the Netherlands

10 minutes: Citizenship according to Swedish disability activists - M. Sépulchre, PhD, Faculty of Social Sciences, Lund University, Lund, Sweden
She will present via Zoom or Teams
10 minutes: What constitutes citizenship for ageing adults with CP? - V.G. van Heijningen, MSc, Research Center Innovations in Care, Rotterdam University of Applied Sciences, Rotterdam, the Netherlands
10 minutes: Personal reflections on citizenship by an adult with a disability - J.C. Kool, MA, independent writer, researcher & self-advocate on Disability Studies.
10 minutes: The rehabilitation physician and citizenship: two worlds apart? - D.M. Oosterveer, MD PhD, Basalt Rehabilitation, Leiden, the Netherlands
15 minutes: Discussion

Outline.
In this mini-symposium, an international panel of presenters discuss research on the meaning of citizenship for adults with disabilities. We elaborate on the different dimensions of citizenship relating to the lives of adults with disabilities. While some emphasise issues concerning social justice (e.g. equality, a barrier-free context), others refer to aspects of identity, belonging, reciprocity and the role of support services. We then zoom in on how older adults with cerebral palsy define their citizenship, what factors hamper or facilitate their citizenship. A woman with a neuro-muscular disease shares her lived experiences how she shapes citizenship and what citizenship means in her life, and a rehabilitation physician discusses how citizenship can be addressed in rehabilitation consults. In the remainder of the mini-symposium, the participants discuss the importance of citizenship in their practice and are invited to reflect on ways how to incorporate attention for citizenship in their consultations.

A2. Op weg naar vergroening van de revalidatiegeneeskunde

Drs. Maaike De Koff[1]
[1]*De Jonge Specialist; Werkgroep Groene Geneeskunde*

D1. Workshop: Op weg naar vergroening van de revalidatiegeneeskunde, November 12, 2021, 11:00 AM - 12:00 PM

Sessie beschrijving + leerdoelen:
De Wereldgezondheidsorganisatie (WHO)1 en de Lancet Countdown2 noemen klimaatverandering de grootste uitdaging van de 21e eeuw. Klimaatverandering heeft negatief effect op de basiscondities van ons leven; schone lucht, veilig drinkwater, voedzaam voedsel en onderdak. Deze veranderingen veroorzaken nu al stijging van de zeespiegel, steeds vaker extreme weersomstandigheden en de toenemende verspreiding van infectieziekten. Wat gaat dit voor gevolgen hebben op de revalidatiegeneeskunde? Welke infectieziekten zullen we na de Corona-pandemie gaan zien?
De Nederlandse zorg is verantwoordelijk voor 7% van de totale CO2-uitstoot in Nederland.3 De gezondheidszorg draagt hiermee substantieel bij aan klimaatverandering. Hierdoor ontstaat een vreemde paradox, waarbij wij als zorgverleners mensen niet alleen beter maken, maar tegelijkertijd ook ziek. Dit gaat in tegen de Eed van Hippocrates, waarin we zweren niet te schaden. Er is dus voor ons als zorgprofessionals een belangrijke taak weggelegd in de strijd tegen de klimaatverandering.
Nederland committeert zich aan een afname van de CO2-uitstoot van 49% in 2030 ten opzichte van 1990. Dit betekent vanaf nu een afname van 6-8% CO2-uitstoot per jaar.3,4 Om dit te halen is nu actie nodig, en daar liggen de kansen voor de revalidatiegeneeskunde. Met competenties zoals netwerkzorg en samenwerking, het gericht zijn op de toekomst en kundig zijn in zoeken naar gezondheidsbevorderende en -belemmerende factoren, zijn revalidatieartsen hierin al goed gevormd.

Het doel van deze workshop is het aanreiken van handvatten om de revalidatiegeneeskunde te verduurzamen en te inspireren tot actie. De relatie tussen klimaatverandering en gezondheidszorg, en hoe technologie en behandelkeuzes kunnen bijdragen aan een groenere toekomst, komen hierbij aan bod.

Sprekers:
De workshop zal georganiseerd worden door de Werkgroep Groene Geneeskunde van De Jonge Specialist (DJS). DJS is de landelijke belangenbehartiger voor alle artsen (nog niet) in opleiding tot specialist (a(n)ios). DJS tekende in mei 2019 de Green Deal Zorg 2.0 (bron4) en naar aanleiding hiervan werd de Werkgroep Groene Geneeskunde is in het leven geroepen, om duurzaamheid beter op de kaart te zetten voor de achterban van DJS. De Werkgroep bestaat uit 13 a(n)ios vanuit verschillende medische specialisaties.
De Werkgroep Groene Geneeskunde verzorgde eerder onder andere vergelijkbare workshops op het MMV-congres (Modernisering Medische Vervolgopleidingen) in 2020 en het Basisartsencongres in 2021. Lid van de Werkgroep en AIOS revalidatiegeneeskunde, M.A.C. de Koff, is actief bezig het thema duurzaamheid bekendheid te geven in de revalidatiegeneeskunde en pleit daarom voor deze workshop tijdens het DCRM.

Sessie opzet:
In het eerste deel van de workshop zal achtergrond informatie worden gegeven. Dit zal bestaan uit recente gegevens vanuit literatuur over de stand van zaken van klimaatverandering. Tevens zal de relatie met de gezondheidszorg worden toegelicht. Op een interactieve manier zal het thema verdiept worden aan de hand van de pijlers van de Green Deal Zorg 2.0 (terugdringen CO2-uitstoot zorgsector; circulair werken bevorderen; medicijnresten uit oppervlakte- en grondwater terugdringen; creëren gezonde leefomgeving in en buiten zorginstellingen)4. Hiermee worden de huidige ontwikkelingen op gebied van duurzaamheid behandeld en worden voorbeelden van groene initiatieven van zorgmedewerkers gegeven.
Het tweede deel van de workshop zal bestaan uit een brainstorm sessie. Hiervoor zal de groep in kleinere groepen worden verdeeld. In deze groepen wordt gebrainstormd over ideeën om de zorg in een revalidatie instelling te verduurzamen. Vervolgens zal per groep één idee worden uitgewerkt tot een plan om dit idee te realiseren op de eigen werkvloer. Leden van de Werkgroep Groene Geneeskunde zullen de groepen een gestructureerde manier van aanpak aanbieden.

Bronnen:
1. WHO (2018) Health and Climate Change.
2. The Lancet (2019) Lancet Countdown on Health and Climate Change.
3. Gupta Strategists (2019) Een stuur voor de transitie naar duurzame gezondheidszorg.
4. https://milieuplatformzorg.nl/green-deal/

A3. mHealth-apps can improve rehabilitation care

Prof. dr. Vincent de Groot[1,2], MD Ka-Hoo Lam[2], MSc Maaike Ouwerkerk[1,2], Dr. Erwin van Wegen[1]
[1]Dept Rehabilitation Medicine, Amsterdam UMC, location VUmc, [2]MS Center Amsterdam

A3. Mini-symposium: mHealth-apps can improve rehabilitation care, November 11, 2021, 2:10 PM - 3:10 PM

In this mini-symposium various examples of recently developed mHealth applications will illustrate how we can improve patient care in rehabilitation medicine. Improvement of the diagnosis of cognitive and physical impairments, the monitoring of fatigue-related behaviour, and setting meaningful and shared treatment goals related to societal participation can all be realized with user-friendly mHealth-applications. Technical and practical details of the developmental process and validity aspects of these real-time assessments with smartphone apps in a patient-specific context will be illustrated and discussed. All apps that will be shown have been used by people with Multiple Sclerosis. The generic usability of the apps and the generalizability of the validity results for other patient groups will be explained.

Learning objectives:
- This mini-symposium allows participants to become acquainted with and gain knowledge about the various mHealth applications to improve rehabilitation care.
- Participants understand the scientific principles and methodology of studying mHealth applications and ecological momentary assessment.
- After the mini-symposium, participants can explain the links between clinical practice and technology and science with regard to patient and context-relevant data obtained with mHealth apps.

Speakers
Ka-Hoo Lam MD
Maaike Ouwerkerk MSc
Dr. Erwin van Wegen

Outline session
14.10-14.25: After a short introduction *by prof. dr. Vincent de Groot* in which he presents an overview of the technology projects (clinical and research) at the Department of Rehabilitation Medicine of the Amsterdam UMC, three presentations of 15 minutes each will follow. The mini-symposium will be concluded with a joint Q&A session.

14.25-14.40: Ka-Hoo Lam MD – Measuring cognitive and physical functions in MS with the smartphone
As technology has become inherent to our everyday lives, smartphone-based cognition and walking tests and typing on the smartphone can be utilized as digital biomarkers. In order to translate these digital biomarkers into clinical practice, the clinimetric properties are presented for these new applications in measuring and monitoring function in patients with MS.

14.40-14.55: Maaike Ouwerkerk MSc – Measuring meaningful societal participation with the Whereabouts app
Participation is often assessed in time-consuming semi-structured interviews or questionnaires that are limited in assessing real-time the pluriformity of societal participation. Therefore, the Whereabouts-app is developed to assess in real time individual-specific meaningful societal participation. In a 7-day period, people with MS also scored the perceived strain of their societal participation. Physiological strain (i.e. heart rate) was determined with a smartwatch, allowing examination of the real-time relationship between perceived and physiological strain of societal participation.

14.55-15.10: Dr. Erwin van Wegen – Ecological momentary assessment of daily fluctuations in fatigue and physical activities

Simultaneously sampled self-report measures such as energy level, depression and fatigue with sensor-based recording of daily activity can elucidate the complex interaction between symptoms and physical activity, by applying an intensive repeated measurement design over a prolonged period of time.

A4. Virtual, Augmented and Mixed Reality: treatment or just a gadget?

PhD Janneke Stolwijk[1,2], Drs Joost F. Baardman[1,2], Prof Corry Van der Sluis[3], Drs Els Keesom[3], Dr. Noel Keijsers[4,5], Msc Carmen J. Ensink[4]

[1]De Hoogstraat Rehabilitation, [2]Center of Excellence for Rehabilitation Medicine, University Medical Center Utrecht , [3]University of Groningen, University Medical Centre Groningen, Centre for Rehabilitation, Groningen., [4]Sint Maartenkliniek, [5]Radboud UMC department of rehabilitation

A4. Mini-symposium: Virtual, Augmented and Mixed Reality: treatment or just a gadget?, November 11, 2021, 2:10 PM - 3:10 PM

The use of Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) in rehabilitation is increasing in prevalence as it provides an opportunity for activity in an enriched environment, with resultant enhanced motivation and participation. This mini-symposium will focus on three themes: motor training, phantom limb pain (PLP) and patient education. For motor training, VR combined with motion assessment provides intensive, meaningful, task specific exercises in an enriched environment. VR based motor training applications for lower extremities, trunk and upper extremities will be presented. In the treatment of PLP, the VR/AR system creates an image of the missing limb and uses surface EMG data from the residual limb to enable the subject to control the limb and perform reaching movements. Use of this application can reduce a patient's pain. For spinal cord injury an MR patient education module, explaining what a spinal cord injury is, has been developed in co-creation with patients. Experiences of this development and results of a pilot study in 25 patients will be presented.
The learning objective is to gain knowledge on treatment options of VR/MR in motor training, treatment of PLP and patient education. Furthermore, future applications of VR/AR/MR in rehabilitation will be discussed.

7 minutes (min) Stolwijk (chair): Opening, content and objective mini-symposium
11 min Keijsers, Ensink: VR based motor training applications for lower extremities, upper extremities and trunk
3 min Questions and discussion movement
11 min Van der Sluis, Keesom: Phantom Motor Execution: treatment of phantom limb pain with augmented and virtual reality
3 min Questions and discussion pain
11 min Stolwijk, Baardman: Mixed Reality patient education module in spinal cord injury: 'the making of' and results of a pilot study
3 min Questions and discussion education
11 min Stolwijk, Keijsers: general discussion

Speakers:
Dr. J. (Janneke) M. Stolwijk-Swüste (chair) , MD, PhD, De Hoogstraat Utrecht Rehabilitation, UMCU, Utrecht
Dr. N. (Noel) Keijsers, PhD, researcher Sint Maartenskliniek Nijmegen, Radboud UMC department of rehabilitation
Msc. C. (Carmen) J. Ensink, junior researcher, Sint Maartenskliniek Nijmegen
Drs E.(Els) M. Keesom, MD resident rehabilitation medicine UMCG Groningen
Prof. Dr. C.(Corry) K. van der Sluis, MD, PhD, UMCG Groningen
Drs. J. (Joost) F. Baardman, MD, resident rehabilitation medicine De Hoogstraat Rehabilitation Utrecht

A5. Current use of Exoskeletons in Spinal Cord Injury Rehabilitation

Dr. Ilse Van Nes[1], Rosanne van Dijsseldonk[1], Dr. Edwin van Asseldonk[2], Julie Blijdenstein[3]
[1]Sint Maartenskliniek, [2]University of Twente, [3]Project March, TU Delft

A5: Mini-symposium: Current use of Exoskeletons in Spinal Cord Injury Rehabilitation, November 11, 2021, 2:10 PM - 3:10 PM

2. Learning objectives

Participants to this mini-symposium will learn:
- The state-of-the-art knowledge of the use of an exoskeleton in Spinal Cord Injury Rehabilitation
- The differences between the use of an exoskeleton for training of walking capacity in patients with incomplete spinal cord injury and compensation of walking in patients with complete spinal cord injury.
- The improvements that are necessary to be able to use the exoskeleton in daily live
- The state-of-the-art knowledge about the research that is done regarding balance control of the exoskeleton
- The experiences of a student team, building their own exoskeleton

3. Outline of the session

Program outline:

In patients with complete spinal cord injury (SCI), an exoskeleton can be used as an exercise device (to promote physical health and well-being by reducing secondary health problems) and as an assistive device (to facilitate standing and walking capacity). Moreover, the wish to use an exoskeleton as a mobility device in daily life is evident from manufacturers' claims and desired by potential users. In recent years, many exoskeletons have been developed. Despite very promising results, current available exoskeletons have limitations hampering its use. To evaluate the potential benefits of exoskeleton use, both in and outside the clinical setting, many areas need to be investigated. This workshop will give insight in the state-of-the-art knowledge and use of exoskeletons from a clinical, user, and technology perspective.

Chair: Ilse van Nes (5 minutes)
Title: Introduction

Speaker 1: Ilse van Nes (10 minutes)
Title: Improvement of quality of life after 2-month exoskeleton training in patients with chronic spinal cord injury
Short summary: Chronic complete SCI patients (n=21) followed a training program to learn how to walk with an exoskeleton. Besides the functional improvement in walking capacity, we also measured Quality of Life, satisfaction with bladder and bowel management, range of motion, pain and spasticity. The results of this study will be presented and discussed.

Speaker 2: Rosanne van Dijsseldonk (10 minutes)
Title: Needs and wishes for the future exoskeleton
Short summary: Exoskeleton use by people with complete SCI in daily life is still a challenge. To optimize its daily life use, a better understanding of the purpose of use and accompanying improvements from the perspective of exoskeleton users are needed. In this presentation, the results of an interview study among people with SCI with community-based exoskeleton experience (n=13) will be presented.

Speaker 3: Edwin van Asseldonk (10 minutes)
Title: Supporting balance of exoskeleton users

Short summary: One of the ongoing challenges in exoskeletons and an often-heard wish of their users is to assist in balance control and recovery and in doing so decrease the reliance on crutches or canes. Here we will present the recent efforts to improve balance control of exoskeleton users while standing and walking.

Speaker 4: Julie Blijdenstein (10 minutes)
Title: The experiences of a student team building their own exoskeleton
Short summary: Project MARCH is a student team allied with the Delft University of Technology that annually designs and builds an exoskeleton, for someone with a spinal cord injury so that he can stand up and walk again. Project MARCH consists of 26 driven and motivated students who put their study on hold for a whole year. The 27th most important team member is the pilot Koen, who has a spinal cord injury. Project MARCH designs the exoskeleton in co-creation together with him. In this presentation, we will talk about our team, the MARCH exoskeletons, our innovations and plans for the future.

General discussion (15 minutes)

A6. Medical Education in Rehabilitation Medicine: New frontiers and developments

Prof. dr. G.M. (Clemens) Rommers[1], dr. Willeke Kruithof[2], dr Duco Steenbeek[3], drs Jennifer Kuijlaars[4], BSc Imke Bloemen[5]

[1]MUMC+, [2]UMCU, [3]LUMC, [4]Libra Rehabilitation and Audiology, [5]FHML Maastricht University

A6: Mini-symposium: Medical Education in Rehabilitation Medicine: New frontiers and developments, November 11, 2021, 2:10 PM - 3:10 PM

Education in Rehabilitation Medicine: New frontiers and future developments

Rommers, Kruithof, Steenbeek, Kuijlaars, Bloemen.

Medical Education is a rapidly evolving field. Development of the new educational Blueprint of Medical Schools in 2020 brings focus on training the medical doctor of 2030 and beyond.
The Blueprint focuses on medical knowledge and interprofessional cooperation. The international classification of function, disability and health (ICF) forms a vital part of future medical education. This change is thus of interest to all people practicing and teaching Rehabilitation Medicine (RM). In this symposium, we inform you about the content of the new Blueprint, focus on current practice in medical schools and outline research in medical education in the Netherlands. There are challenges ahead. Is it possible to restructure medical education with ICF elements? Interprofessional cooperation: Compilation of knowledge or just carry on as it is? What is our opinion about the medical professional in 2030?

Chair: Clemens Rommers

Presenters:

00-05: Introduction: New teaching and the Blueprint: Clemens Rommers / Duco Steenbeek

05-15: The Educational Patient Contact (EPC) in Limburg: Jennifer Kuijlaars

15-30: Education in Utrecht and Leiden patient/student contacts: Willeke Kruithof

30-45: Taking stock of Medical Education in the Netherlands: an overview: Imke Bloemen / Clemens Rommers

45-60: Discussion and future developments: Willeke Kruithof / Duco Steenbeek

Outline session:
In this session, we inform the participants about the new outline of medical education's Blueprint. New academic challenges lie ahead. We share new educational concepts and discuss the value of ICF in medical school teaching. Educational research is presented about the EPC teaching in Rehabilitation Medicine including students' advice on implementing RM in the medical curriculum. A diverse array of educational developments in today's teaching are delivered to you from medical schools across the Netherlands.
In the final presentation, we inform you about the current state of medical teaching in the Netherlands. Staff and medical students views about current and future developments are presented. To conclude the session, we actively involve participants in the discussion of how to train the medical doctor of 2030 and beyond.

A7. Wearable movement sensors in neurological rehabilitation: barriers and possibilities

Dr. Marije Vos-van der Hulst[1], Prof. dr. Jaap Buurke[2,5], Msc Dirk Hoevenaars[3], Dr. Hans Bussmann[4]
[1]Sint Maartenskliniek, [2]Roessing Research & Development, [3]Vrije Universiteit Amsterdam, [4]Erasmus MC, Universitair Medisch Centrum, [5]Universiteit van Twente

A7: Mini-symposium: Wearable movement sensors in neurological rehabilitation: barriers and possibilities, November 11, 2021, 2:10 PM - 3:10 PM

Neurological injury, such as spinal cord injury (SCI) or a cerebrovascular accident (CVA) leads to motor impairment, which affects daily physical activity and mobility. Several strategies are currently available to monitor physical activity status and predict energy expenditure among individuals: ranging from self-report questionnaires to the use of consumer or research-grade wearable devices. The implementation of these wearable devices in clinical practice is of utmost importance to determine interventions aimed at promoting physical activity. However, there are several barriers to widespread implementation.
In addition to measuring the quantity of movement, motion sensors can also be used to determine the quality of movement. With regard to mobility, especially level of walking ability is important. Recent developments focus on applying motion sensors to measure walking quality in a simple and fast way to be useful for routine clinical practice.
This instructional course will evaluate the currently available measurement tools used to quantify physical activity, assess walking quality and predict energy expenditure in individuals with SCI or CVA. We will focus on the importance of measuring both quantity and quality of movement, both during in-patient rehabilitation and home-based environments after discharge from clinic. Barriers to implementation will be discussed.

Chair: Dr .Vos- van der Hulst, Marije, MD PhD; Sint Maartenskliniek Nijmegen , the Netherlands– 4 min

Hendriks, Maartje MS, Msc:Using sensor technology to measure gait during clinical rehabilitation
Department of Research, Sint Maartenskliniek Nijmegen, the Netherlands
Department of Rehabilitation, Donders Institute for Brain, Cognition and Behaviour, Radboud University Medical Center, Nijmegen, the Netherlands
- 10 min + 2 min questions

Hoevenaars, Dirk, Msc : Accuracy of heart rate measurement by Fitbit in people with spinal cord injury.
Faculty of Behavioural and Movement Sciences, Vrije Universiteit, Amsterdam, the Netherlands.
Reade Rehabilitation and Research Center, Amsterdam, the Netherlands.
-10 min + 2 min questions

Dr. Osterthun, Rutger, MD, PhD : Objective measurement and quantification of daily life physical behaviour
Rijndam Rehabilitation center, Rotterdam, the Netherlands
– 10 min + 2 min questions

Prof. dr. Buurke, Jaap: Implementation in clinical practice.
Roessingh Research And Development, University of Twente (Department of Biomedical Signals & Systems), Enschede, the Netherlands.
15 min + 5 min questions

A8. Geriatric rehabilitation: seizing the opportunity

Dr. Carel Meskers[1], Prof dr. dr. Andrea Maier[2,3], Dr Esmee Reijnierse[1,2], Drs. Kira Scheerman[1], Drs. Laure Verstraeten[3]

[1]Amsterdam UMC, [2]Royal Melbourne Hospital, [3]VU University

A8: Mini-symposium: Geriatric rehabilitation: seizing the opportunity, November 11, 2021, 2:10 PM - 3:10 PM

Every year, 10% of the population aged 65 years and older are admitted to the hospital due to acute onset or exacerbation of a variety of diseases. Hospitalization is a major contributor to loss of muscle mass and strength, functional impairment and disability in older adults: 68% of patients are discharged from post-acute care settings below their pre-hospitalization level of function, more than half do not recover to their pre-admission function one year after discharge and more than one-third are discharged with a major disability that was not present before admission. These findings highlight the urgent need for effective interventions to both restore and maintain function and optimize self-dependency acutely and long-term post-discharge in this high-risk group of patients.

Geriatric rehabilitation may offer a major window of opportunity for regaining function and activity after hospitalization. In this mini-symposium, the latest results and insights from two large observational cohort- and intervention studies in hospitalized older- and geriatric rehabilitation inpatients will be presented: the Australian RESORT study (n > 2000) and the Dutch EMPOWER studies (n > 1000). These will be translated to a number of practical guidelines into how to seize the opportunities that (inpatient) geriatric rehabilitation offers to optimize function and level of activity post-discharge in older patients.

Learning objectives 1) participants are familiar with the major characteristics of resilience of hospitalized older patients; 2) the participants are familiar with the latest insight in interventions to optimize outcome after hospitalization for older patients.

Chairs:
Prof dr. dr. Andrea Maier, internist-geriatrician, professor of ageing, VU University, Amsterdam, The Netherlands
Dr. Carel Meskers, rehabilitation physician, associate professor, Amsterdam UMC, Amsterdam, The Netherlands

Outline of the symposium:
1. The perspective: introducing the RESORT and EMPOWER studies (Andrea Maier MD PhD).
2. From hospital to geriatric rehabilitation: how to organize in-hospital care (Kira Scheerman, PhD, Amsterdam UMC).
3. RESORT study: seizing the opportunity: focus on muscle and malnutrition (Esmee Reijnierse, PhD, postdoctoral research fellow, Amsterdam UMC)
4. EMPOWER-GR study: creating awareness and feasibility of embedded interventions (Laure Verstraeten, PhD student, VU University).
5. Implications for geriatric rehabilitation (Carel Meskers, MD PhD).
6. Closing remarks/discussion

Parallel sessie B

Parallel sessie B:

B1. PhD thesis sessie

Voorzitter: prof.dr. Annemieke Buizer MD
Tijdens het Online DCRM 2021 wordt de PhD thesis Award uitgereikt op het gebied van de revalidatiegeneeskunde voor het academisch jaar 2020-2021. Na afloop van de presentaties zal de jury de winnaar selecteren voor de PhD Award Rehabilitation Medicine 2021.
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.

De drie genomineerden zijn:

- **Marleen Sol** - proefschrift '*Wheelchair Mobility Skills in youth using a manual wheelchair. From Test to Training*'
- **Rick van der Vliet** - proefschrift - proefschrift '*Non-invasive Neuromodulation in Motor Rehabilitation after Stroke*'
- **Judith Vloothuis** - proefschrift '*Caregiver-mediated exercises after stroke*

Marleen Sol

Samenvatting van het proefschrift 'Wheelchair Mobility Skills in youth using a manual wheelchair. From Test to Training'

Voor alle kinderen en jongeren is het belangrijk om fysiek actief te zijn. Dit geldt voor kinderen met en zonder beperking. Helaas weten wij dat kinderen met een beperking minder fysiek actief zijn dan kinderen zonder beperking. En van de groep kinderen met een beperking, zijn kinderen in een rolstoel vaak nog het minst actief. Ook al is een belangrijk doel binnen de kinderrevalidatie om de participatie in fysieke activiteiten bij kinderen met een beperking te optimaliseren, is er nog weinig aandacht voor het aanleren van rolstoelvaardigheden die je in het dagelijks leven nodig hebt. Te denken valt aan de rolstoel manoeuvreren, een stoep op/af rijden of balanceren op je achterwielen.
Dit proefschrift heeft zich daarom gefocust op: 1) ontwikkeling van een meetinstrument voor het meten van rolstoelvaardigheid; 2) valideren van een vragenlijst over het zelfvertrouwen in gebruik van een rolstoel; 3) valideren van een activiteiten monitoren voor rolstoel rijden; 4) evalueren van de effecten van fitheid en rolstoelvaardigheidstraining.

Eén van de belangrijkste uitkomsten van deze thesis, waren de significante positieve lange termijn effecten na een gecombineerde rolstoelvaardigheid en fitheidtraining op het verbeteren van de fysieke activiteit, fitheid, rolstoelvaardigheid en het zelfvertrouwen bij 48 kinderen en jongeren in een rolstoel.

Rick van der Vliet

Samenvatting van het proefschrift 'Non-invasive Neuromodulation in Motor Rehabilitation after Stroke'

Veel mensen krijgen een herseninfarct en verliezen daardoor hun sterk ontwikkelde arm- en handvaardigheid. In de acute fase is het belangrijk snel de verstopping weg te nemen om hersenweefsel te redden. In de maanden daarna draait het om intensief bewegen en ondersteuning van het natuurlijk herstel. In dit proefschrift hebben we een methode ontwikkeld waarmee individuele verschillen in het aanpassingsvermogen van bewegingen nauwkeurig gemeten kunnen worden. Met hersenfilmpjes vonden we signalen die het bestaan van deze verschillen ondersteunen. Dit leermodel helpt behandelingen na een herseninfarct in kaart te brengen. Verder hebben we een gedetailleerdere beschrijving ontwikkeld van het natuurlijk herstel na een herseninfarct. Dit herstelmodel hebben we gebruikt als achtergrondpatroon in een statisch model dat de impact van een behandeling na een beroerte schat. Ten slotte hebben we de kennis uit het eerste gedeelte gebruik om effecten van hersenstimulatie met een kleine gelijkstroom op het leren van bewegingen en het herstel na een beroerte te onderzoeken. Door eerder onderzoek hadden we verwacht dat mensen door deze hersenstimulatie sneller zouden leren en herstellen, maar onze resultaten waren overwegend negatief. Mogelijk is deze specifieke vorm van hersenstimulatie minder effectief dan gedacht en is het beter om alternatieve technieken te onderzoeken.

Judith Vloothuis

Samenvatting van het proefschrift ‘Caregiver-mediated exercises after stroke’

Mensen met een beroerte herstellen beter als ze intensief oefenen, maar door toename van het aantal patiënten en beperkingen in hoeveelheid en tijd van personeel kan dit niet altijd geboden worden. Om behandelintensiteit toch te borgen is onderzocht of de inzet van naasten bij het oefenen veilig kan worden uitgevoerd en van invloed is op het functionele herstel van de patiënt en kwaliteit van leven van de naaste.

Het doel van dit proefschrift was om ‘caregiver-mediated exercises’ (oefenen met een naaste) na een beroerte te onderzoeken. Als start is een overzicht gemaakt van het wetenschappelijk bewijs met betrekking tot effectiviteit van ‘caregiver-mediated exercise’-interventies die in het verleden zijn uitgevoerd met behulp van systematisch literatuuronderzoek. Vervolgens is het CARE4STROKE programma, een ‘caregiver-mediated exercise’ interventie ondersteund door e-health, ontwikkeld en beschreven in een toetsbaar en repliceerbaar behandelprotocol. Daarna is het effect van dit programma onderzocht in een gecontroleerd multicenter kosten-effectiviteitsonderzoek op de primaire uitkomstmaten zelf gerapporteerde mobiliteit en duur van opname. Tot slot zijn patiënten en naasten geïnterviewd over hun ervaringen met deelname aan het CARE4STROKE programma. Het onderzoek is uitgevoerd door Reade, centrum voor revalidatie en reumatologie, en de afdeling Revalidatiegeneeskunde van het Amsterdam UMC, locatie VUMC.

B2. Free paper sessie 1: top 4 presentaties

O1. Reliability of posturography during stroke rehabilitation - Natasja Wouda
O2. HEMIRehApp: An engaging, multisensory, immersive rehabilitation app for hemispatial neglect - Hanne Huygelier
O3. Cardiorespiratory strain of daily activities post-stroke - Ilse Blokland
O4. Validity and feasibility of unsupervised home-based vital capacity testing in patients with MND - Jochem Helleman

B3. Free paper sessie 2: Brain injury / stroke

O5. The design choices for the development of an Augmented Reality game for people with visuospatial neglect - Judy Bakker
O6. Added value of using fine-wire during instrumented gait analysis in a research setting: implications for clinical gait analysis - Eline van Staveren
O7. New ICF Core Sets for adults with cerebral palsy: Opportunities to standardize assessments worldwide - Marij Roebroeck
O8. Feasibility of the Hacker tool (Dutch version), a bedside screening tool for post stroke spasticity in nursing homes - Henk Arwert

B4. Free paper sessie 3: Neuralgic amyotrophy & spinal cord and periperal nerve injury

O9. Visuomotor processing is altered after peripheral nerve damage in neuralgic amyotrophy - Renee Lustenhouwer
O10. Reachable workspace analysis of the upper extremity in neuralgic amyotrophy - Jos Ijspeert
O11.Spinal cord injuries and bowel stomas: timing and satisfaction with stoma formation and alterations in quality of life - Janneke Stolwijk
O12.Sexual satisfaction in wheelchair-dependent individuals with long-standing spinal cord injury in the Netherlands - Gracielle Williams

B5. Free paper sessie 4: Brain injury/ stroke & neurodegenerative diseases

O13. Congruent movement training as a rehabilitation method to ameliorate symptoms of neglect - Teuni ten Brink
O14. Effect of ankle-foot orthoses on Gastrocnemius muscle electromyography after stroke: results from a randomized controlled trial - Corien Nikamp
O15. Validity and reliability of the EMG threshold during incremental cycling in neuromuscular disorders - Nicole Voet
O16. Family adjustment to amyotrophic lateral sclerosis: Transformations, struggles and needs - Marion Sommers-Spijkerman

B6. Amputation & Applicable to mutiple diagnoses

O17. Zuurstofconsumptie bij personen met een transfemorale amputatie; botverankerde- versus kokerprothese - Lisanne Haket
O18. Accelerometry entropy is associated with functional decline - E.R.M. Heemskerk
O19. A novel Self-Regulation Assessment (SeRA) for a rehabilitation population - Tanja Ingeborg Mol
O20. One chance to make a first impression? Assessing the patients' medication self-management capacity in clinical practice - Margot van den Blink

O01

Reliability of posturography during stroke rehabilitation

Drs. N.C. Wouda[1], Drs. R. Felius[2], Dr. M.F. Pisters[3], Prof. dr. J.M.A. Visser-Meily[1,3], Dr. M. Punt[2]
[1]Center of Excellence for Rehabilitation Medicine, UMC Utrecht Brain Center, University Medical Center Utrecht, Utrecht University And De Hoogstraat Rehabilitation, [2]Research group Lifestyle and Health, University of Applied Sciences Utrecht, [3]Department of Rehabilitation, Physical Therapy Science & Sports, UMC Utrecht Brain Center, University Medical Center Utrecht

B2. Free paper sessie 1: top 4 presentaties, November 11, 2021, 4:50 PM - 5:50 PM

Introduction
This study is part of the "Making sense of sensor data for personalized health care" consortium.
Balance is often affected after stroke, impacting activities of daily life. An inertial measurement unit (IMU) instrumented balance assessment helps to objectively measure balance and additionally, monitor individual progression during rehabilitation.

Objective
We examined the test-retest reliability of postural sway using a single IMU in sub-acute stroke survivors in clinical rehabilitation.

Patients
40 Sub-acute stroke patients (52.5% male, mean age of 69.0 ± 12.0) participated in the study.

Methods
The assessment consisted of five balance conditions: sitting (SIT), standing eyes open (EO), Romberg (FT), standing eyes closed (EC) and standing on foam (FO). These were performed twice with a test-retest interval of 24 hours. In total 35 sway features were calculated from each condition, reliability (ICC) and the minimal detectable change as a percentage of the standard deviation of the average observed value, were determined.

Results
A total of 22 (SIT), 30 (EO), 25 (FT), 28 (EC) and 23 (FO) sway features showed good-excellent reliability (ICC 0.75 - 1), respectively.

Discussion and conclusions
Sitting and standing balance can reliably be assessed in sub-acute stroke using a single IMU in clinical rehabilitation centres.

Clinical message
Considering the relatively low minimal detectable change scores, IMU posturography is a candidate to feasibly monitor physical progression during clinical rehabilitation. Further research will focus on the responsiveness and the predictive value of the IMU during stroke rehabilitation on the level of ADL independency at discharge and fall risk.

O02

HEMIRehApp: An engaging, multisensory, immersive rehabilitation app for hemispatial neglect

Dr. Hanne Huygelier[1], MSc Brenda Schraepen[1], Prof. Dr. Christophe Lafosse[2], Prof. Dr. Nathalie Vaes[2], Dr. Fabienne Schillebeeckx[3], Dr. Karla Michiels[3], MSc. Eline Note[3], Prof. dr. Vero Vanden Abeele[4], Prof. dr. Raymond van Ee[5]

[1]Brain and Cognition, KU Leuven, [2]Scientific Unit Rehabilitation Hospital RevArte, [3]Rehabilitation centre Pellenberg, University Hospital Leuven, [4]HCI/eMedia, Department of Computer Sciences, KU Leuven, [5]Donders Institute for Brain, Cognition and Behavior, Radboud University

B2. Free paper sessie 1: top 4 presentaties, November 11, 2021, 4:50 PM - 5:50 PM

Introduction. Hemispatial neglect is a disabling post-stroke condition for which there is currently no effective rehabilitation protocol. Although multisensory stimulation and sustained attention training have been shown to reduce the spatial attention bias in hemispatial neglect, previous treatments focused on a single intervention principle, were not patient-tailored, and were not motivating.
Objective. To improve the rehabilitation of hemispatial neglect, we integrated 7 intervention principles in an engaging, multisensory, immersive virtual reality game: HEMIRehApp.
Patients. We acquired feasibility data in 7 stroke patients.
Methods. Patients either played a short demo version of the game or played the game for multiple sessions. Cybersickness was measured with a self-report questionnaire before and after VR exposure. Feasibility to use HEMIRehApp was measured through self-report questionnaires that were administered in a semi-structured interview and through observations. In-game data was compared to neglect measured on non-VR assessment.
Results. First, we observed less cybersickness after than before the immersive VR exposure in all patients. Second, patients were motivated to play HEMIRehApp. Third, although we observed usability issues in initial test phases, we solved these issues iteratively. Game data revealed that neglect on non-VR assessment corresponded to neglect in the VR game.
Discussion and conclusions. In sum, our data show that the use of immersive virtual reality in stroke rehabilitation is promising. A pre-registered clinical trial to further evaluate the feasibility and efficacy of HEMIRehApp is ongoing.
Clinical message. Immersive virtual reality is safe and feasible to use for rehabilitation of stroke patients.

O03

Cardiorespiratory strain of daily activities post-stroke

Ilse J. Blokland[1,2], Linda F.A. Schiphorst[1,2], Jessie R. Stroek[1,2], Floor P. Groot[3], Prof. Dr. Coen A.M. van Bennekom[2,4], Prof. Dr. Jaap van Dieen[1], Dr. Jos J. de Koning[1], Prof. Dr. Han Houdijk[5]
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B2. Free paper sessie 1: top 4 presentaties, November 11, 2021, 4:50 PM - 5:50 PM

Introduction
Individuals post-stroke are less active, experience more fatigue and perform activities slower than able-bodied peers. Aside from apparent neurological reasons, these problems might be caused by a mismatch between energy expenditure of daily tasks and cardiorespiratory fitness post-stroke.

Objective
To quantify cardiorespiratory strain of daily-life activities post-stroke in terms of relative aerobic load (i.e. the ratio between aerobic energy expenditure and cardiorespiratory fitness).

Patients
Seventy-nine individuals post-stroke (14 Functional Ambulation Category (FAC) 3, 25 FAC-4 and 40 FAC-5) and twenty-two age, gender and BMI-matched peers.

Methods
Participants performed five daily activities at preferred pace to determine aerobic energy expenditure ($ml O_2$/kg/min) and economy ($ml O_2$/kg/unit distance). Cardiorespiratory fitness parameters were derived from a maximal exercise test. Relative aerobic load was defined as energy expenditure divided by peak oxygen uptake (%VO_2peak) and by oxygen uptake at ventilatory threshold (%VO_2-VT).

Results
Individuals post-stroke performed activities at a significantly higher relative aerobic load (39-82 %VO_2peak, 86-148 %VO_2-VT) than able-bodied peers (38-66 %VO_2peak, 70-129 %VO_2-VT), despite moving significantly slower. They also moved less economically than able-bodied peers during all activities.

Discussion
Individuals post-stroke experience a high cardiorespiratory strain during daily life activities despite moving slower than able-bodied peers. A higher movement pace would likely improve economy but result in unsustainable cardiorespiratory strain. Potentially, reducing movement speed is used as a strategy to function at sustainable cardiorespiratory strain levels. Training cardiorespiratory fitness could lower cardiorespiratory strain and thereby reduce fatigue and/or increase comfortable movement pace.

Clinical message
Consider training cardiorespiratory fitness to improve functioning after stroke.

O04

Validity and feasibility of unsupervised home-based vital capacity testing in patients with MND

Drs. Jochem Helleman[1,2], Drs. Jaap Bakers[1,2], Prof. Dr. Leonard van den Berg[3], Prof. Dr. Anne Visser-Meily[1,2], Dr. Anita Beelen[1,2]

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B2. Free paper sessie 1: top 4 presentaties, November 11, 2021, 4:50 PM - 5:50 PM

Introduction. Remote monitoring of respiratory function is important in patients with motor neuron disease (MND), especially in individuals who are not able to visit a multidisciplinary clinic. However, its use in MND care is lacking, due to the limited data on validity and feasibility of home-based testing.
Objective. To assess the validity and feasibility of unsupervised home-based vital capacity (VC) testing in patients with MND.
Patients: 33 patients with MND who had access to a smartphone.
Methods. Patients completed 4-weekly home assessments of the unsupervised VC test, ALSFRS-R and MND Dyspnea scale, for 12 weeks. At baseline and final follow-up a supervised VC test was performed by the investigator during a home visit. Validity, sensitivity and feasibility of unsupervised home-based VC testing were assessed.
Results. The unsupervised VC was not significantly different from the supervised VC (mean difference=0.52, 95% CI [-1.29; 2.32], p=0.567), and showed high sensitivity (97.1%) for predicting supervised VC<80%. Adherence to the home-based VC testing was 100%, and most patients did not perceive unsupervised VC testing as burdensome (84%), were confident in their ability to perform a VC test (75%) and would like home monitoring of VC in MND care (91%).
Conclusion. Home-based VC testing, with prior training and notifications during follow-up, is a valid method for remote monitoring of respiratory function, and well-received by patients with MND in our cohort.
Clinical message. Home monitoring of VC could be implemented in MND care to improve the monitoring of respiratory function.

O05

The design choices for the development of an Augmented Reality game for people with visuospatial neglect

PhD Judy Bakker[1], Dr. M.S. Holstege[1], Dr. N. Boonstra[2], Ass. Prof. Dr. T. C.W. Nijboer[3,4,5], Prof. Dr. W.P. Achterberg[6], Prof. Dr. N.H. Chavannes[6]

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B3. Free paper sessie 2, November 11, 2021, 4:50 PM - 5:50 PM

Introduction
Visuospatial neglect (VSN) is common after stroke and can hamper everyday life. The most commonly used rehabilitation methods is Visual Scanning Training (VST) which requires a lot of repetition that could make the treatment intensive and less appealing for the patient. One solution to motivational issues might be Augmented Reality (AR) which offers new opportunities for increasing natural interactions with the environment during treatment of VSN.

Objective
The development of an AR-based scanning training program that will improve visuospatial search strategies in individuals affected by VSN.

Patients
Seven patients with VSN, eight occupational therapists, a game design professional and seven other healthcare professionals participated in this co-creation.
Method
Design Research (DR) approach, which is characterized by the iterative and incremental use of prototypes together with a strong human-centered focus. Several design thinking methods were used to explore which design elements the AR game should comply with.

Results
Fundamental design choices for an AR game for VSN patients were extrinsic motivation, nostalgia, metaphors, direct feedback, independent movement, object contrast, search elements and competition. Designing for extrinsic motivation was considered the most important design choice, because due to less self-awareness of the target group.

Discussions/Conclusions
This study produced a prototype AR game for people with VSN after stroke.
Further research is focused on including gradation, competence and personalization elements in de AR game through DR.

Clinical message
The AR game and method used illustrate the promising role of AR tools aimed at increasing the independence of patients with VSN after stroke.

O06

Added value of using fine-wire during instrumented gait analysis in a research setting: implications for clinical gait analysis

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B3. Free paper sessie 2, November 11, 2021, 4:50 PM - 5:50 PM

Introduction: Surface electromyography (sEMG) has become common in clinical gait analysis. However, it can only be used for superficial muscles and is susceptible to pick up electrical activity of adjacent muscles. Directly inserting the EMG electrodes into the muscles (fine-wire EMG) under ultrasound guidance is a way to study muscles that lie deeper and with less interference of other muscles.
Objective: Share experiences with fine-wire EMG in the research setting and state implications for clinical gait analysis.
Patients: Unilateral hemiparetic subjects and transfemoral amputees.
Methods: Fine-wire EMG was collected from the tibial posterior muscle in stroke survivors and from the semitendinosus, biceps femoris and vastus lateralis muscles in transfemoral amputees.
Results: Electrode placement under ultrasound guidance was well tolerated by all individuals. Pressing the skin when retracting the needle helps the fine-wire tips to hook into the muscle. A loop was applied before wire fixation to the skin, to prevent traction artefacts. It was necessary to check signal quality, because the wire-receiver connection can be disturbed and fine-wire tips can deviate from the targeted muscle.
Discussion/conclusions: Using fine-wire EMG allowed us to study the muscle activation pattern of the posterior tibial muscle of stroke survivors and muscles of individuals with a transfemoral amputation despite changed muscle geometry. However, it requires specific expertise on electrode placement and checking signal quality.

Clinical message: There is a place for fine-wire EMG in clinical gait analysis, especially when there is a need to study activation pattern of muscles that lie deep within the extremities.

O07

New ICF Core Sets for adults with cerebral palsy: Opportunities to standardize assessments worldwide

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Introduction: Nowadays 75% of persons with Cerebral Palsy (CP) is at adult age. A lack of standardization of outcomes on their functioning hampers international collaboration.
Objective: To reach worldwide consensus on ICF Core Sets for adults with CP, complementing the Sets for children and youth with CP.
Patients: adults with CP
Methods: An online international consensus study with 25 experts of several professional backgrounds and persons with CP. An iterative consensus process started with 154 ICF candidate categories, gathered in a systematic literature review, an expert survey, a qualitative and a clinical empirical study. In two rounds experts consented on the categories of the Comprehensive ICF Core Set for adults with CP; in two other rounds on the most important categories (Brief ICF Core Set).
Results: The Comprehensive ICF Core Set for adults with CP addressed 33 body functions, 8 body structures, 50 activities and participation, and 29 environmental factors. The Brief set included 33 categories, while still capturing the most essential categories of functioning mental and physical functions, eight out of nine areas of activities and participation, and several environmental factors.
Discussion and conclusion: We pioneered an online version of the established ICF-CS consensus process. The large number and broad range of categories consented on underlines the diversity of problems in functioning of adults with CP.
Clinical message: ICF Core Sets for adults with CP gives us opportunities to improve clinical care and international research.

O08

Feasibility of the Hacker tool (Dutch version), a bedside screening tool for post stroke spasticity in nursing homes.

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B3. Free paper sessie 2, November 11, 2021, 4:50 PM - 5:50 PM

Introduction
In nursing homes, post stroke spasticity (PSS) is not always recognised and often remains untreated. Screening on spasticity may help in identifying patients at risk.
Objective
To evaluate the feasibility of a bedside screening tool in nursing homes.
Patients
Patients in nursing homes, regardless of diagnosis or department (long stay or rehabilitation).
Methods
The Hacker screening tool is an algorithm to assess spasticity by untrained care personnel. It consists of 3 questions regarding weakness, abnormal posture and resistance in movement; the procedure takes less than 2 minutes. The outcome is: refer to a spasticity specialist Yes / No. It was translated to Dutch, aided by a professional translator.
The screening tool was evaluated in 2 nursing homes. The feedback was collected systematically.
Results
Four employees evaluated the screening tool in 18 consecutive patients. Mean age of the patients was 78.4 years (SD 11.4); primary diagnosis category: neurology 7, traumatology 7, internal medicine 4. Six patients received physical therapy, 5 were treated with splints, 3 used spasmolytic medication. Seven patients should be referred to a spasticity specialist .
The employees judged it as easy to use, the questions to be answered were clear. No questions were missed. Tiredness of the patient may influence the assessment.
Discussion and conclusions
The screening tool for PSS in nursing homes is easy to use for untrained personnel in daily practise.
Clinical message
The Hacker Tool (Dutch version) is feasible for PSS bedside screening. Subsequently, assessment of its validity and reliability is recommended.

O09

Visuomotor processing is altered after peripheral nerve damage in neuralgic amyotrophy

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Introduction
Neuralgic amyotrophy is a common peripheral nerve disorder caused by auto-immune inflammation of the brachial plexus, clinically characterized by acute pain and weakness of shoulder muscles, followed by motor impairment. Despite recovery of peripheral nerves, patients often have residual motor dysfunction and subsequent persistent pain of the upper extremity. Neuralgic amyotrophy patients often develop alternative motor strategies, which suggests that (mal)adaptations may occur in somatomotor and/or visuomotor brain areas.
Objective
Here we show and characterize central alterations following neuralgic amyotrophy and tested where changes in central sensorimotor representations occur in neuralgic amyotrophy.
Patients
39 neuralgic amyotrophy patients with persistent, lateralized symptoms in the right upper extremity and 23 matched healthy participants.
Methods
During functional MRI scanning, participants solved a hand laterality judgment task known to rely on sensorimotor representations of the own upper extremity.
Results
Compared to healthy participants, neuralgic amyotrophy patients had slower imagery performance, and decreased imagery-related activity for their affected limb in two higher-order visual brain regions: the right extrastriate cortex and the parieto-occipital sulcus. Across patients, extrastriate imagery-related activity decreased as persistent pain increased, and parieto-occipital imagery-related activity decreased as imagery performance of the affected limb slowed.
Discussion and conclusions
The findings provide evidence that residual motor dysfunction and subsequent persistent pain in neuralgic amyotrophy are linked to maladaptive cerebral plasticity in visuomotor areas involved in sensorimotor integration.
Clinical message
Rehabilitation interventions that apply visuomotor strategies to improve sensorimotor integration may help to treat neuralgic amyotrophy patients.

O10

Reachable workspace analysis of the upper extremity in neuralgic amyotrophy.

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Introduction: Neuralgic amyotrophy is a common multifocal neuropathy which often damages nerves of the upper extremity, which limits patients in using their affected arm, especially in elevated range of motion. The reachable workspace (RWS) is a computerized 3D analysis system that evaluates the reachable surface area (RSA), from 0 no- to 1 full range of motion, in which the upper extremity can be used and has shown usability in multiple neuromuscular disorders.
Objective: We examined the usefulness of RWS measurements in patients with neuralgic amyotrophy compared to healthy controls, and correlated with upper extremity function questionnaires and hand held dynamometry of the arm.
Methods: 47 patients with neuralgic amyotrophy and 25 healthy age- and sex matched controls were measured with the RWS. Patient RSAs were correlated to the shoulder rating questionnaire (SRQ), the disabilities of arm shoulder and hand (DASH) questionnaire and multiple hand held dynamometry measurements.
Results: Patients with neuralgic amyotrophy produced significantly lower overall RSAs for the affected arm, the two upper quadrants and the lower heterolateral quadrant compared to controls (P.000). We found significant correlations between RWS, DASH (r-.415 P.006) and serratus anterior muscle strength (r.414 P.006).
Discussion and conclusions
RWS detects limitations in RSA of the affected arm after neuralgic amyotrophy. Relatively moderate correlation coefficients suggest that RWS measures different aspects of disability compared to shoulder questionnaires or hand held dynamometry.
Clinical message
RWS provides an effective way to establish functional limitations of the affected upper extremity in neuralgic amyotrophy and a potential outcome measure.

O11

Spinal cord injuries and bowel stomas: timing and satisfaction with stoma formation and alterations in quality of life

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Introduction: Neurogenic bowel dysfunction (NBD) is frequent among individuals with spinal cord injury (SCI) and often difficult to treat. A bowel stoma is considered the last-resort treatment option for individuals with SCI and severe NBD.
Objective: This study aims to explore whether individuals are satisfied with their bowel stoma and how they feel about the timing of stoma formation. Furthermore, we want to explore side effects addressing diversion colitis and changes in quality of life (QOL) after stoma formation.
Patients: Individuals aged at least 18 years with a traumatic or non-traumatic SCI and bowel stoma.
Methods: A cross-sectional online survey was performed in the Netherlands. Questions regarded timing of stoma formation, alterations in QOL after stoma formation and experienced side effects of the bowel stoma. Severity of bowel symptoms was measured with a modified version of the NBD Score.
Results: 23 participants filled out the online survey. Twenty-two participants (96%) were satisfied with their bowel stoma and 83% felt their stoma was placed too late or far too late. Seven participants (30%) reported to have diversion colitis in the last three months.
Discussion and conclusions: Most participants with SCI experienced improvement in QOL and in retrospect wanted their bowel stoma earlier. Furthermore, the equivalence of our modified NBD score and the original NBD score needs to be established in new studies to evaluate NBD in individuals with SCI and bowel stoma.
Clinical message: Early, extensive conversations to inform individuals with SCI about bowel stoma as a treatment option is recommended.

O12

Sexual satisfaction in wheelchair-dependent individuals with long-standing spinal cord injury in the Netherlands.

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Introduction: sexual satisfaction in the spinal cord injury (SCI) population is often overlooked. Moreover, data on sexual satisfaction in the aging SCI population is scarce.

Objectives: to determine sexual satisfaction and its determinants in wheelchair-dependent persons with long-standing SCI.

Patients and Methods: cross-sectional study in persons with long-standing SCI in the Netherlands. Inclusion criteria: age at injury 18-35 years; time since injury (TSI) ≥10 years; current age 28-65 years; wheelchair dependency. Degree of sexual satisfaction was measured on a five-point scale and dichotomized to satisfied and dissatisfied. Data on personal characteristics, mental health and self-efficacy was obtained with a self-report questionnaire. Injury characteristics and secondary health conditions, including sexual dysfunction related to SCI, were assessed by a rehabilitation physician.

Results: in this study 197 men and 58 women were included with a mean age of 47.7[SD 8.8] and 47.7[SD 9.1] years, tetraplegia in 46.7% and 33.3%, and motor complete injury in 82.7% and 78.9%, respectively. Mean TSI was 23.4 years[SD 4.7]. Sexual satisfaction for men was 40.6% and for women 37.9%(p=0.714). Independent determinants of sexual dissatisfaction were worse mental health (p<0.001) and sexual dysfunction (p=0.025) for men and having a relationship (p=0.011) for women.

Discussion and conclusion: Less than 45% of people with long-standing SCI are sexually satisfied. Independent determinants of sexual dissatisfaction were worse mental health and sexual dysfunction in men and having a relationship in women.

Clinical message: long-term follow-up care should attend to the unmet sexual healthcare needs of this population.

O13

Congruent movement training as a rehabilitation method to ameliorate symptoms of neglect – proof of concept

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B5. Free paper sessie 4, November 11, 2021, 4:50 PM - 5:50 PM

Introduction. Visual Scanning Therapy (VST) is widely used to ameliorate symptoms of visuospatial neglect ("neglect"). Yet, not all patients benefit from VST and many sessions are needed. One potentially promising improvement to VST is based on the theory that different effectors of the motor systems (eyes/hands) independently allocate attention during the movement programming. Objective. We tested whether a congruent movement training (CMT: congruent -i.e. executed at the same time to the same location- eye and pointing movements) is more effective to attenuate symptoms of neglect than VST. Patients. Stroke patients with neglect admitted to inpatient rehabilitation. Methods. Patients were randomly assigned to CMT (N=10) or VST (N=9). Patients received ten 30-minute training sessions along their rehabilitation program. On two consecutive days before and after training, neglect was assessed using shape cancellation, line bisection, and observations in daily life (Catherine Bergego Scale). One-sampled t-tests were used to assess effects of each training on a combined neglect score. Independent samples t-tests were used to compare effects of CMT and VST. Results. Attenuation of neglect symptoms (i.e. the combined neglect score) was seen in the CMT group. In contrast, no training effects were found after VST. Discussion and conclusions. Neglect can improve after ten 30-minute sessions of CMT in the subacute phase after stroke. This study can be seen as a proof of concept. Clinical message. Results indicate the potential of CMT which is a minimal –yet crucial– upgrade of the standard VST protocol that can be easily implemented in the clinic.

O14

Effect of ankle-foot orthoses on Gastrocnemius muscle electromyography after stroke: results from a randomized controlled trial

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B5. Free paper sessie 4, November 11, 2021, 4:50 PM - 5:50 PM

Introduction:
Ankle-foot orthoses (AFOs) are used to improve walking after stroke, but some clinicians are concerned that AFO-use early post-stroke could lead to muscle disuse of the Gastrocnemius muscle (GM).
Objective:
To study whether AFO-use after stroke affects GM-activity over a period of 26 weeks.
Patients:
Unilateral hemiparetic subjects with indication for AFO-use, maximal six weeks post-stroke.
Methods:
A randomized controlled trial was performed, randomly assigning subjects to: early (study-week 1) or delayed AFO-provision (study-week 9). Smooth-rectified electromyography of the GM during single stance and the double support phases were measured in study-week 1, 9, 17 and 26. Paired samples T-test compared data with and without AFO within one measurement session. Mixed-model repeated measures analysis within both groups compared data over the 26-weeks period, including walking speed as covariate.
Results:
Twenty-six subjects were analysed. Within a single measurement session, walking with AFO significantly lowered GM-activity levels during single support (p=0.018) compared to without AFO. No changes were found during the double support phases. No changes in GM-activity in any stance-phase without AFO was found during the 26-weeks follow-up period, both for the early and the delayed group.
Discussion and conclusions:
AFO-use after stroke decreased GM-activity during single stance within a single measurement session. However, no changes in GM-activity in stance were found without AFO over time during the follow-up of 26 weeks.
Clinical message:
The results indicate that there is no need to have concerns about negative consequences of AFO use early after stroke on muscle disuse of the GM.

O15

Validity and reliability of the EMG threshold during incremental cycling in neuromuscular disorders

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B5. Free paper sessie 4, November 11, 2021, 4:50 PM - 5:50 PM

Although muscle fatigue is a common and potentially the most disabling symptom in neuromuscular disorders (NMD), no objective outcome measure is available yet. In healthy persons, surface electromyography (sEMG) thresholds (EMG-Ts) during a cardiopulmonary exercise test (CPET) are related to the first and second ventilatory thresholds (VTs). We hypothesized that in patients with NMD, the sEMG thresholds would occur relatively early in time than compared to the VT, compared to healthy subjects.

In total 24 healthy participants and 35 NMD patients performed a CPET on a bicycle during which we collected ergospirometry data (power (W) at the first ventilatory threshold (VT1) and the second ventilatory threshold (VT2)), and sEMG data of lower leg muscles (power (W) at the first sEMG threshold (EMG T1) and the second sEMG threshold (EMG T2), using the V-slope method.

Threshold determination was feasible for VT1, VT2 and EMG T2 (>80%), while feasibility of EMG T1 was low (<43%). Inter-rater reliability of EMG T1 varied between muscles (ICC between 0.169 and 0.990), while inter-rater reliability of EMG T2 was high for all muscles (ICC>0.95). Test-retest reliability was excellent in all participants for VT1, VT2 and EMG T2 (ICC >0.9). Both the VTs are able to differentiate between healthy controls and patients, where healthy controls have thresholds at a higher power ($p<0.001$).

In line with our hypothesis, the sEMG thresholds of patients occurred relatively early in time compared to controls, while for the normalized VT, only VT1 shows a significant difference between healthy controls and patients.

O16

Family adjustment to amyotrophic lateral sclerosis: Transformations, struggles and needs

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B5. Free paper sessie 4, November 11, 2021, 4:50 PM - 5:50 PM

Amyotrophic lateral sclerosis (ALS), progressive muscular atrophy (PMA) and primary lateral sclerosis (PLS), together referred to as ALS, are life-limiting diagnoses affecting not only patients but also the families surrounding them, especially when dependent children are involved. Despite previous research highlighting the vulnerability of children in these families, they are, as yet, often overlooked in healthcare. Efforts are needed to better support children in families living with ALS, both directly and through strengthening parents in their parental role. This study sought to gain a better understanding of parental and children's experiences, struggles and support needs in families living with ALS. Semi-structured interviews were conducted with 8 parents with ALS, 13 well parents and 15 children, together representing 17 families. Interview data were analyzed using qualitative content analysis. Three major themes were identified relating to (1) ALS-related transformations in families' homes, activities, roles and relationships, that trigger (2) distress among families, which, in turn, evokes (3) emotional, psychological, educational and practical support needs. For emotional and practical support, parents and children mainly rely on their own family and social network, whereas they seek educational and psychological support from healthcare professionals. Our findings imply that ALS care professionals may foster family adjustment to living with ALS, most notably through encouraging parents to engage in a dialogue with their children about the many transformations, struggles and needs imposed by ALS and teaching them how to start the dialogue.

O17

Zuurstofconsumptie bij personen met een transfemorale amputatie; botverankerde- versus kokerprothese

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B6. Free paper sessie 5, November 11, 2021, 4:50 PM - 5:50 PM

Introductie
Voor transfemoraal geamputeerden met kokerprothese (K) gerelateerde problemen kan een botverankerde prothese (BP) verbetering brengen in functioneren, kwaliteit van leven en zuurstofconsumptie. Momenteel is het onbekend of hoogactieve personen zonder koker-gerelateerde problemen ook baat kunnen hebben bij BP. Door de vaste verbinding tussen lichaam en de prothese bij BP kan gespeculeerd worden dat door verdwijnen van pistoning de compensatiestrategieën tijdens het lopen verminderen en daardoor de zuurstofconsumptie vermindert.

Doel
Het bepalen van verschillen in zuurstofconsumptie, pistoning en lichaamszwaartepunt- en rompbewegingen tussen actieve personen met een transfemorale K of BP.

Patiëntpopulatie
Hoog-actieve transfemoraal geamputeerden zonder prothese-gerelateerde klachten(K: n=10, BP: n=10) met controlegroep van gezonde personen (C: n=10).

Methode
De zuurstofconsumptie werd gemeten tijdens lopen op een loopband; op voorkeurssnelheid, 30% sneller en 30% langzamer. Pistoning en lichaamszwaartepunt- en rompbewegingen werden gemeten met reflecterende markers tijdens lopen op voorkeurssnelheid.

Resultaten
Zuurstofconsumptie en lichaamszwaartepunt- en rompverplaatsingen verschilden significant tussen K en C, echter niet tussen BP en C en BP en K. Bij beide amputatiegroepen correleerden grotere lichaamszwaartepunt- en rompbewegingen significant met een hogere zuurstofconsumptie. Bij K was meer pistoning gecorreleerd met grotere rompbewegingen.

Discussie en conclusie
Op groepsniveau verschilden de uitkomstmaten niet significant tussen BP en K, maar bij K lijkt pistoning de compensatoire rompbewegingen te vergroten, wat leidt tot een hoger zuurstofverbruik. De resultaten moeten voorzichtig worden geïnterpreteerd vanwege de kleine onderzoeksgroep en meer onderzoek is nodig naar onderliggende mechanismen.

Klinische boodschap

Met voorzichtigheid kan verondersteld worden dat K gebruikers met veel pistoning enig voordeel kunnen ondervinden van een BP.

O18

Accelerometry entropy is associated with functional decline

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B6. Free paper sessie 5, November 11, 2021, 4:50 PM - 5:50 PM

Introduction
Timely personalized treatment of functional decline depends on early ambulant identification of persons at risk. Regularity of daily body acceleration, quantified by sample entropy (SampEn), is associated with fall risk and is a potential proxy for functional (biopsychosocial) resilience.

Objective
This cross-sectional study associates SampEn of daily life accelerometry with physical (short physical performance battery, SPPB [0-12]) and cognitive functioning (cognitive impairment test, 6-CIT [0-28]).

Patients
Data was provided from the HIPCARE cohort of 51 community-dwelling adults [aged 81 (75 – 89) yrs.] after femur fracture.

Methods
The SPPB, 6-CIT, and 7 days accelerometry were recorded at three months follow-up after hip surgery. The mean SampEn for different activities was compared between patients with low (<4), moderate (4-9), and high (>9) SPPB and between low (<8) and high (>7) 6-CIT with a significance of $p \leq 0.05$.

Results
Moderate SPPB scores and high 6-CIT are associated with high regularity in daily life acceleration during different activities (e.g., stair walking versus cycling, sitting).

Discussion and conclusions
More regular accelerations indicate the development of limited physical performance and deterioration of cognitive functions.

Clinical message
Acceleration entropy in daily life activities is a promising proxy for physical and cognitive (biopsychological) function.

O19

A novel Self-Regulation Assessment (SeRA) for a rehabilitation population.

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B6. Free paper sessie 5, November 11, 2021, 4:50 PM - 5:50 PM

Objective: Self-regulation refers to self-management and self-control, with or without disability. Self-regulation is recognized as an important factor in medical rehabilitation and outcome measurement would be desirable. Prior research revealed a conceptual model of self-regulation, based on sub-domains identified by former rehabilitation patients. A subsequent systematic review of self-regulation measures revealed many measures, but no measure was identified which fitted this model. Therefore, we aimed to construct a novel Patient-Reported-Outcome-Measure of self-regulation.

Methods: Items were collected, generated and revised based on the previously developed model. These items were discussed with experts from the field, and cognitive interviews with former patients were conducted. A list of 22 items was distributed in a cross-sectional online survey. Exploratory factor analyses and internal consistency analysis were used to define scales and select items.

Results: A total of 563 former rehabilitation patients completed the survey. The mean age of the respondents was 56.5 years, the largest diagnostic groups were Spinal Cord Injury and Acquired Brain Injury, and the majority of the respondents followed a rehabilitation trajectory 4 to 2 years ago. Exploratory factor analyses resulted in a four-factor solution. The factors were labelled as ‘insight in condition’, ‘insight in abilities’, ‘apply self-regulation’ and ‘organization of help’. Item reduction was conducted based on item-total-correlations and item content. This resulted in a 12-item patient-reported-outcome-measure. Cronbach’s Alpha was .89. Cronbach’s Alpha for the subscales were respectively .83, .76, .79, and .85.

Conclusion: A novel self-regulation assessment was developed. This Patient-Reported-Outcome-Measure holds a four factor solution including 12-items.

O20

One chance to make a first impression? Assessing the patients' medication self-management capacity in clinical practice

Bachelor of Nursing Margot van den Blink[1], Bachelor of Nursing Femke Nabbe[1], Dr. Annette van Kuijk[1]
[1]*Tolbrug / Jeroen Bosch Ziekenhuis*

B6. Free paper sessie 5, November 11, 2021, 4:50 PM - 5:50 PM

Introduction: Medication self-management is an essential part of clinical rehabilitation. Facilitating medication self-management next to all other rehabilitation goals is challenging. During this intensive learning process, nurses are continuously searching for the best way to facilitate patients. However, we do not yet fully understand their decision-making process. Exploring this process can provide new insights enhancing medication self-management support.
Aim: To explore how nurses currently assess patients concerning their capacity to manage medication, and how they tailor medication self-management support.
Patients & Methods: Based on a framework from a brief literature review, we qualitatively explored how medication self-management support is applied in clinical practice. From February to April 2021, data was collected through an online survey among clinical rehabilitation wards in the Netherlands and geriatric rehabilitation wards in 's-Hertogenbosch.
Results: 8/18 rehabilitation and 3/5 geriatric wards participated. All wards considered empowering patients to take care of their medication as a crucial step for discharge. They all monitored medication administering and adherence within their electronic patient records. Medication self-management support was primarily aimed at accurate medication taking. Only 1 geriatric ward considered administering mediation as part of the training as well. Although the nurses' perception of patient's self-management capacities was the key driver for tailoring medication self-management support, assessing the patients' self-management capacity substantially differed between wards and individual nurses.
Discussion: To enable responding to the unique wishes and needs of individual patients, both scientific and educational efforts need to be directed towards a systematic assessment of patients' capacity to manage medication.

Parallel sessie C

C1. The value of PROMIS (Patient-Reported Outcomes Measurement Information System) in stroke populations; recommendations and limitations.

Dr. Henk Arwert[1], prof. dr. Caroline Terwee[2], Dr. Paulien Goossens[3], PhD Diana Oosterveer[1], drs Joris de Graaf[4]
[1]Basalt Revalidatie, [2]Amsterdam UMC, Epidemiology and Data Science, [3]Merem Revalidatie, [4]UMC Utrecht, afd revalidatiegeneeskunde

C1. Workshop: The value of PROMIS (Patient-Reported Outcomes Measurement Information System) in stroke populations; recommendations and limitations, November 12, 2021, 9:05 AM - 10:05 AM

session description:
Learning objectives:
Health outcome measurement can serve several goals, it can stimulate the improvement of care in specific populations, can contribute to clinical decision making in individual patients or can serve as a benchmark. In this workshop the most recent insights will be shared regarding the choices to made in measuring health outcomes after stroke in order to close the circle of value based health care. In this respect, PROMIS is gaining ground as a tool in health outcome measurement since its introduction in 2007.
Participants will be able to understand the choices to be made in the implementation of PROMs in stroke populations, and can value the outcomes.

Chair / presenters:
P.H. Goossens (RvB Merem en revalidatiearts; lid van wetenschappelijke raad van Stichting Revalidatie Impact): The do's and don'ts in value based health care, an introduction.
C.B. Terwee (Associate Professor, Epidemiology and Data Science, Amsterdam UMC): The value of PROMIS item banks in value based health care, general perspectives and pitfalls.

H.J. Arwert (revalidatiearts Basalt Revalidatie): The use of PROMIS in stroke populations, an overview.
J.A. de Graaf (revalidatiearts UMC Utrecht & PhD student Kenniscentrum Revalidatiegeneeskunde Utrecht): Towards value-based stroke care: a comparison among commonly used Patient-Reported Outcome Measures (PROMs) to evaluate stroke outcomes.
D.M. Oosterveer (revalidatiearts Basalt Revalidatie): Measurement properties of PROMIS item banks in stroke.
Chairperson: P.H. Goossens

Outline session:
Patient reported outcome measures (PROMs) are essential in evaluating the outcomes of health care. However, current PROMs are limited by a lack of precision, standardization, and comparability of scores across studies and diseases. The challenge is to select a questionnaire that firstly fits the research question optimally, and secondly has adequate psychometric properties in the field of interest.
In 2007 the Patient-Reported Outcomes Measurement Information System (PROMIS) became available. PROMIS measures are questionnaires that cover generic as well as specific domains. All PROMIS measures use the same metric and are standardized to the US population. The use of a normalized distribution (scale T-score with a mean of 50, and SD of 10 in a general population) enhances interpretability. PROMIS measures have been applied in numerous patient groups such as spinal surgery, critical illness, low back pain, anxiety in young cancer patients, chronic pain and general rehabilitation populations.
The International Consortium for Health Outcomes Measurement (www.ICHOM.com) promotes the use of PROMIS-GH (Global Health) as a part of routine outcome measurement for stroke patients (follow up to 3 months). The PROMIS-GH consists of 10 items and leads to two generic component scores measuring symptoms and quality of life: global physical health and global mental health.

C2. De techniek staat voor niets: technologische ontwikkelingen in de zorg voor patienten met een spierziekte.

Dr. Nicole Voet[1,2], Dr. Mariska Janssen[1,2], Dr. Nens van Alfen[3], Dr. Jonne Doorduin[3], Ties Klok[1], Marjolein Paus[1]
[1]Revalidatiecentrum Klimmendaal, [2]Radboudumc, afdeling Revalidatie, [3]Radboudumc, afdeling Neurologie

C2. Workshop: De techniek staat voor niets: technologische ontwikkelingen in de zorg voor patienten met een spierziekte, November 12, 2021, 9:05 AM - 10:05 AM

Binnen de neurologie in Nederland wordt echografie voor een toenemend aantal indicaties toegepast. Zo toonde recent onderzoek dat echografie beter in staat is een diafragmaparese aan te tonen dan röntgenfoto's of een EMG, bovendien kan dit onderzoek ook dynamisch worden ingezet.
Diafragmadisfunctie blijkt meer voor te komen bij spierziekten dan aanvankelijk werd gedacht en kan voor een fors verminderd functioneren zorgen. In de richtlijn ' carpaletunnelsyndroom ' wordt echografie zelfs als eerste voorkeur genoemd boven EMG op basis van patientvriendelijkheid.

Voor mensen met een spierziekte is de wereld door Corona nog kleiner geworden. Gamen wordt daardoor een nog belangrijker tijdverdrijf. Maar de normale besturingssystemen van spelcomputers zijn niet altijd geschikt. Het aangepast gamen heeft in het afgelopen coronajaar een vlucht genomen in Nederland.

In Nederland zijn technische universiteiten samen met revalidatie-afdelingen toenemend actief in het ontwikkelen van exoskeletten voor armen, benen en/of romp.
Uiteindelijk is het idee om alle componenten te integreren tot een full body exoskelet dat licht en comfortabel draagbaar is, de spierfunctie ondersteunt en daarmee de functionaliteit behoudt. De dag dat revalidatieartsen naast een enkel-voet-orthese een exoskelet, een aangepaste gamecontroller of een echo van het diafragma gaan voorschrijven, komt steeds dichterbij: wees voorbereid!

Dit programma is samengesteld vanuit de VRA NMA werkgroep, onder voorzitterschap van dr. Nicole Voet, revalidatiearts Klimmendaal/ Radboudumc:

1. Drs. Ties Klok, kinderfysiotherapeut Klimmendaal:
de (on)mogelijkheden van aangepast gamen voor kinderen en volwassenen met een spierziekte. (10 minuten)
2. Dr. Nens van Alfen, neuroloog en Dr. Jonne Doorduin, technisch geneeskundige afdeling neurologie Radboudumc:
echografie van het diafragma en de carpale tunnel: waardevolle diagnostiek in de neurologie. (25 minuten)
3. Dr. Mariska Janssen, medior onderzoeker en Nicole Voet, revalidatiearts Klimmendaal en afdeling Revalidatie Radboudumc:
doe-het-zelf: ontwerp een exoskelet voor armondersteuning voor jongens met Duchenne (25 minuten)

Doelen:
- Leer welke mogelijkheden beschikbaar zijn om gamen toegankelijk te maken voor mensen met een beperking en hoe dit kan bijdragen aan het welbevinden van uw patiënt
- Leer over de nieuwste ontwikkelingen en mogelijkheden op het gebied van echografie bij spier- en zenuwziekten
- Krijg informatie over het ontwerpproces van een exoskelet
- Leer de wensen van de patiënt mee te nemen in het ontwerp van een exoskelet
- Leer hoe artsen en technici samenwerken in de ontwikkeling van medische hulpmiddelen

C3. Ambulatory 3D movement analysis using inertial sensors. Enabling 3D movement analysis in everyday clinical practice

Prof. dr. Jaap Buurke[1,2,3], MD Martin Oude Alink[3], Ir. Chris Baten[1], MSc Roelien Russcher[2], Dr Marc Nederhand[1,3]

[1]Roessingh Research And Development, [2]Department of Biomedical Signals & Systems, Technical Medical Centre, University of Twente , [3]Roessingh Rehabilitation Centre

C3. Mini-symposium: Ambulatory 3D movement analysis using inertial sensors. Enabling 3D movement analysis in everyday clinical practice, November 12, 2021, 9:05 AM - 10:05 AM

In current clinical practice, 3D movement analysis is an important tool to assess patients and guide clinical decision making. It provides objective data about individual walking patterns and effects of treatments aiming to improve walking. 3D movement analysis however is lab based, expensive and labour and time intensive. Wearable sensors are cheap and easy to apply within limited amount of time. As such, wearable sensors not only have the potential to replace expensive lab based 3D opto-electronic devices but also offer the possibility to assess individuals outside the lab during therapy or in their natural habitat. This symposium will combine knowledge from different projects targeting the use and development of wearable sensors for 3D movement analysis inside and outside the lab.

The first contribution focuses on the clinical applicability of IMUs and why it is clinically relevant to acquire kinematics (and kinetics) outside the lab. The latter is related to the Hawthorne effect, a type of reactivity in which individuals modify an aspect of their behavior in response to their awareness of being observed. This is followed by an overview of commercially available and newly developed systems and their suitability for 3D assessment in pathological gait. Finally the validity and usability of such a newly developped application will be presented and discussed. This will be the Portable Gait Lab, a 3 IMU set-up able to measure kinematics and kinetics in patients with an asymmetric gait (e.g. stroke).

Learning objectives:
1) Acquire knowledge about the advantages and disadvantages of using wearable sensors in 3D movement analysis.
2) Understand the added value of acquiring 3D data outside the lab.
3) Insight in the validity and usability of the Portable Gait Lab for patients after stroke.

Outline session

Introduction symposium
Chair: Prof. J.H. Buurke, PT, PhD.
3 min

Clinical applicability of IMUs for 3D movement analysis
Presenter 1: M. Oude Alink, MD
15 min

Commercially available and newly developed systems. Suitability for 3D assessment of pathological gait
Presenter 2: C. Baten, Ir
15 min

Validation study of the Portable Gait Lab for patients after stroke
Presenter 3: R. Russcher, MSc;

15 min

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

Total 60 min

C4. Impact through joint innovation, research and implementation: The Next Step for young patients (<25 years) with acquired brain injuries in need of rehabilitation treatment.

Dr. Menno Van Der Holst[1,4], Dr. Arend de Kloet[1], Msc Florian Allonsius[1,4], Christiaan Gmelig Meyling[2], Drs. Sandra Te Winkel[3]

[1]Basalt Rehabilitation, [2]De Hoogstraat Rehabilitation, [3]Merem, [4]Leiden University Medical Center

C4. Mini-symposium: Impact through joint innovation, research and implementation: The Next Step for young patients (<25 years) with acquired brain injuries in need of rehabilitation, November 12, 2021, 9:05 AM - 10:05 AM

Session description/introduction

Every year around 400/100.000 children, adolescents and young adults in the Netherlands suffer from acquired brain injury (ABI), including traumatic brain injuries (TBI) and non-traumatic brain injuries (nTBI). Consequences after onset may vary, but approximately 30% of these patients need help due to (often "invisible") daily life problems, which frequently results in referral to rehabilitation.

To guide the chain of care, a standard of care was developed for young patients with TBI in 2016. However, not all patients with ABI receive the care they need to counteract all their problems in daily life due to multiple causes, such as inadequate referral and/or variation in treatment strategies. In addition, many questions remain regarding the content and effects of (physical) rehabilitation interventions in young people with ABI. Furthermore, patients report a need for peer contact and more and better information, including 'return to participation'.

Therefore, we are currently in need of further developed guidelines to be able to provide 'the right treatment, at the right time, in the right place' for these young patients with ABI. To achieve this, multiple projects were started with the ultimate goals to provide uniformity and innovative treatment, better information provision and peer support. For these projects, multicenter research and collaboration has been set-up and novel ways of interpreting patient (and parent) reported outcomes have been created and the latest insights into rehabilitation treatment in this patient group has been investigated. In addition, the use of e-health and other innovative ways to improve peer support and information provision have been explored leading to new products to optimize care for patients with ABI.

This mini symposium brings together different experts from the field of ABI research, innovation and treatment in rehabilitation. They will share with other health professionals the latest insights in treatment, outcome interpretation, peer support and information provision (through e-health and other innovations) and the future vision for rehabilitation treatment in young people with ABI. This mini symposium will also be of interest to healthcare professionals interested in learning how to create collaborations and using innovations to enhance treatment in other chronic conditions.

Session outline and objectives:

Present and discuss:

- The path towards creating a uniform treatment for patients with ABI
- The use of outcome measures (participation, quality of life, fatigue and family impact) and optimizing their interpretation to enhance shared decision making in rehabilitation treatment

- The latest insight in physical rehabilitation interventions to enhance functional recovery and performance in daily functioning
- Novel ways to enhance peer support and information provision
- Improving psychoeducation/information on practical problems in daily life such as returning to participation
- The vision for the future of rehabilitation treatment for ABI in the Netherlands

Presentation titles and speakers:

- Introduction: Rehabilitation in young patients with ABI, where do we stand?
  (Chair: dr Arend de Kloet, Basalt) **3 minuten**
- Meedoen Next Step; towards the right care, at the right time, at the right place
  (dr Menno van der Holst, Basalt) **7 minuten**
- Outcome measures and their interpretation in Rehabilitation treatment
  (Florian Allonsius, Basalt) **10 minuten**
- Physical rehabilitation interventions in children and youth during subacute rehabilitation; outcomes of scoping review
  (Christiaan Gmelig Meyling, De Hoogstraat Revalidatie) **10 minuten**
- Breinstraat; an innovative way to facilitate peer expert support and information provision (dr Arend de Kloet Basalt/Patient partner) **10 minuten**
- The future of (e-)rehabilitation treatment for patients with ABI; the vision of HeJ (Sandra te Winkel, chair of the taskforce Hej, part of the “kindersectie VRA”). **10 minuten**
- Q&A **10 minuten**

C5. Rehab at work in progress

Prof. Coen Van Bennekom[1,2], Prof. dr. Michiel Reneman[3], PhD Harald Miedema[4], MD Ellen Roels[3], PhD Judith Mollet[2]

[1]Heliomare, [2]Amsterdam UMC, Universiteit van Amsterdam, Afdeling Public and Occupational Health, Coronel Instituut voor Arbeid en Gezondheid, Amsterdam Public Health research institute, [3]University Medical Center Groningen, Department of Rehabilitation Medicine, Center for Rehabilitation, [4]National Health Care Institute

C5. Mini-symposium: Rehab at work in progress, November 12, 2021, 9:05 AM - 10:05 AM

Session description+ learning objectives
Rehab at work in progress.
This session gives you an update on guidelines, reimbursement, measurements and innovative vocational activities.

Learning objectives:
- To have insight in vocational rehabilitation activities that can be part of reimbursable rehabilitation programs and can enhance work participation as well as health outcomes.
- To hear about the recently revised Dutch guideline on acquired brain injury (ABI) and work and the tasks of the rehabilitation professionals.
- To have knowledge about the measurement properties of the full and the brief version of the WORQ in persons with physical disabilities and the content validity of the WORQ for use in persons with spinal cord injury (SCI) specifically.
- To learn about 3 main components of successful vocational rehabilitation and how it is applied in Dutch care-as-usual for patients with musculoskeletal disorders (MSD).
- To hear about the Individual Placement and Support (IPS) method and its (possible) feasibility for use in people with ABI.

Chair/presenters
Chair: Coen van Bennekom

Presenter 1: Harald Miedema
Title of the presentation: Vocational rehabilitation activities within in Rehabilitation Care.

Presenter 2: Coen van Bennekom
Title of the presentation: How to implement the Dutch guideline on acquired brain injury (ABI) and work in daily practice.

Presenter 3: Ellen Roels
Title of the presentation: The Work Rehabilitation Questionnaire (WORQ): Measurement properties of the full and brief version in persons with physical disabilities and content validity for persons with spinal cord injury.

Presenter 4: Michiel Reneman
Title of the presentation: Evaluation of work- and economic outcomes of Dutch care-as-usual vocational rehabilitation with and without an additional work module for patients with chronic musculoskeletal disorders.

Presenter 5: Judith van Velzen
Title of the presentation: Individual Placement and Support in people with Acquired Brain Injury.

Outline session

The session starts with an overview of vocational rehabilitation activities focusing on improvement of work participation and their relationship with reimbursement under the Dutch healthcare insurance law. Secondly, the revised Dutch guideline on ABI and work is presented with special focus on the tasks of rehabilitation professionals.

The session continues how to assess work-related functioning. The WORQ consists of a selection of categories from the ICF. A comprehensive and a brief version are available [https://myworq.org]. The measurement properties in persons with physical disabilities will be presented. Furthermore, content validity of the WORQ in persons with SCI will be discussed.

The session ends with two practical examples of vocational rehabilitation:

-Vocational rehabilitation programs, for example in patients with chronic MSD, have 3 main components: work-directed rehabilitation, work modifications and service coordination. A work module is designed to go beyond 'clinic-based' rehabilitation and reimbursed by the employer. Worth the extra effort and costs?

-IPS is an effective method to support people with psychiatric disorders without an employer in finding and staying in paid work. It is now investigated whether IPS can also be used in people with ABI. An outline of IPS and the research that is performed will be presented.

C6. Gait analysis of tomorrow: Precision diagnostics using instrumented treadmill technology

Dr. Marjolein van der Krogt[1], Prof. Annemieke Buizer[1], Drs. Laura Oudenhoven[1], Drs. Eline Flux[1], Drs. Sjoerd Timmermans[1]

[1]*Amsterdam UMC, Department of Rehabilitation Medicine*

C6. Mini-symposium: Gait analysis of tomorrow: Precision diagnostics using instrumented treadmill technology, November 12, 2021, 9:05 AM - 10:05 AM

Clinical gait analysis is a common tool in rehabilitation medicine to unravel the underlying causes of gait problems in various patient populations. Typically, gait analysis is performed on an overground walkway of around 10m, but this limits the analysis to just a few steps of unperturbed, unfatigued walking at a comfortable pace. Recent advances such as the Gait Realtime Analysis Interactive Lab (GRAIL) allow for real-time analysis in a virtual environment on an instrumented treadmill, opening up new opportunities for advanced gait assessment in more challenging environments.

In this mini-symposium we present our recent scientific work using advanced treadmill technology, focusing on the effects of AFO tuning, the assessment of spasticity during gait, and the evaluation of gait problems that arise with longer walking and the occurrence of fatigue. Furthermore, we present how to apply this technology in a clinical rehabilitation setting, using standardized clinical protocols that help improve the diagnostics of complex gait problems. We focus on the application of these protocols in both paediatric and adult neurological populations.

Learning objective(s): Discover the latest advances in gait diagnostics using instrumented treadmill technology, learn about their theoretical background and recent research findings, and find out how to apply the developed protocols in your own clinical practice.

Presenters and session outline:

Prof. Annemieke Buizer, MD, PhD (chair):	Introduction to gait problems in rehabilitation medicine (5 min)
Marjolein van der Krogt, PhD:	How advanced technology can help improve gait diagnostics (5 min)
Laura Oudenhoven, MSc:	Stay Tuned! How do manipulations in ankle-foot orthosis alignment affect gait in children with cerebral palsy? (10 min)
Eline Flux, MSc:	Functional assessment of hyperreflexia using treadmill perturbations and the use of dynamic ultrasound in children with cerebral palsy (10 min)
Laura Oudenhoven, MSc:	Interaction between walking-induced fatigue and gait problems in children with cerebral palsy (10 min)
Sjoerd Timmermans, MD:	Prolonged walking assessment to understand the determinants of gait and balance problems in people with multiple sclerosis (10 min)
Interactive discussion	*(10 min)*

C7. Lifestyle in people with a disability: the role of the environment and data driven decision making.

Dr. Janneke Haisma[1]
[1]Spaarne Gasthuis, [2]Rijndam Revalidatie, [3]Martini Ziekenhuis, [4]Kennis Centrum Sport en Bewegen

C7. Mini-symposium: Lifestyle in people with a disability: the role of the environment and data driven decision making, November 12, 2021, 9:05 AM - 10:05 AM

This Mini Symposium will be organised by the VRA Werkgroep Bewegen en Sport (WVBS).

Aim: Speakers from both rehabilitation and corporate settings show us how the decisions we make are influenced by our environment and by the visualisation of data. With this knowledge we can help our patients make healthy choices.

Rationale:
Direct surroundings influence the choices we make: readily available delicious looking food invite us to choose a healthy option. Massive data collection and processing (e.g. on smart watches) also guide our decisions on hours of sleep or heart-rate while running.

A lifestyle with regular physical activity, sufficient sleep, and healthy eating behaviour is crucial for people with a disability; not only to preserve treatment effects but also to prevent the development of cardiometabolic diseases and other secondary health problems. However, a growing body of evidence points at unfavourable lifestyles in people with a physical disability.
Fortunately, rehabilitation professionals increasingly focus on promotion of a healthy lifestyle in their patients.
We feel that current lifestyle interventions may gain from strongly incorporating the environment (e.g. healthy options, peer support) and data driven decisions (e.g. physical activity trackers) to enhance long-term (cost-) effectiveness.

Chair:
Janneke Haisma, revalidatiearts Spaarne Gasthuis Haarlem, voorzitter WVBS

Programma:
Rita van den Berg-Emons, Associate Professor "Health-related physical fitness and lifestyle interventions", Erasmus MC en Rijndam RC.
Presentatie over onderzoek naar het effect van gedragsmatige interventies en objectieve dataverzameling (over activiteiten) bij mensen met een chronische aandoening.

Jeroen Pronk, directeur Centre of Expertise Healthy Ageing aan de Hanzehogeschool Groningen en oprichter van SamenGezond, een initiatief van Menzis.
Welke marketingstrategieën kun je toepassen om mensen aan te zetten tot gezond gedrag?

Deskundige op gebied gedrag:
Hoe bepaalt de fysieke en sociale omgeving de gezonde (on)bewuste keuzes die je maakt?

C8. Mitigating Post-Intensive Care Syndrome throughout the care continuum: state of the art and challenges for rehabilitation

Dr. Marike Van Der Schaaf[1,2], Dr. Bea Hemmen[3,4], MD Martijn Dremmen[3], Msc., PhD candidate Mel Major[1,2], Msc., PhD candidate Robin Kwakman[1,2]

[1]Amsterdam UMC, University of Amsterdam, Rehabilitation medicine, Amsterdam Movement Sciences, Meibergdreef 9, [2]Amsterdam University of Applied Sciences (HvA) Faculty of Health, Center of Expertise Urban Vitality, , [3]Zuyderland Medisch Centrum / Adelante Zorggroep, [4]Maastricht UMC

C8. Mini-symposium: Mitigating Post-Intensive Care Syndrome throughout the care continuum: state of the art and challenges for rehabilitation, November 12, 2021, 9:05 AM - 10:05 AM

Outline session: The audience will be taken at a patient journey through his rehabilitation trajectory from the ICU to his own home.

- Welcome by Marike van der Schaaf

- Rehabilitation for patients with the Post Intensive Care Syndrome from ICU to home; the state of the art. (10 minutes, including discussion by Marike van der Schaaf)

With the COIVD-19 pandemic the awareness of the urgency for a seamless rehabilitation trajectory for survivors of critical illness with the Post Intensive Care Syndrome has raised. In this presentation, an overview of the current state of the art on rehabilitation interventions will be provided.

- Rehabilitation in the ICU: walking towards independence using novel technology (10 minutes, including discussion by Robin Kwakman)

Ambulation training with critically ill patients is difficult because of muscle weakness, low exercise capacity and the attachment of medical and monitoring equipment. Using a mobile treadmill with the ability to support body weight may overcome the barriers and facilitate early ambulation training in critically ill patients, but does it shorten the recovery time of independent ambulation?

- Practical and organizational aspects of rehabilitation care at the hospital ward (10 minutes, including discussion by Martijn Dremmen)

Which practical and organizational challenges do we have to face in delivering the right rehabilitation care at the right moment at the right place, during hospital stay? In this presentation we will discuss possible problems to face, but also changes to take in improving the rehabilitation care for the critical ill patient in the hospital phase.

- Recovery at home: multidisciplinary rehabilitation interventions for patients with PICS in the community: REACH (10 minutes, including discussion by Mel Major)

How can we best provide rehabilitation interventions after hospital discharge for patients who have survived critical illness? An overview of the latest evidence on interdisciplinary, personalized interventions targeting health holistically, in light of a best practice example: the REACH network.

- Introduction to the VRA working group on PICS (10 minutes, including discussion by Bea Hemmen)

In this interactive session, the aims and actions of this new VRA working group will be discussed with the audience.

- Discussion Towards a seamless rehabilitation trajectory for PICS

Speakers and audience

Parallel sessie D

D1. The Right to Health in Rehabilitation Medicine: is your work, deparment or institute right to health proof?

Drs. Marga Tepper, MD Adriaan van Es, Karin Schepman, MD Esther Schutte
[1]UMCG, [2]IFHHRO

A2. Workshop: The Right to Health in Rehabilitation Medicine: is your work, deparment or institute right to health proof?, November 11, 2021, 2:10 PM - 3:10 PM

Chairs: Marga Tepper & Karin Schepman
Keynote speaker: Adriaan van Es MD, Secretary IFHHRO
Speaker Karin Schepman en Esther Schutte
Facilitators: Members of the VRA work-group Transcultural Rehabilitation Medicine Jos Dekker, Fons van Dijk, , Wim Otto and Alicia Lucardie

Learning objectives:
The participant is aware of the Right to the highest attainable standard of health (WHO)
The participant knows the background of the Right to health screening tool
The participant recognises the medical ethical dilemmas in daily practice arising from the Right to health assessment and is able to present recommendations to the department or institute management for implementation of Right to health

Introduction
Health workers in the field of Rehabilitation Medicine such as physicians, nurses and physiotherapists are firmly ‘rooted’ in their workplace, as most health workers are.

Besides their clinical work they face requirements like regular additional medical training for professional registration, legal- and regulatory demands. They are also expected to work according to the Human Rights Standards conceived in many European- and (Inter)national Conventions and other legal instruments. The right to the highest attainable standard of health (the Right to Health) is the most comprehensive instrument used to assess the human rights conditions of health practices.

Goal of the workshop
To introduce to the participants a Right to Health screening tool, especially designed for health workers. The tool will enable you to observe and assess your present – and perhaps future – workplace through the lens of international relevant human rights standards, and offer realistic steps for change to achieve these standards.

Outline of Session
Speaker 1: Adriaan van Es (15 min)
Title: The crucial role of health professionals in the implementation of the Right to Health

Short summary: Health professionals are often the first (and only) witness of violations of the Right to Health (and human rights in general). They are therefore in a unique position to contribute to the full realization of the Right to Health. Given their full agenda of clinical responsibilities, they require a workable and concise assessment and implementation tool.

Speaker 2: Karin Schepman/ Esther Schutte (15 min)
Title: the Right to health screening tool
Brief summary: the recently developed Right to health screening tool for assessment of your work will be introduced and some statements concerning daily practise in Rehabilitation Medicine will be discussed.
In groups (per group maximum 8 participants and 1 facilitator of the VRA work group Transcultural Rehabilitation medicine (WTCR) (25 min)
The participants work with the screening tool to get a first impression how right to health proof their work is. Participants will discover human right issues and discuss their daily practice using the Right to Health assessment tool.

Closure chairs M. Tepper and Karin Schepman (5 min)

Participants (max. 40 participants; 5 groups of 8 participants)
Healthcare workers interested in a right-based approach to rehabilitation service delivery.

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D2. “Finding better ways to put therapy into practice”: Over interactief en intensief oefenen van dagelijkse activiteiten in de kinderrevalidatie.

Ralph Boumann[1], Prof. Jan Willem Gorter[2], MD Inez van der Ham[3], - -[4], - -

[1]Rijndam Revalidatie, [2]CanChild Centre for Childhood Disability Research, McMaster Univeresity Hamilton, University Medical Centre Utrecht, [3]Rijndam Revalidatie, [4]Rijndam Revalidatie

D2. Workshop: “Finding better ways to put therapy into practice”: Over interactief en intensief oefenen van dagelijkse activiteiten in de kinderrevalidatie, November 12, 2021, 11:00 AM - 12:00 PM

Kinderen oefenen bij de kinderrevalidatie veel vaardigheden die ze nodig hebben voor het dagelijks leven (ADL). Het is een bekend verschijnsel in de (kinder)revalidatie, dat het lastig blijkt om hetgeen wat is aangeleerd in de therapiesituatie toe te passen in de eigen leefomgeving. Daarmee missen we kansen om het kind zich optimaal te laten ontwikkelen en te participeren. Diverse factoren spelen daarbij een rol. Het optimaliseren van therapie is een belangrijk onderwerp voor wetenschappelijke studies en projecten in Nederland en internationaal, zoals in Canada.

Zo is er bij Canchild Canada onderzoek gedaan naar de effecten van hoe en waar therapie wordt gegeven. Hier zijn mooie voorbeelden van blended care uit ontwikkeld, waarbij therapeuten vanuit behandelcentra werken met het kind en gezin om ADL te vergroten thuis, op school en in de communicatie. De “F-Woorden”-aanpak is daarbij een goed voorbeeld.

Op initiatief van twee ergotherapeuten bij Rijndam is het blended zorgpad “iADL” ontwikkeld. Hierbij kunnen zorgverleners live digitaal thuis meekijken wanneer het kind de ADL-taak uitvoert en ouders kijken mee met het oefenen op locatie. Hier wordt coaching toegepast en wordt meegekeken naar toepassingen in de omgeving. iADL sluit beter aan bij gezinnen verkleint de “gap”.

Leerdoelen:
- inzicht in de “F-Woorden”-aanpak als uitgangspunt voor nieuwe behandelvormen in de kinderrevalidatie
- beter zicht op de inrichting van interactieve behandelingen op een “blended wijze” zoals iADL.
- adviezen t.a.v. implementatie en opschaling van innovatief idee
- delen van ervaringen en aandachtspunten betrekken van gezinnen, skills voor betrokken therapeuten.
- delen van ervaringen over de blended care

Daarnaast willen we een multi-disciplinaire paneldiscussie houden over de ontwikkelingen van interactieve digitale toepassingen nu en in de toekomst. Op welke wijze kan dit de participatie van kinderen vergroten en hoe kunnen we hen bij ontwikkelingen betrekken? Welke lessen kunnen we trekken uit de ervaringen? Welke risico’s zijn er en hoe kun je die overwinnen?

Interactie met publiek, bijvoorbeeld door inzet van mentimeter, en eventueel op andere wijzes, afhankelijk van de ICT-ondersteuning die geboden wordt.

Programma:
5 minuten Introductie sprekers en probleemanalyse; leerdoelen door Inez van der Ham
10 minuten De F-Woorden aanpak en ervaringen met blended care vanuit CanChild, Canada
10 minuten Ontwikkeling blended “iADL” door ergotherapeut, vanuit Rijndam Revalidatie
5 minuten De implementatie & opschaling van het iADL-traject (op basis van het implementatieplan) door Ralph Bouwman

10 minuten De meerwaarde van iADL door ouder en/of kind: interview
5 minuten Lessen voor andere centra: Coachende vaardigheden: wat vraagt het van zorgverleners?
15 minuten Paneldiscussie: deelname Jan-Willem Gorter, CanChild Canada, hoogleraar kinderrevalidatiegeneeskunde, ergotherapeut(en)/ouder

Sprekers/deelnemers tijdens workshop:

- Prof. Jan Willem Gorter, MD PhD, rehabilitation physician, Director of the CanChild Centre for Childhood Disability Research, McMaster University Hamilton, visiting professor University Medical Centre Utrecht, the Netherlands.
- Inez van der Ham, MD, rehabilitation physician Rijndam Rotterdam
- Ouder en eventueel een kind die iADL-traject heeft deelgenomen of andere manier heeft geparticipeerd. (evt per film)
- Ergotherapeut(en)
- Nadere contacten worden gelegd maar zijn nog niet definitief ten tijde van indienen.
- Workshopvoorzitter: Ralph Bouman (Adviseur digitale zorg & innovatie)

D3. Wearable technology in upper limb stroke rehabilitation; innovative application in daily activities and at-home exercise.

Dr. Hans Bussmann[1], Dr. Carel Meskers[2], Dr. Anne Schwarz[3], Dr. Ruben Regterschot[1,4], Drs. Nienja Langerak[1], Dr. Eline van der Kruk[5]

[1]Erasmus MC, [2]Amsterdam University Medical Center, [3]University of Zürich, [4]University of Twente, [5]TU Delft

D3. Mini-symposium: Wearable technology in upper limb stroke rehabilitation; innovative application in daily activities and at-home exercise, November 12, 2021, 11:00 AM - 12:00 PM

After stroke intensive arm use and therapy is essential for gaining and retaining functional improvements. Because of high costs, shortage of therapists, patient burden and adherence issues, intensive arm treatment is scarcely applied, and this will become even more challenging in the future. Therefore, there is an urgent need for sustainable, technology-supported and motivating treatment and monitoring in the home setting, focusing on both daily life functioning and at-home exercise. Sensor technologies will be essential in creating this change.

In this minisymposium (chaired by Hans Bussmann) we will present and discuss with the audience current and future applications. Presentations (10 minute each) are:
1. Upper-limb stroke rehabilitation and technology: the clinician perspective (Carel Meskers)
2. Improving the amount of daily life arm use with objective activity feedback in stroke patients: The Arm Activity Tracker (Nienja Langerak)
3. Sensor-based assessment of the quantity and quality of arm use after stroke (Ruben Regterschot)
4. Upper limb movement quality measured with wearable: relationships with clinical assessments and daily life behaviour (Anne Schwarz)
5. Optimizing rehabilitation: the invisible therapeutic hand (Eline van der Kruk)

After the minisymposium attendees:
- have insight in the potential of technology (wearables and advanced anaytical techniques) in arm rehabilition after stroke specifically, and rehabilitation in general;
- have knowledge on an interactive tool for self-directed, home-based and personalized arm rehabilitation after stroke

D4. How transforming an electronic rehabilitation record can contribute to value based health care.

Dr. Paulien Goossens[1], Drs. Fenna Eefting[2], Drs. Susanne van Vegten[1], BSc Marcel Collombon[3], Dr. Erik Gerritsen[4]

[1]Merem Medische Revalidatie, [2]Vogellanden, [3]Asterisque, [4]ministerie VWS

D4. Mini-symposium: How transforming an electronic rehabilitation record can contribute to value based health care, November 12, 2021, 11:00 AM - 12:00 PM

Title:
How transforming an electronic rehabilitation record can contribute to value based health care.

Learning objectives:
Sharing a vision how data of medical records combined with personal health data can contribute to value based health care.

This mini symposium presents vision statements of VWS (Dutch ministry of Health), the RVS (council of public health) and two progressive rehabilitation centres in the Netherlands on this topic.

Learn how patient centric thinking changes the rules of the game!

Outline
An electronic rehabilitation record (e-RR) is the modern variant of a patient's chart. The ownership of the e-RR lies in the rehabilitation centre or hospital. Only a small part of medical data are shared with patients or other health care providers. An electronic personal health record (e-PHR) is owned by the patient himself and contains health information derived from multiple sources (like health records, own e-health apps, wearables and health devices). In theory, merging the e-RR with the patient's e-PHR provides promising possibilities for analysing data to more relevant information for both healthcare providers and patients.
It is to be expected that, using an e-PHR, patient care and health outcomes will improve, without unwanted privacy aspects.

Also, with an e-PHR, long term follow up and monitoring on patients progress and wellbeing can be realised without unnecessary visits to outdoor patient clinics. Self-reliance of patients will increase when patients really own their medical data, leading to better-informed decision making.
These developments help in realizing more patient centred health care, that is efficient and less costly.
In the long run artificial intelligence might help to better understand the relation between treatment protocol and patient outcome for various patient groups and the ability to adapt treatment accordingly.

It is clear that VWS is stimulating healthcare institutes and hospitals with all kinds of tools to move into this direction. It is up to the healthcare sector to embrace this vision and realise it. However, the way forward is a bumpy road.

Hosted by a professional journalist known from television news items, in this webinar the audience is invited to discuss the different views on this topic with VWS and RVS together with frontrunners in the rehabilitation sector how to realise this together and set an example in Dutch Healthcare.

For all, rehabilitation is positioned as an unique position between cure and care, with motivated patients who are driven to pick up their life again in a new setting, using all data and tools that are given to them, including e-health.

Chairman: P.H. Goossens (RvB Merem en revalidatiearts)

Speakers:
F. Eefting (Voorzitter RvB Vogellanden) and S. van Vegten, (voorzitter RvB Merem): a new rehabilitation health care record. A vision on patient centred care.
M. Collombon (Aratame, Asterisque): New possibilities in health care record systems.
E. Gerritsen (SG ministerie VWS): Digital presence: The national vision on future health care records.

D5. Boosting Performance With High-End Interactive Gait Rehabilitation Technology

Dr. Maarten Prins[1], Dr. Noel Keijsers[2], Eline Zwijgers[2], Dr. Anke van Bladel[3,4], Dr. Juha Hijmans[5], Marissa Gerards[6,7,8], Ilona de Rooij[9,10]

[1]Military Rehabilitation Center, dept. Research & Development, [2]Sint Maartenskliniek, dept. Research & Innovation, [3]Ghent University Hospital, [4]Ghent University, Dept Rehabilitation Sciences, [5]Groningen University Medical Center, Dept. Rehabilitation, [6]Care and Public Health Research Institute CAPHRI, Department of Epidemiology, [7]Maastricht University, NUTRIM School of Nutrition and Translational Research in Metabolism, Department of Nutrition and Movement Sciences, [8]Maastricht University Medical Centre, Dept of Physical Therapy, [9]Revant Rehabilitation Centres, [10]Center of Excellence for Rehabilitation Medicine, UMC Utrecht Brain Center, University Medical Center Utrecht, and De Hoogstraat Rehabilitation

D5. Mini-symposium: Boosting Performance With High-End Interactive Gait Rehabilitation Technology, November 12, 2021, 11:00 AM - 12:00 PM

SESSION DESCRIPTION:

Description:
In the past decade, the use of high-end gait rehabilitation technology has increased rapidly. From a global perspective, the density of these high-end systems is exceptionally high in the BeNeLux. This cultural, linguistic and spatial proximity between sites facilitates collaborations which in turn accelerates the development of interventions. During this session, Dutch and Belgian members of the HEIGaRT (High-End Interactive Gait Rehabilitaton Technology) User Group will present how these systems are used to boost performance in patients and healthy individuals.

Objectives:
- Give an overview of the possibilities of high-end interactive gait rehabilitation technology
- Present the results of intervention studies that aimed to enhance performance in stroke patients, patients with incomplete spinal cord injury and patients with running related injuries
- Discuss the advantages and disadvantages of these interventions compared to conventional interventions

CHAIRS/PRESENTERS:

Chairs:
Dr. Maarten Prins (Military Rehabilitation Center), chair of the HEIGaRT usergroup
Dr. Noël Keijsers (Maartenskliniek), senior member of the HEIGaRT user group

Presenters:
Anke van Bladel (Ghent University Hospital).
Full body movement analysis of stroke patients when walking on a self-paced treadmill.
Ilona de Rooij (Revant).
Walking ability in relation to participation after stroke. Is there a role for virtual reality?
Eline Zwijgers (Maartenskliniek).
Walking adaptability training compared to endurance-and-resistance training in people with incomplete spinal cord injury.
Juha Hijmans (Groningen University Medical Center).
Gait retraining in running related injuries.
Marissa Gerards (Maastricht University Medical Center).
Perturbation-based balance training to improve balance control and reduce falls in older adults.

OUTLINE SESSION:

Outline:
An ongoing debate about the usage of instrumented treadmills has been the effect of this technology on the walking pattern. This argument has been settled for healthy individuals and children with Cerebral Palsy, supporting the use of the technology. Anke van Bladel will discuss the findings of a recent study to evaluate this effect on a considerably older population after stroke. Ilona de Rooij will present an overview of her PhD in which she examined feasibility and effect of virtual reality gait training on walking ability and participation in people after stroke and provides implications for clinical practice. Eline Zwijgers will present the results of an RCT in which she studied the effect of walking adaptability training on a GRAIL-system on walking capacity, functional ambulation, and participation in patients with incomplete spineal cord injury, compared to endurance-and-resistance training. Juha Hijmans will demonstrate how real-time feedback can be used to normalize atypical eversion of the rearfoot during running, which is a known risk factor for running-related injuries. Marissa Gerards will present the results of an RCT in which a CAREN-system was used for perturbation based balance training in older adults to reduce falls.

Programme:

11:00 – 11:05 Noël Keijsers and Maarten Prins: Welcome
11:05 – 11:15 Anke van Bladel: Full body movement analysis of stroke patients when walking on a self-paced treadmill.
11:15 – 11:25 Ilona de Rooij: Walking in relation to participation after stroke; is virtual reality training of added value?
11:25 – 11:35 Eline Zwijgers: Walking adaptability training compared to endurance-and-resistance training in people with incomplete spinal cord injury.
11:35 – 11:45 Juha Hijmans: Gait retraining in running related injuries.
11:45 – 11:55 Marissa Gerards: Perturbation-based balance training to improve balance control and reduce falls in older adults.
11:55 – 12:00 Wrap up

D6. Cochrane Rehabilitation: making a difference to the world of Rehabilitation

PhD Fieke Sophia Koopman[1], MD Carlotte Kiekens[2], Prof Stefano Negrini[3,4], MD, PhD Judith Vloothuis[5], Prof Maurits van Tulder[6]

[1]Department of Rehabilitation Medicine, Amsterdam UMC, [2]Montecatone Rehabilitation Institute, [3]Department of Biomedical, Surgical and Dental Sciences, University La Statale, [4]IRCCS Istituto Ortopedico Galeazzi, [5]Amsterdam Rehabilitation Research Centre, Reade, [6]Faculty of Behavioural and Movement Sciences, Vrije Universiteit Amsterdam

D6. Mini-symposium: Cochrane Rehabilitation: making a difference to the world of Rehabilitation, November 12, 2021, 11:00 AM - 12:00 PM

Cochrane Rehabilitation is a Field formally approved by Cochrane on October 22nd, 2016. Cochrane Rehabilitation serves as a bridge between Cochrane and all Rehabilitation stakeholders. On one side, it drives evidence and methods developed by Cochrane to the world of Rehabilitation, and on the other, it conveys priorities, needs and specificities of Rehabilitation back to Cochrane.
Cochrane Rehabilitation recognizes strengthening the methodology relevant to evidence-based clinical practice as one of its main goals. The need to improve the quality of conduct and reporting in rehabilitation research has been highlighted by several Cochrane Rehabilitation research activities. For example, issues such as low replicability of randomized controlled trials and desired items relevant in reporting have been underlined in a scoping review, a research study and two reviews. To answer to these needs, Cochrane Rehabilitation has launched the Randomized Controlled Trial Rehabilitation Checklists (RCTRACK) project aimed at producing a specific reporting guideline in rehabilitation.
This project and other interesting Cochrane Rehabilitation projects will be presented and the mission and working areas of the Cochrane Rehabilitation will be outlined in this mini-symposium. Two Cochrane authors of Cochrane systematic reviews will present their work and share their experience of writing Cochrane Systematic Reviews.

Programme
Session chair: Fieke Sophia Koopman, MD, PhD (Cochrane Review author)

Mission and working areas of Cochrane Rehabilitation
Carlotte Kiekens, MD (Co-Director Cochrane Rehabilitation)
Montecatone Rehabilitation Institute, Imola (Bologna), Italy

Cochrane Rehabilitation's special projects
Prof. Stefano Negrini, MD (Director Cochrane Rehabilitation)
Department of Biomedical, Surgical and Dental Sciences, University La Statale, Milano, Italy.
IRCCS Istituto Ortopedico Galeazzi, Milano, Italy

The impact of Cochrane Rehabilitation Reviews (1): caregiver-mediated exercises for improving outcomes after stroke
Judith Vloothuis, MD, PhD (Cochrane Review author)
Amsterdam Rehabilitation Research Centre, Reade, Amsterdam, The Netherlands

The impact of Cochrane Rehabilitation Reviews (2): twenty five Cochrane reviews on Low Back Pain
Prof. Maurits van Tulder (Cochrane Review author since 1996)
Faculty of Behavioural and Movement Sciences, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

Objectives:

1. To learn more about the mission and working areas of Cochrane Rehabilitation
2. To gain insight into a selection of special Cochrane Rehabilitation projects
3. To learn about the impact of Cochrane Rehabilitation Reviews and share experiences with the Cochrane authors

D7. Hanky, panky .... tDCS

Prof. dr. Gerard Ribbers[1], dr. Ruud Selles[1], MSc Joris van der Cruijssen[1], MD Zeb Jonker[1], MD. PhD Rick van der Vliet[1]
[1]*Erasmus Mc*

D7. Mini-symposium: Hanky, panky .... tDCS, November 12, 2021, 11:00 AM - 12:00 PM

tDCS is a form of non-invasive neurostimulation that delivers a low electrical current to the brain through the use of electrodes placed on the scalp. It is considered to inhibit or excite neural activity, and to improve neuroplasticity. We have performed some the largest RCTs ever to examine the effects of tDCS on recovery after stroke with aphasia and motor performance as primary outcomes but failed to establish any effect. In depth analysis failed to identify subpopulations that might be responsive to tDCS. We examined whether the montage of the electrodes could be personalized, whether cerebellar stimulation might have a positive effect via the cerebellar-frontal loops and whether we could measure any effect on cortical excitability with tMS in 4 successive PhD projects. In this minisymposium we will summarize our research on tDCS to conclude that we found little support that it actually enhances brain performance.

D8. Rehabilitation and technology: innovating and co-creating with colleagues and clients

Dr. Henk Seelen[1,2], Drs. Jule Elmanowski[1,2], Dr. Barbara Piskur[3], Dr. Eva Geurts[4], Dr. gustavo roveloruiz[4]
[1]Adelante Zorggroep, [2]Maastricht University, [3]University of applied sciences Zuyd, [4]Hasselt University

D8. Mini-symposium: Rehabilitation and technology: innovating and co-creating with colleagues and clients,
November 12, 2021, 11:00 AM - 12:00 PM

The possibilities and added value of new technologies in rehabilitation are numerous. However, many new developments eventually do not reach our rehabilitation teams or patients. Often, newly developed technology does not fit because it is not tested with patients; not useful for the indicated purpose or target group; or possibly even harmful. Technology development within the context of and in close collaboration with rehabilitation practice is therefore important.

To facilitate the development and implementation of rehabilitation technology within the context of rehabilitation care, the consortium i2-CoRT (www.i2-CoRT.eu) was set up. I2-CoRT stands for Innovation and Implementation acceleration for Complex Rehabilitation Technology. The consortium facilitates international collaboration between rehabilitation centres, knowledge centres, (SME) businesses, health care and patients organizations in the Netherlands, Belgium and Germany, and was funded by the Interreg V-A Euregion Meuse-Rhine program of the European Union.

In this mini-symposium new developments by the I2-cort consortium in robot and sensor technology-assisted arm-hand rehabilitation, virtual reality and 3D-printing will be shown.

Learning objectives:

- To learn about the concept of a clinical rehabilitation test centre, developed to facilitate the development and implementation of rehabilitation technology within rehabilitation practice;
- To learn about new technology-assisted rehabilitation approaches that have been developed in the i2-CoRT context, including the treatment concepts behind them;
- To reflect on future developments and challenges in rehabilitation medicine to secure excellent care to clients, and reflect on lessons learned during the i2-CoRT project.

Chair of session: Dr. Henk Seelen

Titles and speakers:
"The i2-CoRT test centre concept";
Dr. Henk Seelen, Adelante Zorggroep / Maastricht University:

"ReHab-TOAT: Task-Oriented Arm Training using nuclear energy reactor technology",
Drs. Jule Elmanowski, Adelante Zorggroep / Maastricht University:

"Designing and development of a robot-assisted rehabilitation software: Converting patients' and therapists' needs"
Gustavo.Rovelo-Ruiz, Hasselt University, Belgium
Eva Geurts, Hasselt University, Belgium

"VR and 3D printing opportunities: Co-creating (bespoke) patient rehabilitation technology"
Dr. Barbara Piskur, Zuyd University of Applied Sciences:

P01

The effect of robotic enhanced error training on arm function in people after stroke

Drs. Sanne Ettema[1], Dr. Melvyn Roerdink[2], Prof. Dr. Han Houdijk[3], Dr. Janneke Nachtegaal[1], Prof. Dr. Coen van Bennekom[1,4]

[1]Heliomare Research and Development, [2]Department of Human Movement Sciences, Faculty of Behavioral and Movement Sciences, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, [3]University of Groningen, University Medical Center Groningen, Center for Human Movement Sciences, [4]Coronel Institute of Occupational Health, Academic Medical Center, University of Amsterdam

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Topic

People after stroke often show reduced functionality of their paretic arm. Despite the development of several treatment methods, full recovery of arm function is often not achieved in many patients, especially not in those who are severely affected. Therefore, Heliomare rehabilitation center aims to investigate the effectiveness of a new robotic system (DeXtreme, BioXtreme LTD, Israel) on improving severely affected arm function after stroke.

Relevance

The DeXtreme is a robotic arm including a force sensor and virtual reality feedback screen that can augment movement errors during reaching tasks. This is believed to make errors more perceptible, thus enhancing movement correction. It is expected that DeXtreme enhanced error training can improve arm function after stroke due to stimulation of motor learning processes.

Current status

A protocol for a randomized controlled trial has been developed. Two groups of stroke patients will receive two weeks of DeXtreme robotic training as adjunct to usual care, with three 20-minute sessions per week. One group will perform regular reaching tasks using the DeXtreme without error enhancement, whereas the other group will perform reaching tasks with augmentation of movement errors. Scores on Action Research Arm Test, Fugl-Meyer and Motor Assessment Scale will be compared between groups before and after the training period, as well as training performance and experience.

Plan of action

We will use the results of our RCT study to decide whether this specific type of training should be implemented in usual care of rehabilitation centers to improve severely affected arm function after stroke.

P02

Making of a mixed reality patient education intervention for patients with spinal cord injury

MD JF (Joost) Baardman[1], PT MSc J (Joep) Janssen[1,2], JJ (Anneke) Collet[3], BSc K (Klaas) Wit[3], PT PhD SA (Sacha) van Langeveld[1], MD PhD JM (Janneke) Stolwijk-Swüste[1]
[1]Rehabilitation Centre De Hoogstraat, [2]Holomoves, [3]Patient expert

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction
The human body is complex to understand, imagine the challenge for patients with spinal cord injury to understand the consequences of the injury to their bodies. Effective counselling is essential for long-term health. Conventional education methods, however, have barriers. Interactive patient education interventions using Mixed Reality (MR) strengthen knowledge transfers with three-dimensional human-like visuals (holograms) and can be used at a convenient time for the patient and its caregiver.

Methods
Authors created the first MR patient education app explaining the basic consequences of a spinal cord injury, focusing on locomotion, sensation, organ function and autonomic changes. In this process, patients, rehabilitation therapists and physicians were involved to determine the requirements of effective MR patient education. An iterative development process in cooperation with an MR software developer followed.

Results and discussion
10 patients and 8 rehabilitation professionals were interviewed to determine requirements about the content, visual aspects and usability of the app. An interactive hologram to visualize the injury and its primary consequences was created in MR and supported by textual and auditory explanations. The first experiences of patients in a pilot study are promising. Furthermore, there is potential for expansion (for example adding detailed modules about consequences for neurogenic bladder problems).

Conclusions
Patients and professionals believe that interactive, visually supported patient education interventions using MR are beneficial in the knowledge transfer in the subacute inpatient rehabilitation period after spinal cord injuries. MR can offer this. The next step is to evaluate it in daily practice and to expand it.

P03

Is the wheelchair ergometer of added value in adjustments for manual wheelchair use?

MD Esther Schutte[1], MSc K. van Hutten[1], MSc M. van Dilgt[,2], MD F. Harberts[1], PhD M.A.M. Berger[1,2]
[1]Basalt, [2]The Hague University of Applied Sciences

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Topic:
Creating a wheelchair propulsion lab to contribute with objective data in advising wheelchair adjustments, propulsion technique and physical training. The wheelchair ergometer (Lode, Esseda) is used and patients are measured with their own manual wheelchair for daily use, with or without electric support.

Relevance:
Wheelchair adjustments are mainly based on expert opinion, obtained from observation in passive position. To contribute to the advice for all clinicians involved in the process of training, prescribing or adapting a wheelchair, we aim to add objective propulsion data to analyze the interface of user and wheelchair in action. A well-adjusted wheelchair can contribute to an active lifestyle, avoiding overload and maximal participation in society.

Current status:
Protocol consisted of 30s sprint, driving at comfortable speed and maintaining given constant speed. Outcome parameters are max and mean power, speed and force; push frequency; right-left asymmetry; contact time on rim; cycle duration. Video and pictures from left lateral side and backside are obtained to analyze symmetric position and upper body movement during drive. Eleven patients were measured, some repeated after adjustments.
Wheelchair ergometer is of most added value to referral questions related to efficiency. For example:
- Can sprint capacity be improved?
- Pain in upper extremity: indications for overload?
- Adding electrical support?
- Asymmetry in propulsion?

Plan of action:
To gain more knowledge about the individual efficiency of the wheelchair user we aim to add the cardiopulmonary exercise test. For the interface we plan to use the wheelchair ergometer for training.

P04

Outcome registry of Early Intensive Neurorehabilitation in patients with Disorders of Consciousness: design of the DOCTOR study.

Drs. Danielle Driessen[1,2], PhD Cecile Utens[1,2], Prof (MD) PhD Gerard Ribbers[2,3], MD PhD Willemijn van Erp[1,4,5], PhD Majanka Heijenbrok-Kal[2,3]

[1]Libra, Rehabilitation & Audiology, [2]Department of Rehabilitation Medicine, Erasmus MC, [3]Rijndam Rehabilitation, [4]Radboud University Medical Centre, [5]Accolade Zorg

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Approval of Medical Ethical committee of Erasmus MC Rotterdam (Reference number MEC-2019-0127).

Prolonged disorders of consciousness (PDOC) may occur after severe brain injury. Patients with PDOC may benefit from early intensive neurorehabilitation (EIN), available for patients >25 years since January 2019. In the Netherlands, the EIN programme is provided by one rehabilitation centre (Libra Rehabilitation, location Leijpark) and forms the starting point of a dedicated chain of specialised rehabilitation and care.

What are the short- and long-term outcomes of patients with PDOC who receive EIN?

DOCTOR is a cohort study with a 2-year follow-up period, including patients aged ≥16 years and have PDOC due to acute brain injury. At least 72 patients will be included. Outcomes that are measured are 1) the changes in level of consciousness over time; 2) the frequency and type of medical complications; 3) mortality; 4) level of disability, 5) including the level of motor, cognitive, behavioural and emotional functioning; 6) participation; 7) quality of life; 8) self-efficacy of informal caregivers and informal caregivers' strain; and 9) cost-effectiveness of the programme. Measurements will take place at start EIN, in week 5, 10, and at discharge from EIN and at 4 time points over 2 years.

This study will provide insight in the recovery patterns and predictors of recovery for multiple outcomes in PDOC patients following EIN. The results of the study will enable us to benchmark and improve EIN and the organisation of the health-care chain, both for patients with PDOC and for their families.

P05

Central recovery after peripheral nerve damage in neuralgic amyotrophy, a randomized controlled trial (RCT)

drs. Renee Lustenhouwer[1,2], dr. Ian Cameron[2,3,4], dr. Nens van Alfen[5], prof. dr. Ivan Tony[2], prof. dr. Sander Geurts[1], prof. dr. Baziel van Engelen[5], dr. Rick Helmich[2,5], Dr. Jan Groothuis[1]

[1]Department of Rehabilitation, Radboud university medical center, Donders Institute for Brain, Cognition and Behavior, [2]Donders Centre for Cognitive Neuroimaging, Donders Institute for Brain, Cognition and Behavior, Radboud University, [3]Donders Centre for Neuroscience, Donders Institute for Brain, Cognition and Behavior, Radboud University, [4]Faculty of Electrical Engineering, Mathematics and Computer Science, University of Twente, [5]Department of Neurology, Radboud university medical center, Donders Institute for Brain, Cognition and Behavior

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction

Neuralgic amyotrophy is a common peripheral nerve disorder caused by auto-immune inflammation of the brachial plexus, clinically characterized by acute pain and weakness of the shoulder muscles, followed by motor impairment. Recently, we have empirically confirmed the clinical suspicion that NA patients with residual motor dysfunction have abnormal central sensorimotor representations related to their affected limb and residual symptoms.

Objective

to determine whether the cerebral abnormalities associated with NA can be normalized through specialized rehabilitation focused on relearning motor control, as compared to usual care.

Patients

27 neuralgic amyotrophy patients with persistent, lateralized symptoms in the right upper extremity

Methods

A randomized controlled trial, comparing specialized rehabilitation (n=16) to usual care (n=11). We used task-based functional MRI and a hand laterality judgment task, which involves motor imagery and is sensitive to sensorimotor cerebral changes in neuralgic amyotrophy.

Results

Overall, neuralgic amyotrophy patients had improved task performance and increased activity in visuomotor occipito-parietal brain areas at follow-up compared to baseline during motor imagery. Although patients in the specialized rehabilitation group showed greater improvement in clinical outcome than patients in the usual care group, there were no significant group differences in change in behavioral task performance or related brain activity.

Discussion and conclusions

The results indicate that cerebral sensorimotor abnormalities after peripheral nerve damage in neuralgic amyotrophy are amendable to treatment. And specialized rehabilitation may facilitate recovery in neuralgic amyotrophy patients.

Clinical message

Rehabilitation interventions that apply visuomotor strategies to improve sensorimotor integration may help to treat neuralgic amyotrophy patients.

P06

Effectiveness of an outpatient multidisciplinary rehabilitation program in patients with neuralgic amyotrophy: a randomized controlled trial (RCT).

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Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction: Patients with neuralgic amyotrophy (NA) often experience severe upper extremity (UE) pain and paresis, fatigue, and limitations in UE functioning. Functional recovery is usually slow and often incomplete. We designed an outpatient multidisciplinary rehabilitation program specifically for patients with NA aimed at relearning motor control and self-management strategies.

Objective: To assess the effect of an outpatient multidisciplinary rehabilitation program, consisting of self-management strategies and regaining motor control, compared to usual care in patients with NA to minimize long-term complaints and disabilities.

Patients: Forty-seven patients (18 women) with right-sided brachial plexus NA (mean age 43.6 ± 12.10 years).

Methods: Single-center RCT, in which patients were randomized into an intervention or control (usual care) group and followed over a period of 17 weeks. Primary outcome was the Shoulder Rating Questionnaire (SRQ), measuring functional UE capacity. Secondary outcomes included measures of pain, fatigue, participation, reachable workspace and UE muscle strength. ANCOVA was used for analysis with correction for SRQ baseline, sex and age.

Results: We found a significantly larger SRQ improvement in the intervention compared to the control group ($F(1,35)= 4,41$, $p = .044$). Analysis of secondary outcomes is ongoing.

Discussion: Our results demonstrate the effectiveness of an outpatient multidisciplinary rehabilitation program to improve UE motor control and daily functioning in patients with NA.

Clinical message: Patients with long-term disability and pain after brachial plexus NA may benefit from a targeted outpatient multidisciplinary rehabilitation program using self-management strategies.

P07

Evaluating Communication Partner Training (CPT) in healthcare centers

PhD Maren Van Rijssen[1]
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Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction
About one third of people who suffer a stroke acquire aphasia, a language disorder. People with aphasia often face the inaccessibility of communicating with their healthcare professionals (HCP). Communication between people with aphasia and HCP can be greatly improved when HCP receive Communication Partner Training (CPT) and learn to use a more inclusive communication style.
Objective
The objective of this multi-center implementation project was to identify the mechanisms that facilitate or build up barriers for HCP to use a more inclusive communication style after CPT.
Methods
An explorative qualitative research design was chosen and semi-structured interviews were used to collect the data. The CPT intervention 'CommuniCare' was implemented in five healthcare centres. 254 HCP were trained to use supportive conversation techniques. 24 HCP participated in interviews.
Results
Three themes were identified to describe HCPs' perspectives on the mechanisms that led to the use of supportive conversation techniques after Communicare. The remaining findings show HCPs' perspectives on the barriers to use supportive conversation techniques.
Discussion and conclusions
The data in this study were used to inform the development of setting specific implementation plans to continue the use of an inclusive communication style in healthcare settings. In this presentation we will show how healthcare settings can enhance the communication skills of their HCP.
Clinical message
Healthcare settings wishing to enhance HCPs' communication skills should first consider enhancing HCPs' opportunities for experiential learning. Second, healthcare settings should consider appointing implementation support practitioners. These two points will be explained further in our presentation.

P08

The mini-bestest reactive balance score: discriminative capacity and concurrent validity in the chronic phase after a minor stroke

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Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction
Reactive stepping is an important saving strategy to prevent falling. Lab-based studies showed pronounced deficits in reactive stepping capacity after stroke. Here, we tested whether the reactive postural control subtest of the Mini-BESTest (MBT-RPCS) is a valid clinical alternative.

Objective
To investigate:1) discriminative capacity of the MBT-RPCS between minor stroke patients and healthy controls,
2) concurrent validity of the MBT-RPCS against a 'gold standard' lab-based reactive stepping test.

Participants
We included 75 participants in the chronic phase after minor stroke, defined as (near-) full recovery on Fugl-Meyer Assessment–Lower extremity (score≥24). Healthy individuals (n=51) served as controls.

Methods
Participants underwent two tests for reactive stepping capacity. The MBT-RPCS assessed stepping responses following manually-delivered perturbations. The lab-based stepping test included standardized perturbations (backwards and towards paretic side) of increasing intensity using an adjusted treadmill. Main outcome was the multiple stepping threshold (MST). Discriminative capacity was determined by ANCOVA, with age as a covariate. Concurrent validity was determined with Kendall's Tau-b correlation coefficients (τb).

Results
MBT-RPCS sum score was significantly lower in the minor stroke group versus controls, $F(1,123)=4.428$, $p=0.037$. No significant correlations were found between MBT-RPCS and MST in the minor stroke group ($\tau b \leq 0.075$).

Discussion and conclusions
The MBT-RPCS shows good discriminative capacity. However, absence of correlation with the 'gold standard' indicates MBT-RPCS might not reflect the true reactive balance capacity of minor stroke patients.

Clinical message
The MBT-RPCS may be used for the screening for reactive stepping capacity in minor stroke patients in clinical settings. Validity might improve by standardization.

P09

RYSEN: an innovative robotic system enabling early intensive gait training during rehabilitation

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic
Rehabilitation programs often focus on regaining safe gait in compliance with motor learning principles. Evidence supports the benefits of intensive, repetitive and task-specific gait training early during rehabilitation. However, early gait training is often limited in frequency and duration, as certain levels of muscle strength, balance and coordination are required to start walking. The recent introduction of the RYSEN 3D body weight support (BWS) system holds promise to facilitate intensive and task-specific training early during rehabilitation.

Relevance
The RYSEN is an innovative BWS system that enables freedom of movement in all directions without disturbing natural gait. Patients who cannot bear their body weight and require full therapeutic assistance can now safely practice independent walking. Moreover, the RYSEN allows for task-specific training, with assistance as needed, due to a range of features (e.g. adjustable BWS, lateral stabilization, horizontal forces). This may promote optimal recovery while reducing therapeutic workload.

Current status
The RYSEN is implemented as part of daily treatment practice in Heliomare rehabilitation center for several disciplines, i.e. stroke, spinal cord injury and amputation. Weekly, 20-25 patients perform one hour of RYSEN training as adjunct to usual care.

Plan of action
Scientific research will be performed to compare RYSEN and conventional training, looking at training intensity, task-specificity and experiences. Moreover, the optimal application of RYSEN features will be investigated in cross-sectional studies as well as their contribution to improving gait. Outcomes will contribute to the development of training protocols and further implementation of the RYSEN.

P10

Possibilities of using the Rollz Motion Smart for gait analysis in rehabilitation for stroke patients

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic
The Rollz Smart Motion rollator detects posture, gait and activity of a user and provides feedback. This rollator includes various programs to train the user and optimize walking performance but can also be used for measuring gait analysis parameters like velocity, step time, step length, distance between person and rollator. Visible, tactile and auditory cues help the user to take the first step or maintain a suitable walking rhythm.

Relevance
Feedback on gait patterns can be given directly and indirectly while using the walking aid, assisting patients with mobility impacting disabilities and supporting professionals. This feedback can help in implementing and evaluating treatments to improve gait. It can also stimulate people to walk.

Current status
The Rollz Smart Motion rollator can monitor velocity, step length and time in a reliable and valid way. An app is being developed to give users feedback on outcome parameters as total distance walked, number of steps, duration of walking and speed. Different cues, especially for Parkinson patients, can be given during walking.

Plan of action
For optimal rehabilitation of the patient's gait pattern, it is important that feedback is given on parameters which are specifically relevant for the patient group involved. Choice of outcome parameters for different patient groups should be made. For the further development of the walking module, the developer and the users (patients and therapists) have to work very closely on the realization of the app and feedback cues. User group research has to be carried out in the future.

P11

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

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic
To support patients to attain a more active lifestyle during and after their rehabilitation treatment, a LivingLab was set up to provide appealing and challenging physical activities.

Relevance
An active lifestyle improves the outcomes of rehabilitation and helps to prevent health problems in the future. Our LivingLab provides a physical location to develop, test and evaluate innovations by means of action research, with a community of practice (CoP) in order to investigate what works best for a more active lifestyle in a real-life setting.

Current status
Our LivingLab, is a ±400 m2 multi-purpose, open space, at the heart of the building.
So far, we've achieved: development and implementation of various products/services that support an active lifestyle. Among those; a silent disco, smartclips and a stairs challenge and a meeting point with barista to attract more people. A CoP, supporting the action research process, with patients, students and lecturers, health professionals and other stakeholders has an active role from ideating to reporting and proved vital to the success of the project.

Plan of action
A manual has been written to assist rehabilitation researchers to execute action research and will be implemented. Our current focus is on reviewing what products work best to engage people. We will create a guideline for other locations of Basalt in selecting suitable products. Spin-offs to other areas include sporting facilities on our rooftop and design of a more activity friendly environment adjacent to our facility. Ideas on healthy food are forming and will be developed.

P12

The Abel_pro 2.0: an eHealth solution for the network rehabilitation process

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic: Development of a multi-exercise device with sensors for special target groups like people with standing and/or walking problem (e.g. elderly, patients with MS). Complemented with an analogue-digital environment in which therapist from secondary care and primary care can work together, with the patient, on an optimal and personalized training program but also safely store data.

Relevance: Network rehabilitation is difficult as professionals do not have direct insight in the outcomes outside the own organization. Using innovative and eHealth related techniques in the Abel_Pro, network rehabilitation process is possible.

Current status: In the first stage the Abel_pro was developed. It is an innovative, compact and mobile multi-exercise training device with several settings and support options for performing 5 different exercises to be used in care centers as well as in home situation. In addition, a digital training program was developed, which can be personalized for specific users. The Abel_pro was successfully tested in daily rehabilitation practice. Currently, the development process is in the second stage. During this stage different sensors for quantifying and qualifying movements are attached to the Abel_pro.

Plan of Action:
In the next stage an interactive dashboard will be developed. Measurement data from the sensors are transferred to the dashboard. Patients and their therapist both can control performance and implement new interventions through the dashboard. An automatic registration system will be developed enabling safe data-exchange with smart device and stored in a personal health environment (in Dutch PGO).

P13

Hololearn; Mixed Reality Scenario Based e-learning voor revaliderend werken

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Uit onderzoek is gebleken dat 65% van de patiënten volledig zelfstandig kan bewegen tijdens opname in het ziekenhuis. Desondanks brengen patiënten 90% van de tijd liggend en zittend door, waardoor functieverlies zoals achteruitgang in mobiliteit en ADL op de loer ligt. Zorgverleners hebben de neiging om zorg uit handen te nemen waardoor dit deels in stand wordt gehouden.
Hololearn is een mixed-reality scenario-based trainingsmodule over function-focused care die ontwikkeld is voor verpleegkundigen. Bij deze module wordt, naast een e-learning op de computer, gebruik gemaakt van een module op een hololens. Het doel van de module is om verpleging alert te maken op het belang van bewegen bij in het ziekenhuis opgenomen patiënten en hen de daarvoor benodigde vaardigheden aan te leren. Het typerende van Hololearn is dat deze vaardigheden met behulp van vooraf geprogrammeerde scenario's aangeleerd worden binnen de dagelijkse verpleegkundige handelingen zoals de ADL of een patiënt klaarmaken voor een onderzoek.
Aan de hand van semi-gestructureerde interviews met verpleegkundigen en brainstormsessies met de gehele projectgroep zijn leerdoelen, karakters en scenario's geschreven en is middels een iteratief proces de mixed-reality module op de hololens ontwikkeld.
Het doel is om de trainingsmodule aan de onderwijscyclus van verpleegkundigen toe te voegen. Tevens is de wens om middels een onderzoek de ervaring van gebruikers, de meerwaarde van MR en een evaluatie van de leerdoelen in kaart te brengen.

P14

Natural history, Outcome measures and Trial Readiness in LAMA2-related muscular dystrophy and SELENON-related myopathy in children and adults: protocol of the LAST STRONG study.

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SELENON (SEPN1)-related myopathy (SELENON-RM) is a rare congenital myopathy characterized by slowly progressive proximal muscle weakness, early onset rigidity of the spine and respiratory insufficiency. Muscular dystrophy caused by mutations in the LAMA2 gene (LAMA2-related muscular dystrophy, LAMA2-MD) has a similar clinical phenotype, with either a severe, early-onset (complete), or a mild, childhood- or adult-onset (partial laminin α2 deficiency). For both muscle diseases, no curative treatment options exist, yet promising preclinical studies are ongoing. Currently, there is a paucity on natural history data. Appropriate outcome measures are needed to reach trial readiness.
LAST STRONG is a natural history study in Dutch-speaking patients of all ages diagnosed with SELENON-RM or LAMA2-MD. Patients have four visits at our hospital over a period of 1.5 year. They will undergo a standardized neurological examination, hand-held dynamometry, functional measurements (motor function, balance, graded and timed function tests), questionnaires (Quality of Life, pain, fatigue, participation), muscle ultrasound including diaphragm, pulmonary function tests, cardiac evaluation, spine X-ray , dual-energy X-ray absorptiometry (DEXA-)scan, full body magnetic resonance imaging (MRI) and accelerometry, all adapted to the patient's age and functional abilities.
Our study will describe the natural history of patients diagnosed with SELENON-RM or LAMA2-MD, enabling us to select relevant clinical and functional outcome measures for reaching clinical trial-readiness. Moreover, our detailed description of the clinical features will optimize clinical management and will establish a well-characterized baseline cohort for prospective follow-up.

This study has been approved by Medical ethics committee Arnhem-Nijmegen (NL64269.091.17, 2017-3911) and is registered at ClinicalTrial.gov (NCT04478981).

P15

PERRIN Next Step: Better Together from Knowledge to Active practice

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Topic: In the research program PERRIN, children, adolescents and young adults with cerebral palsy (CP) have been followed longitudinally (0-35 years of age), focusing on the development of activities and participation. The research program has provided knowledge on developmental trajectories and determinants of activities and participation of children and youth with CP. The goal of PERRIN Next Step is to translate this knowledge into high quality tools enabling people to actively use the knowledge in daily life and clinical practice and facilitate Shared Decision Making (SDM).

Relevance:The longitudinal information about CP is unique. The tools and website that are being developed will be a reliable source for information for young people with CP, parents and healthcare professionals. The tools will be easy to use and can be customized to personal needs of the user and facilitate SDM.

Current status: Materials and tools are being developed in an iterative co-creation process with persons with CP, parents, healthcare professionals and researchers, with support of experts in visual and interaction design. A website is being developed facilitating personalized information including (printable) developmental curves for various developmental domains, background information, infographics and experience stories.

Plan of action: The co-creation process that has been initiated will include an advisory group consisting of persons with CP, parents and professional associations. They will provide feedback and advise in use of the tools for the people they represent. In 2022 the website will be launched.

P16

Optimizing the provision process of dynamic arm supports and robotic arms: development of an optimized procedure for the provision

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic: Provision process of dynamic arm supports and robotic arms

Relevance: Impaired upper extremity function due to muscle paresis or paralysis for example as a result of a (neuro)muscular disorder, has a major impact on independent living and QoL. Assistive technology (AT) for upper extremity function (i.e. dynamic arm supports and robotic arms) can increase independence. Previous studies revealed that patients often use these ATs not to their full potential, due to suboptimal provision.

Current status: A protocol describing the optimized provision process was developed in 6 interdisciplinary co-creation sessions (January 2020-March 2021). It was based on a generic Dutch guideline, consisting of 7 steps from “identifying of problem” to “evaluation”. This process resulted in an overview of barriers to solve including limited information about this type of AT, lack of skills in matching patient and AT, insufficient resources for training and support and the absence of structural evaluation. Solutions included vocational education of occupational therapists, allowing to change the AT in case it is not effective after careful consideration and training. Tools were developed supporting patients and professionals, including: instruments to match patients and AT, and digital information regarding ATs.

Plan of action: The protocol was implemented in June 2021 and subsequently we evaluate its cost-effectiveness. We aim to include 48 patients who receive care according to this protocol (intervention group). Effect is assessed by questionnaires relating to QoL and satisfaction. Outcomes are compared to collected data in 2019-2021 in a control group before the implementation of this protocol.

P18

Exploring acquired childhood aphasia; a Dutch registry

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Introduction: Acquired childhood aphasia (ACA), a language deficit due to brain damage, has severe consequences for development. As large observational studies and RCTs are lacking, little is known on the nature of the deficits, language recovery and the effect of speech and language treatment (SLT). To improve care for children with ACA, longitudinal data are necessary. We constructed a Dutch registry on ACA and will present results of the first six months.
Objective: more insight in ACA, patterns of recovery and the effect of SLT.
Patients: children aged 2-18 years with ACA due to brain damage.
Methods: a prospective, longitudinal, multicenter, observational study with a five-year follow-up and online data collection with Gemstracker®. Via a Delphi-procedure core outcome sets of language tests in four age categories were determined.
Results: 18 children were included (2-17 years). The main causes for ACA were stroke (39%) and traumatic brain injury (39%). Severe language deficits were found in 35% of the children. A third had severe word-finding difficulties. After six months, speaking had improved in 38% of the children, but in none of them language fully recovered. Language disorders remained unchanged in 50% of the children.
Discussion and conclusion: the registry provides clinically relevant and valuable insights in ACA. Despite having received SLT, language only improved in a small number of children. Larger studies with a longer follow-up, as this national database, are needed to investigate these findings in the long term.
Message: Join this Dutch registry to better understand and treat ACA!

P19

An innovative intervention to cope with and self-manage long-term consequences of cerebral palsy at adult age

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Introduction&objective: Study the effects of a group intervention on coping skills and self-management of frequent health complaints pain and fatigue in adults with cerebral palsy (CP).

Patients&methods: Twenty-nine adults ≥25y with CP, IQ>70; experiencing pain or fatigue, with care needs on coping/managing chronic complaints participated in 10 weekly group meetings and a follow-up session led by a psychologist to learn coping strategies and self-managing skills through education, action plans and psychotherapy. Assessments: prior to intervention (t0), after finishing (t1) and at 3 (t2) and 9 months (t3) follow-up. Coping and self-managing skills were measured with the Utrecht Proactive Coping Competence scale (UPCC), Social Problem-Solving Inventory-Revised (SPSI-R:S), Pain Coping and Cognition List (PCCL);Pain and fatigue (average and maximum) on Numeric Rating Scale (NRS), Pain Disability Index (PDI) and Fatigue Severity Scale (FSS). Data were analysed using Generalized Estimated Equations with overall time effects ($p<0.05$), and estimated mean difference (MD).

Results: Participants were 45.7±12.4y old; 17 females; GMFCS-level: I (n=5), II (n=13), III (n=7), IV and V (n=2). Pain coping improved (PCCL $p<0.00$; MD at t3= -0.29); coping and self-managing skills did not change ($p=0.28$; $p=0.27$). Pain did not change on PDI ($p=0.84$), average and maximum pain ($p=0.39$; $p=0.70$). Fatigue reduced on FSS ($p=0.02$) and maximum fatigue ($p=0.04$; MD at t3=-0.73), but not on average fatigue ($p=0.55$).

Conclusions: After following a group intervention on coping and self-managing health issues, adults with CP indicated improved pain coping skills and decreased severity and intensity of fatigue. Therefore, consider this intervention in adults with CP.

P20

Determining the smallest detectable change in wheelchair ergometer outcomes during propulsion wheelchair tests

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Introduction
The wheelchair ergometer (Lode Esseda) can be used to monitor propulsion variables of wheelchair users, for example to evaluate wheelchair adaptations. In order to interpret the outcomes of the measurements and to support clinical decision making, it is important to distinguish real changes in propulsion technique and physiological outcomes from measurement errors.

Objective
To determine the smallest detectable change (SDC) of the measured physiological and propulsion technique outcomes.

Subjects
19 able-bodied participants (9 male; age: 23±2,4 years, weight: 73±12,7 kg, length: 175±9,3 cm).

Methods
Participants provided four trials on the wheelchair ergometer. Two hand rim types (conventional aluminum and Gekko (CarboLife)) were tested in random order twice. Each trial consisted of a 30 seconds sprint and a four-minute submaximal duration test at 7 km/h with resistance based on body weight. The ICC, SEM, SDC were calculated for 2 physiological and 11 propulsion technique outcomes.

Results
Test-retest reliability is good to excellent and measurement error showed acceptable SDC-values (ICC=.78-.97; SDC=12.9-21.7%), except for asymmetry and gross mechanical efficiency.

Discussion and conclusions
The ICC, SEM and SDC can be further improved by using experienced wheelchair users, since unexperienced able-bodied participants are less consistent in their technique. Also, the SEM and SDC will further improve by performing repeated trials and taking the average over these trials.

Clinical message
With these results, we are able to interpret the wheelchair ergometer data and define real changes from measurement errors due to wheelchair adaptations or interventions.

P21

Limitations in activities and participation experienced by individuals with chronic inflammatory demyelinating polyneuropathy and multifocal motor neuropathy

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Introduction: Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) and Multifocal Motor Neuropathy (MMN) are rare immune-mediated peripheral neuropathies often causing muscle weakness which may lead to limitations in daily life.
Objective: To evaluate the self-reported limitations in activities and participation of individuals with CIDP or MMN and associated factors.
Patients: 405 adults diagnosed with CIDP (n=257) and MMN (n=148) who visited the department of Neurology at the UMC Utrecht from January 2017 till March 2021 were invited.
Methods: Cross-sectional survey study had been performed in April 2021. The survey included the Rasch-built Overall Disability Scale (CIDP and MMN versions) and the Utrecht Scale for Evaluation of Rehabilitation – Participation as well as questions addressing personal and disease related factors. Multivariate linear regression analysis was used to determine the association with disease related and personal factors.
Results: 196 patients participated (response 49%, 116 CIDP, 80 MMN). Large variation in limitations in activities and participation was found in individuals with CIDP, while individuals with MMN experiences less limitations. Disease severity, pain, fatigue and resilience were independently associated with activity and participation levels in CIDP. Multivariate linear regression for MMN could not been performed since assumptions were not met.
Discussion and conclusions: A large proportion individuals with CIDP and a smaller number with MMN experience limitations in daily life. Pain, fatigue and resilience significantly contribute to perceived limitations in individuals with CIDP which are potentially amenable to multidisciplinary rehabilitation treatment.
Clinical message: An interdisciplinary rehabilitation approach for individuals with CIDP and MMN should be considered.

P22

Walking with a resistance force applied to the trunk can stimulate propulsion after stroke

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Introduction
A decreased propulsive capacity post stroke is associated with a diminished walking ability. Therefore, improving propulsion should be an important focus in rehabilitation post stroke. When walking with a resistance force (RF) applied to the trunk, more propulsion is required to enable forward progression. This may stimulate propulsion after stroke. Before a RF can be used in training settings, the precise effects on propulsion mechanics and related muscles activation need to be assessed and compared between stroke patients and healthy individuals.

Objective
To determine the effects of a RF during walking on propulsive impulse and muscle activity related to propulsion in stroke patients and controls.

Patients
Seven hemiplegic chronic stroke patients and nine able-bodied age-matched controls.

Methods
Participants walked on a treadmill at 0.56m/s with and without a RF of 10% of their body weight applied to their trunk. The propulsive impulse and muscle activity of Biceps Femoris, Rectus Femoris, Medial Gastrocnemius and Soleus were recorded during walking.

Results
When a RF was applied, propulsive impulse and muscle activation amplitude of Biceps Femoris and Rectus Femoris during single stance increased. Effects of walking with a RF were similar between stroke patients and controls.

Discussion and conclusion
The results show walking with a RF increases propulsion. The upper leg muscles are specifically targeted in this intervention.

Clinical message
Walking with a RF increases propulsion and thigh muscle activity related to propulsion. The provision of a RF during treadmill walking may stimulate propulsive capacity after stroke.

P23

Physical recovery up to 12 months after hospitalization for COVID-19; results from the multicenter prospective CO-FLOW study

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Introduction: Long-term physical consequences and recovery patterns in COVID-19 patients who survived hospitalization are unknown.

Objective: To evaluate the trajectory of physical recovery of COVID-19 survivors up to 12 months post-hospital discharge.

Patients: COVID-19 survivors (age ≥18 years) discharged from hospitals in the Netherlands.

Methods: At 3, 6, and 12 months post-discharge, patients performed the 6-minute walking test and 1-minute sit-to-stand test for aerobic capacity. We used linear mixed model analyses, data are presented as estimated mean±standard error.

Results: We assessed 445 patients: mean age 59.7±11.7 years, 295 (66.3%) males, mean body mass index 29.3±5.4 kg/m2, 161 (42.4%) required intensive care, and mean hospital stay 18.8±19.2 days. Hundred patients (27.1%) received inpatient rehabilitation, mean stay 30.2±18.5 days. Overall, the 6-minute walking distance significantly improved from 3 months (474.8±6.4m) to 6 months (494.7±6.9m) and to 12 months (509.1±7.5m) post-discharge ($p<0.001$). A total of 19.1%, 20.4%, and 14.3% of patients walked a distance below the lower limit of normal at 3, 6, and 12 months, respectively. Over all measurements, the distance walked after inpatient rehabilitation was significantly shorter than without inpatient rehabilitation (difference 41.8±14.3m, $p<0.01$), which did not change over time ($p=0.7$). Outcomes on the 1-minute sit-to-stand test post-rehabilitation significantly increased from 3 months (21.5±1.3) to 12 (27.3±1.5) months, but not in patients without inpatient rehabilitation (26.3±0.7 and 27.3±1.1, respectively).

Conclusion: On average, physical recovery was observed in COVID-19 patients up to 12 months after hospitalization.

Clinical message: COVID-19 patients post-rehabilitation have reduced aerobic capacity, which partly recovers within one year follow-up.

P24

The needs regarding telemedicine of informal caregivers of stroke patients during rehabilitation: A qualitative study.

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Introduction: After stroke, patients regularly need informal care. Telemedicine offers opportunities by improving quality, accessibility and efficiency and can make informal caregivers of stroke patients more in charge of the rehabilitation process. The specific needs regarding individualised telemedicine for them were not clear by start of this study.
Objective: To clarify the needs during rehabilitation of informal caregivers of stroke patients regarding telemedicine.
Patients: Couples of adult, first-ever stroke patients and their (anticipated) informal caregivers were included during or after the physical rehabilitation phase.
Methods: In this qualitative study participants were recruited by healthcare professionals in physical rehabilitation medicine. Informal caregivers completed a questionnaire about demographic data. Subsequently, semi-structured interviews about the required support for informal caregivers in a few areas were recorded and transcripted. Deductive and inductive codes were used by descriptive analysis.
Results: Four middle-aged couples were included. All informal caregivers were partner of a stroke patient. They have several needs, but all want to use telemedicine for information about stroke and for emotional support by healthcare professionals or other informal caregivers. The post-rehabilitation phase including daytime activities was a frequently mentioned topic.
Discussion and conclusions: Informal caregivers of stroke patients have several needs during rehabilitation regarding telemedicine, also in the post-rehabilitation phase. Unfortunately, only a small number of patients and informal caregivers were included. Data saturation was not achieved. Future study with focus group discussion is recommended.
Clinical message: Informal caregivers of stroke patients do have several needs regarding telemedicine during rehabilitation and during the post-rehabilitation phase.

P25

Changes in fear of movement in patients attending cardiac rehabilitation: responsiveness of the TSK-NL Heart

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Introduction: Fear of movement (kinesiophobia) is related to low physical activity in cardiac patients and therefore important to target during cardiac rehabilitation (CR).

Objectives: 1] Determine the responsiveness of the Tampa Scale for Kinesiophobia in cardiac patients (TSK-NL Heart); 2] assess changes in kinesiophobia during CR; 3] determine predictors of high kinesiophobia post-CR.

Patients: 109 patients (61 years; 76% men) that participated in a 6 till 12-week CR program.

Methods: Kinesiophobia was measured pre- and post-CR with the TSK-NL Heart. Responsiveness was estimated with effect sizes (ES), standardized response means (SRM) and by correlating change scores on the TSK-NL Heart with those on the Cardiac Anxiety Questionnaire (CAQ) and the anxiety-scale of the Hospital Anxiety and Depression Scale (HADS-A). Logistic regression analysis was used to determine predictors of high kinesiophobia.

Results: The ES and SRM of the TSK-NL Heart were moderate for patients with improved CAQ and HADS-A scores (ES=0.52; SRM=0.57 and ES=0.54; SRM=0.60, respectively). There was a moderate correlation between the TSK-NL Heart and the CAQ (Rs=0.30, p=0.023) and a small correlation with the HADS-A (Rs=0.21, p=0.107). Prevalence of high kinesiophobia improved from 40.4% pre-CR to 25.7% post-CR (p=0.05). Strongest predictors of high kinesiophobia post-CR were high pre-CR scores on the TSK-NL Heart (OR=9.83, 95%CI:3.52-27.46) and the HADS-A (OR=1.26, 95%CI:1.11-1.42).

Discussion and conclusion: The TSK-NL Heart has moderate responsiveness. During CR, there were reductions in kinesiophobia. Nevertheless, 26% still had high kinesiophobia post-CR.

Clinical message: Kinesiophobia interventions should target patients that enter CR with high kinesiophobia and generic anxiety.

P26

Determining the difference between wheelchair adaptations, i.e. hand rim types, by using propulsion wheelchair tests on a wheelchair ergometer

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Introduction
Wheelchair adaptations are mainly based on expert opinion obtained from observation. To advice clinicians involved in adapting a wheelchair, this study aims to evaluate wheelchair adaptations, i.e. hand rim type, by measuring propulsion technique with a wheelchair ergometer (Lode Esseda).

Objective
To determine if differences in wheelchair adaptations, i.e. hand rim types, on physiological and propulsion technique outcomes can be detected by performing tests on a wheelchair ergometer.

Subjects
19 able-bodied participants (9 male; age: 23±2,4 years, weight: 73±12,7 kg, length: 175±9,3 cm).

Methods
Two hand rim types (conventional aluminum and Gekko (CarboLife)) were tested on the wheelchair ergometer twice. Each trial consisted of a 30-seconds sprint and a four-minute submaximal test at 7 km/h with resistance based on body weight. Wilcoxon Signed-Rank test was used to determine the differences in physiological and propulsion technique outcomes between the two hand rim types using the mean ($p<.05$).

Results
Six out of seven propulsion technique outcomes during 30-seconds sprint differ significantly in favor of the more ergonomic Gekko hand rim ($p\leq.02$). No significant differences were found between the hand rim types during the four-minute submaximal test ($p=.32$).

Discussion and conclusions
Differences between wheelchair adaptations can be captured by using a 30-seconds sprint on a wheelchair ergometer. Submaximal duration tests seem to be less suitable to assess differences between wheelchair adaptations, but results may be influenced due to unexperienced wheelchair participants.

Clinical message
A wheelchair ergometer can provide objective data to support clinicians in clinical decision making about wheelchair adaptations.

P27

Patients' and caregivers' preferences regarding a rehabilitation program aimed at fatigue after aneurysmal subarachnoid haemorrhage

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Introduction
Although fatigue in patients after aneurysmal subarachnoid haemorrhage (A-SAH) is a common problem, there are no rehabilitation programs available to reduce fatigue in this population. To increase the willingness to participate and therapy adherence, it is essential to take patients' preferences into account when developing such a program and relate these to caregivers' preferences.

Objective
To map patients' and caregivers' preferences with regard to a rehabilitation program aimed at fatigue after A-SAH.

Patients
Patients with A-SAH who suffer from fatigue and caregivers who work with patients with A-SAH in specialized rehabilitation care.

Methods
Semi-structured interviews comprising questions about preferences in location, frequency and treatment content were conducted in patients. Interviews were analysed using the Framework method. Caregivers were interviewed (non-structured) about current care.

Results
Interviews in ten patients (5 men, 50%) and ten caregivers were analysed. Average time post A-SAH onset was 10.9 months (SD=1.1) and mean age of the patients was 48.9 (SD=15.0) years. The majority of patients preferred physical activity over sessions with the psychologist and/or occupational therapist. Practical feasibility regarding frequency (not too high) and location (close to home) was important. Caregivers emphasized the importance of psychoeducation, support with day/week planning and focus on pre-existent movement behaviour.

Discussion and conclusions
Patients preferred focus on physical activity, whereas caregivers emphasized the importance of psychoeducation and support with planning.

Clinical message
For optimal therapy adherence a rehabilitation program aimed at fatigue after A-SAH should contain physical activity training and focus on pre-existent movement behaviour, psychoeducation and feasibility.

P28

Inertial measurement unit instrumented tests to evaluate gait during stroke rehabilitation: test-retest reliability

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Introduction
Gait is often impaired after stroke, restricting personal independence and affecting quality of life. Gait quality is not systematically measured during clinical rehabilitation, while research indicates that it provides additional information compared to existing clinical assessments. Inertial measurement units (IMUs) have the potential to assess gait quality in clinical practice. Therefore, IMUs might be suitable to evaluate gait during rehabilitation.

Objective
We examined the test-retest reliability of IMU derived gait features during a two-minutes walking assessment in sub-acute stroke patients during clinical rehabilitation.

Patients
Subjects were recruited in two rehabilitation-centers and eligible if diagnosed with stroke, capable of understanding and performing simple tasks and able to walk at least seven meters in two minutes.

Methods
24 Sub-acute stroke patients performed a two-minutes walking assessment, on a 14-meter parkours, twice within 24 hours. Subjects were equipped with three IMUs, at the left foot, right foot and low back. 184 gait features were computed, consisting of spatiotemporal (75), frequency (26), complexity (63) and symmetry (20) features. The test-retest reliability was calculated using the interclass correlation coefficient (ICC 2.1).

Results
73 spatiotemporal, 7 frequency, 49 complexity, and 14 symmetry features were measured with good-excellent reliability (ICC 0.75-1).

Discussion and conclusions
Gait quality can reliably be assessed from a two-minutes walking assessment in sub-acute stroke survivors during clinical rehabilitation.

Clinical message
Assessing gait using IMUs is feasible and reliable and may provide health professionals with additional insight into the walking ability of sub-acute stroke patients.

P29

Effective bowel management in Spinal Cord Injury during inpatient rehabilitation: Data from the Dutch Spinal Cord Injury Database

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Introduction Neurogenic bowel dysfunction (NBD) is one of the most important impairments in spinal cord injury (SCI) with a huge negative impact on quality of life.

Objective To describe bowel management in patients with SCI at admittance and discharge from first inpatient rehabilitation, and to determine predictive factors for achieving effective bowel management (EBM) at discharge.

Patients People with recently acquired SCI were included when admitted for their first inpatient rehabilitation to a specialized rehabilitation center in the Netherlands.

Methods Data from the Dutch Spinal Cord Injury Database (NDD) collected between 2015 and 2019 was used. A stool frequency >2 times a week to ≤ 2 times a day and fecal incontinence <1 a month, was defined as an EBM.

Results Of 1210 people, at admittance 818 patients (67.6%) had no EBM. Of them, 308 patients (37.7%) remained no EBM at discharge (in total 33.1% of all patients). A multivariate logistic regression analysis shows that patients with AIS-A (p=0.01) and non-traumatic etiology (p=0.02) are associated with higher odds ratio for no EBM at discharge.

Discussion and conclusions During first inpatient rehabilitation after SCI, regulating NBD is a major challenge. AIS-A and non-traumatic SCI are associated with higher odds ratio for no EBM at discharge.

Clinical message Bowel management after SCI should be monitored closely during first inpatient rehabilitation, especially in people with AIS A and non-traumatic SCI.

P30

The effects of an interdisciplinary rehabilitation program in patients following covid-19 infection: an observational study in an outpatient setting

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Introduction
Patients following COVID-19 infection can suffer from various degrees of impairments in respiratory, physical and psychological function. Moreover, a large sample of patients experience multiple symptoms months after the onset of the infection. Persistent symptoms have a major impact on health-related quality of life, performing activities of daily living, and participation in society. Therefore, an interdisciplinary approach to COVID-19 rehabilitation interventions seems necessary.

Objective
The objective was to explore the effects of an interdisciplinary, outpatient rehabilitation program in patients with complex symptoms and impairments in activities and participation following COVID-19 infection.

Patients
55 patients who completed the rehabilitation program provided informed consent. Data from 45 patients were included and analyzed.

Methods
A single-arm pragmatic observational study was initiated to explore the effects of interdisciplinary rehabilitation on health-related quality of life, anxiety, depression, and physical functioning including exercise capacity, muscle strength, and fatigue.

Results
Significant improvements were found for health-related quality of life regarding physical functioning, role limitations due to physical health, body pain, vitality, social functioning, and mental health. The other subscales showed no significant changes. Anxiety, depression, and physical functioning improved significantly.

Conclusions and clinical message
This study showed promising results regarding the effect of an interdisciplinary outpatient rehabilitation program in patients following COVID-19 infection. Nevertheless, these results need to be confirmed by a multicenter randomized controlled trial.

P31

Cognitive functioning, fatigue, and psychological outcomes up to 12 months after hospitalization for COVID-19

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Introduction: Patients with coronavirus disease (COVID-19) may experience long COVID, referring to persistent fatigue, but also to other lingering cognitive and psychological symptoms.

Objective: To evaluate the trajectories of these cognitive and psychological outcomes, and to assess the role of fatigue in long COVID.

Patients: COVID-19 survivors discharged from hospitals in the mid-west of the Netherlands.

Methods: We evaluated patients at 3, 6, and 12 months post-hospitalization with Montreal Cognitive Assessment (MoCA), Hospital Anxiety and Depression Scale (HADS), Impact of Event Scale-Revised (IES-R), and Fatigue Assessment Scale (FAS). We used linear mixed models for analyses.

Results: We have current data of 386 patients; 121 (32.4%) women, mean age 59.8±12.0 years, mean hospital stay 17.6±19.3 days, and 39.6% treated in intensive care unit. Mild cognitive impairment (MoCA<26) was present in 44.8%, 36.8%, and 31.6% of the patients at 3, 6, and 12 months, respectively. Anxiety (HADS-A≥8) was reported by 34.9%, 28.9%, and 22.0% of the patients; depression (HADS-D≥8) by 25.4, 24.7%, and 17.6%; post-traumatic stress (PTSS) (IES-R>33) by 12.7%, 10.8%, and 5.5%; and fatigue (FAS>22) by 57.1%, 55.1%, and 54.9% at 3, 6, and 12 months, respectively. All outcomes improved significantly over time ($p<0.005$). Fatigue was strongly associated with anxiety ($p<0.001$), depression ($p<0.001$), and PTSS ($p<0.001$), but not with cognitive functioning ($p=0.727$).

Conclusion: Up to one year post-hospitalization, many COVID-19 patients reported significant fatigue, cognitive and psychological problems. Recovery was observed over time, although fatigue persisted in the majority.

Clinical message: Fatigue seems to play a pivotal role in long COVID.

P32

Augmented rehab: using mixed reality in spinal cord injury rehabilitation – a pilot study

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Introduction

An active lifestyle is important for persons living with spinal cord injury, but challenging to achieve. Effective counselling about the consequences of the injury to their bodies is essential for long-term health. Conventional education methods, however, have barriers. In co-creation with patients, rehabilitation professionals and a software developer, we developed two Mixed Reality (MR) physical exercise games and an interactive MR patient education intervention explaining the consequences of a spinal cord injury. We hypothesized that MR games can promote physical activity, and that MR patient education can strengthen knowledge transfers.

Patients and methods

Twenty-five inpatients were enabled to use the MR apps for 2 weeks. During a 3 week pre-post design regular physical exercise was compared with MR physical exercise (on top of planned therapy). Motivation, usability of the apps, and subjective experience were evaluated using questionnaires and interviews.

Results and discussion

Seventeen patients completed the study, two discontinued due to usability problems. Feedback about the experience and usability was widely distributed, varying from “physically challenging” and “entertaining” to “difficult controls” and “too easy”. The clear visual explanation of the MR patient education was positively received. The MR games were not used much as physical exercise, possibly due to technical, practical barriers and time-consuming questionnaires.

Conclusions and clinical implications

MR games can be used for some patients as a method of leisure or exercise, and MR can improve patient education. Technical difficulties were perceived as barriers. The implementation in our spinal cord injury rehabilitation program will further be evaluated.

P33

The effect of AFO-tuning on gait in children with cerebral palsy

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Introduction: Ankle foot orthoses (AFOs) are frequently prescribed in children with cerebral palsy (CP) to improve kinematics and to align the ground reaction force (GRF) during gait. Modifying the external design of the AFO-shoe-combination (AFO-SC) to optimize gait parameters is defined as 'tuning'.

Objective: To investigate the effect of adding wedges to a child's prescribed AFO-SC on knee angle, shank-to-vertical-angle (SVA) and GRF.

Patients: 29 children with CP (7.8±3.5yr; GMFCSI-II) with a knee hyperextension (n=12) or excessive knee flexion gait pattern (n=17).

Methods: 2D video gait analyses were performed according to a standardized clinical AFO-tuning protocol under 4 conditions: AFO-SC alone, and with incrementing wedge height (0.5;1.0;1.5cm). Sagittal knee angle, SVA and position of GRF relative to the knee joint center were determined manually using MoxieViewer software. Two-way repeated measures ANOVAs or Friedman tests were performed to assess the effect of wedge height.

Results: With increasing wedge height the knee angle at midstance increased (p=0.044), whereas it decreased at opposite initial contact (OIC) (p=0.005), with a trend towards increasing SVA at midstance (p=0.055). Incrementing wedge height shifted the position of the GRF more posterior to the knee (p=0.042).

Discussion and conclusions: AFO tuning using wedges influences the knee angle in midstance and OIC and the position of the GRF in midstance. This could positively affect gait in children with CP, especially at midstance in a knee hyperextension pattern.

Clinical message: AFO tuning by adding wedges can be used to optimize knee angle and GRF during gait in children with CP.

P34

Effectiveness of Innovative Interventions for Cognitive Rehabilitation in Children with ABI, in Conjunction with a Serious Game

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Review:

Cognitive impairment is highly prevalent in children following Acquired Brain Injury (ABI), evident across multiple cognitive domains including attention, executive function, and memory. This may negatively impact activities and participation, such a returning to school and play. Advanced technology, such as Virtual Reality (VR), is gaining increased attention, particularly in conjunction with a Serious Game.

The overarching aim of this review is, therefore, to comprehensively evaluate the effectiveness of innovative interventions for cognitive rehabilitation in children with ABI, in conjunction with a serious game.

Innovative intervention studies for cognitive rehabilitation in children with ABI were identified on PsycINFO, PubMed and Scopus, using relevant keywords appropriate to each resource. Searches were initially conducted on 23 December 2020 and updated 26 April 2021. Restrictions were applied on language (English), year (>1999 - 2021) and age (0-18y). No restrictions were applied to publication status.

The authors included 11 studies; six were RCTs and five were non-RCTs. The following study characteristics were extracted: study characteristics, intervention characteristics and patient characteristics.

Of these, 10 studies represented Computer-Based Cognitive Retraining (CBCR) and one study represented VR. CBCR demonstrated significant improvements in memory, processing speed and select measures of executive function. However, mixed results were reported for attention and academic performance. VR appeared effective for improving attentional and executive processes.

CBCR and VR are considered promising novel approaches for cognitive training in children with ABI. Studies evaluating CBCR and VR should be considered preliminary due to risk of bias and limited number, respectively.

P35

Changes in bladder management during first inpatient rehabilitation after spinal cord injury and determining factors: Data from the Dutch Spinal Cord Injury Database

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Introduction
Bladder management in spinal cord injury (SCI) patients during first inpatient rehabilitation aims to reduce complications, accomplish safe and efficient urine storage, and guard the patient's independence.

Objective
To describe the methods of bladder management at admission and discharge in patients with recently acquired SCI and to evaluate factors associated with each method at discharge from the rehabilitation centre.

Patients
SCI patients admitted for first inpatient rehabilitation to a specialized centre in the Netherlands between 2015 and 2019.

Methods
Multicentre prospective observational study, using data from the Dutch Spinal Cord Injury Database.

Results
1403 patients were included. The level of SCI was cervical in 44%, thoracic in 38% and lumbosacral in 18%. AIS scale was A (12%), B (9%), C (15%) and D (64%). The method of bladder management at discharge changed significantly compared to admission ($p<.001$): from assisted intermittent catheterization (17.1% to 4.1%) and indwelling catheter (33.4% to 16.3%) at admission to clean intermittent self-catheterization (7.8% to 22.2%) and normal voiding (40.2% to 56.1%) at discharge. Age, gender, SCI level, AIS classification and SCIM score were related to the method of bladder management at discharge (all $p<.001$).
At discharge, 13% of the patients had urinary incontinence of which 37% used incontinence pads, 34% condom catheters and 27% did not use containment materials.

Discussion and conclusion
The observed transition in bladder management in SCI patients during first inpatient rehabilitation is in line with current guidelines.

Clinical message
The method of bladder management at discharge changed significantly compared to admission.

P36

Martial arts training for boys with Duchenne Muscular Dystrophy

A feasibility study

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Introduction: Multiple studies show the positive effects of martial arts on physical and psychosocial wellbeing. We think that a physical and psychosocial training program, based on martial arts, can also have positive effects for boys with Duchenne Muscular Dystrophy (DMD).

Objective: The primary aim of this pilot study was to investigate the safety and feasibility of a 3-month martial arts based training (MAT) program for DMD patients. The secondary objective was to examine changes in physical and psychosocial activities after participating in the MAT-program.

Patients: Twelve DMD patients (10 ambulant, 2 non-ambulant) were included after ethical approval was received and they signed informed consent.

Methods: The MAT program was found feasible and safe when the individual adherence rate was > 75% and no injuries or adverse effects occurred. Changes in physical activities were measured using the MFM, PUL and NSAA. Changes in psychosocial abilities were measured using the SDQ, PARS III and SPCC/SPPA.

Results: 2 participants did not complete the MAT program. Attendance rate for the 10 remaining participants was 91%. 11 falls were reported during the training, but these falls did not result in injuries. After completing the MAT program, most participants showed an improvement of their psychosocial abilities and their physical abilities did not show deterioration.

Conclusion/ discussion: The MAT-program is feasible and safe for boys with DMD, and there is a trend towards psychosocial improvement after the MAT-program. Future studies should focus on evaluating the effectiveness of the MAT program in a larger population.

P37

An innovative care pathway for botulinum toxin treatment

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Subject & Relevance:
Administration of botulinum toxin is widely used as a spasticity treatment.
In practice, a botulinum toxin treatment usually does not proceed uniformly, whereby the evaluation of the treatment effect takes place with different measuring instruments, at different times, or sometimes even by other practitioners. The aim is to create an unambiguous, effective and cost-efficient indication and evaluation of a botulinum toxin treatment, which can be easily implemented in other centers/hospitals.

Current status:
A care pathway that has been developed from the perspective of the patient, doctor, therapists and managers. The basic principle is that the diagnosis and evaluation of spasticity should be performed if possible, on the same day and by the same professionals. Depending on the treatment goal, uniform and targeted diagnostics are used. These consist of established measuring instruments, supplemented if necessary, with a temporary nerve or muscle block.
After the diagnostic phase, treatment advice is given on the same day. If a botulinum toxin treatment follows, this is evaluated in an unambiguous manner.
This care pathway describes an efficient route of indication and evaluation of a botulinum toxin treatment. For the patient this is organized as least burdensome, for the therapist as efficient and for the institution as most cost-controlled.

Plan of action:
Sharing our care pathway with other centers and hospitals. In our own center we have started with the organization of the policlinics and will plan an evaluation moment after six months.

P38

The course of pain in stroke patients receiving rehabilitation

Drs. Winke van Meijeren-Pont[1,2], MD, PhD Henk Arwert[1,3], MD, PhD Daniella Oosterveer[1,2], prof. Wilco Achterberg[2], prof. Thea Vliet Vlieland[1,2]
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Introduction: About 30-42% of patients were found to report pain in the subacute phase after stroke, but little is known on its course in the chronic phase.
Objective: Describe the course of pain and arm pain up to 30 months after the start of stroke rehabilitation.
Patients: 482 patients participating in the Stroke Cohort Outcomes of REhabilitation (SCORE) study.
Methods: Patients reported the presence (yes/no) of pain in the arm and/or elsewhere in the past week, 3, 18 and 30 months after start of rehabilitation. Pain was defined as pain in the arm and/or elsewhere.
Results: Patients' mean age was 60.7 years (Standard Deviation 11.7) and 345 (60%) were male. Three hundred fifty seven (74%) patients reported pain, of which 260 (73%) patients reported arm pain and at one or more time points. At 3, 18 and 30 months, the proportions of patients reporting pain were 293 (61%), 197 (53%) and 170 (53%), of which 188 (64%), 136 (69%) and 109 (64%) reported arm pain. Of the 189 patients reporting no pain at 3 months 64 (34%) reported pain at either 18 and/or 30 months. Of the 333 patients with pain at 3 and/or 18 months 77 (35%) had no pain at 30 months.
Discussion and conclusions: The majority of stroke patients report pain in the chronic phase after rehabilitation, which subsides in a minority and can arise in the chronic phase.
Clinical message: More attention for diagnosis and treatment of pain in the chronic phase after stroke is needed.

P39

Faecal microbiota in patients with neurogenic bowel dysfunction and spinal cord injury or multiple sclerosis - a systematic review

Drs. Willemijn Faber[1], Dr Janneke Stolwijk - Swuste, Dr Janneke Nachtegaal, Drs Florian van Ginkel, dr Erwin Zoetendal, dr Renate Winkels, prof dr Ben Witteman
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Objective:
A systematic review on microbiota in patients with Spinal Cord Injury and Multiple Sclerosis, and the possible role of neurogenic bowel function, diet and antibiotic use.

Search strategy:
A systematic search was conducted in Pubmed and Embase and methodological quality was assessed.

Selection of artcles:
We excluded articles on children, animals and with no control group. Articles should determine microbiota by 165 rRNA gene sequencing.

Evaluation and results:
We retrieved 14 articles, with a total of 479 patients.
Results of the studies suggested that alpha diversity in chronic SCI patients is lower whereas the alpha diversity of MS patients is similar compared to HC. Taxonomic changes in SCI and MS studies are diverse. Most studies did not account for possible confouding by diet, antibiotic use and bowel function. And furthermore, they only looked at one sample.

Conclusion:
Based on these 14 papers, we cannot draw strong conclusions. Putatively, alpha diversity in chronic SCI patients may be lower while in MS patients alpha diversity may be similar compared to HC.
Clinical consequences are difficult to draw.The lower alpha diversity might lead to bowel problems and NBD. In these patients, supplementing with probiotics or diet adjustments might have a positive effect.
Future studies should collect multiple faecal samples over time. Moreover, accurate collection and reporting of information about dietary intake, antibiotic use, NBD and changes in those factors should be required, together with better reporting on patients' characteristics and clinical metadata to draw rational conclusions and come to possible clinical consequences.

P40

Pain in Spinal Cord Injury During Initial Inpatient Rehabilitation: Data from the Dutch Spinal Cord Injury Database

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Introduction: Pain is a secondary condition which is frequently reported in spinal cord injury (SCI) and has a significant impact on quality of life.
Objective: To identify the prevalence of spinal cord injury (SCI) related pain during inpatient rehabilitation and investigate a possible relation between pain and patient/lesion characteristics.
Patients: SCI patients admitted to inpatient rehabilitation between 2013 and 2019 in the Netherlands.
Methods: Data were collected at admittance and discharge, including demographics and lesion characteristics. Odds ratios were calculated for prevalence of pain related to age, gender, etiology, completeness and level of injury. Odds ratios were adjusted for gender, age, ASIA impairment scale (AIS), etiology and level of injury.
Results: A total of 2700 SCI-patients were included in the analysis. Pain prevalence at admission was 40.2% for nociceptive pain and 30.6% for neuropathic pain. Pain prevalence at discharge was 25.4% for nociceptive pain and 31.5% for neuropathic pain. Having nociceptive pain was significantly related to AIS score, female gender and traumatic injury. Having neuropathic pain was significantly related to female gender, younger age, traumatic injury and tetraplegia.
Discussion and conclusion: SCI-related pain is highly prevalent during inpatient rehabilitation. Female patients and patients suffering from traumatic SCI have an increased risk of having nociceptive pain. Female patients, younger patients, patients suffering from traumatic SCI and tetraplegic patients have an increased risk of having neuropathic pain.
Clinical message: Caregivers should be aware of these differences in screening patients on pain during inpatient rehabilitation.

P41

Information needs and preferences in ALS patients in the Netherlands

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Introduction
Providing adequate information to patients with Amyotrophic Lateral Sclerosis (ALS), Progressive Spinal Muscular Atrophy (PSMA) and Primary Lateral Sclerosis (PLS) and their informal caregivers is pivotal for making informed decisions in their treatment.

Objective
To evaluate the information needs of patients with ALS, PSMA and PLS and their satisfaction with the received information with respect to the content, timing, format of information.

Patients
Patients with ALS, PSMA and PLS registered in the Biobank Neuromuscular Diseases of the UMC Utrecht and the Prospective ALS study Netherlands.

Methods
A digital cross-sectional survey has been sent by e-mail or post to a random sample of patients (N=270). The survey contained questions on content of different websites and other disease-specific information sources, timing and preferred format of information communication.

Results
In total 120 patients (44%) completed the survey. Two-third of the patients (N=79, 66%) uses the internet as source of information. Main source used is https://als-centrum.nl. Information given right after the diagnosis is experienced as confronting but suitable in time. Respondents were generally satisfied with the different sources. Preferences for format of information differed.

Discussion and conclusions
The majority of respondents in general are satisfied with the information provision by the different providers within the ALS care in the Netherlands with respect to content and timing. Patients need customized and adequately timed health information.

Clinical message
Websites are an important source of information, healthcare professionals should allocate resources to provide accurate information that is easy to find.

P42

Real-time assessment of fatigue reveals that fatigue after subarachnoid haemorrhage is not static but varies within and between days

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Introduction: Fatigue is one of the most commonly reported symptoms after subarachnoid haemorrhage (SAH). Fatigue is often assessed retrospectively with a questionnaire, wherein daily variability in fatigue is not reflected. Insight in variability in fatigue within and between days may contribute to optimizing interventions to treat fatigue after SAH.
Objective: To describe daily variability in fatigue after SAH using the ecological momentary assessment (EMA) method.
Patients: Patients with SAH who suffer from fatigue.
Methods: Cross-sectional study. Patients rated their real-time fatigue (scale 1-7) 10-12 times per day for 7 consecutive days using an electronic diary. In addition, fatigue (scale 1-7) was assessed with the Fatigue Severity Scale (FSS). Multilevel mixed-model analyses, including random slopes, were conducted.
Results: Forty-two patients with SAH (43% male) participated in the study. Mean age was 53.9 years (SD=13.0) and mean time post-onset was 9.3 months (SD=3.2). Mean real-time fatigue over all days was 3.22 (SD=1.47) and mean FSS score was 5.02 (SD=1.18). Total variance in fatigue was explained for 52.3% by between-person variance and for 47.7% by within-person variance. Multilevel analyses revealed that fatigue varied significantly ($p<0.001$) within the day. Moreover, this daily variability differed between individuals, and within individuals between days.
Discussion and conclusions: Fatigue after SAH is not static: real-time fatigue varies over the day. In addition, individuals show different fatigue patterns between days.
Clinical message: Daily variability in fatigue as assessed using the EMA method should be taken into account for optimizing personalized interventions to treat fatigue after SAH.

P43

Cardiac rehabilitation for patients with obesity: results of the OPTICARE XL RCT on health-related quality of life, fatigue and participation in society

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Introduction Patients with cardiovascular diseases are referred to cardiac rehabilitation (CR) for secondary prevention. More than a third of the patients suffers from obesity, and this number is growing. These patients do often experience problems with respect to psychosocial well-being and standard CR is known to be suboptimal.
Objective To describe the effectiveness of a new tailor-made CR program, OPTICARE XL, on HRQOL (primary), fatigue and participation in society.
Patients Cardiac patients with obesity.
Methods Patients were randomized to standard CR (n=99) or OPTICARE XL (n=102). Standard CR consists of a 10-week aerobic exercise program, supplemented with cardiovascular lifestyle education. OPTICARE XL is a one-year tailor-made group intervention including aerobic and strength exercise, behavioural coaching and an after-care program. Short-term results were evaluated three months after the start of CR, long-term results six months post CR.
Results On the short-term and long-term, both groups showed significant within-group improvements in HRQOL, fatigue and participation in society. The OPTICARE XL group showed a significantly larger improvement in perceived restrictions with participation in society than the standard CR group on the short-term (USER-P score 83.4 to 90.5 versus 83.4 to 86.6, respectively, p=0.030).
Discussion and conclusions Short-term effects of OPTICARE XL did not sustain on the long-term. Redesign of the after-care program is needed to expand improvements on the assessed outcomes to the long-term.
Clinical message Tailor-made care for cardiac patients with obesity is important. The OPTICARE XL program needs to be redesigned to achieve optimal results with regard to psychosocial well-being.

P44

Recovery of functional mobility and lower limb function during the first 3 months post-stroke in patients with visuospatial neglect: Preliminary results of a longitudinal cohort study

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Introduction
Various studies suggest an association of visuospatial neglect (VSN) with impaired functional mobility (i.e., sitting, standing, transfers), with longer rehabilitation trajectories for VSN patients compared to non-VSN patients. Research mainly focused on upper limb recovery and little is known about functional mobility with respect to the lower limbs.

Objective
To investigate the longitudinal recovery of functional mobility in patients with and without VSN.

Patients
Patients with a first-ever stroke (18-90 years) and leg paresis were included.

Methods
Patients were included either at < 14 days, 3 weeks or 5 weeks and followed-up at 3 weeks, 5 weeks, 8 weeks and 12 weeks post-stroke. VSN was assessed with the Broken Hearts Test, leg paresis with the Motricity Index (MI), and functional mobility with the Rivermead Mobility Index (RMI). A linear mixed model was fitted with RMI score as depended variable, random intercept (patient ID) and random slope (patient ID*baseline MI score), and with fixed effects 'Time', 'Initial VSN' and 'MI score'.

Results
Eighteen VSN patients and 25 non-VSN patients were included. Presence of initial neglect and paresis of the lower limbs, and time post-stroke onset were significant predictors for RMI score.

Discussion and conclusions
Over time, VSN was a significant negative predictor for RMI score, even if the model corrected for leg paresis. VSN patients show lower functional mobility throughout time with a lower recovery potential compared to non-VSN patients.

Clinical message
VSN should be diagnosed and treated early after stroke considering its potential suppressive effect on functional mobility.

P45

A clinical perspective on functional problems in adults with cerebral palsy, with respect to, intellectual and walking disability; preparing an ICF Core Set for adults with CP

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Introduction
Seventy-five percent of the population with CP is at adult age. In order to optimize clinical care and research an ICF Core Set for adults with CP will be developed.

Objective
To identify functional problems in adults with CP in northern Europe, stratified by intellectual disability and walking disability.

Patients
Adults with CP visiting rehabilitation centres in the Netherlands and Sweden.

Methods
Semi-structured interviews were conducted with participants using an adapted version of the ICF checklist 2.1a to assess functional problems and impact of environmental factors, with 106 categories in 21 domains. Frequency of problems were analysed, addressing specific subgroups of patients (intellectual disability, non-walkers), corrected for age.

Results
Sixty participants were included, 30 of each country, mean age 36.36 y (± SD 13.49y), 18.3% with an intellectual disability, 40% functional walkers. At least 75% of the adults indicated problems in 25 categories (of 10 domains): 7 body functions, 1 body structure, 6 activities and participation,11 supportive environmental factors. In addition, subgroups with intellectual disability or non-walkers reported extra problems (22 or 14 categories added), regarding mental functions, mobility-related functions, self-care, education and employment.

Discussion and conclusions
Adults with CP in Europe visiting rehabilitation centres experience a high number and broad variety of functional problems, and a supportive impact of environmental factors.

Clinical message
- Adults with CP in northern Europe experience many and various functional problems.
- They experience environmental factors mostly as facilitating
- In adults with intellectual disability or non-walkers additional ICF categories may need attention.

P46

4PM&R: Stay informed about scientific rehabilitation research

Drs. Wouter Vints[1], Drs. Maurice Sopacua[1], Drs. Zoë van Mechelen[1], Drs. Eva-Maria Lefferts[1], Drs. Audrey Vollebregt[1], Dr. Henk-Jan Prins[1], Drs. Judith Sparidans[1], Dr. Peter Heuts[2], Drs. Rob Riksen[2], Drs. Wip Bakx[1]
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Topic:
Rehabilitation research journals

Relevance:
Nowadays the number of articles published is high and it is hard for rehabilitation physicians, paramedics or researchers to keep up with the increase of medical knowledge and innovations. However, both your colleagues and your patients expect you to be up to date.

Therefore, we propose 4PM&R, which is a spin-off of 4Abstracts and stands for “For Physical Medicine & Rehabilitation”.

4PM&R is a free email service offered by Dutch residents in training and rehabilitation physicians. Readers receive a monthly overview of recently published scientific articles from six leading journals in the field of Physical Medicine and Rehabilitation. The four most striking, instructive or interesting articles per journal are selected. Especially articles with a direct impact on clinical practice are chosen by the editors. Hence, readers can save the time of finding these articles themselves, while enjoying a monthly total of 16 abstracts offering a broad overview of scientific progress in rehabilitation medicine.

Current status:
Since November 2020 everyone can register to this service on the webpage https://www.4abstracts.com/spin-offs/4pm-r or via the general website www.4abstracts.com, after which you choose “Subscribe” to sign up. The ten editors are volunteers, which allows the service to be completely for free and ad-free.

Plan of action:
Our aim is to reach more rehabilitation doctors by increasing national and international knowledge of our initiative. Our initiative appeared in the VRA newsletter and in ‘Nederlands Tijdschrift voor Revalidatiegeneeskunde (NTR)’. It was recently submitted to the Belgian newsletter for physical medicine and rehabilitation.

P47

The longitudinal association between movement behavior patterns and the course of participation in people with stroke up to one year after discharge to the home setting.

Drs. Joris de Graaf[1,2], Dr. Roderick Wondergem[2,3,4], drs. Eline Kooijmans[1,2], dr. Martijn Pisters[2,3,4], dr. Vera Schepers[1,2], Prof. Cindy Veenhof[2,3,5], Prof. dr. Anne Visser-Meily[1,2], Prof. Marcel Post[1,6]

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Introduction: Movement behavior (the composition of time spend sedentary and time spend in light, moderate or vigorous physical activity) is a modifiable factor in stroke rehabilitation, but its association with the course of participation after stroke is currently unknown.
Objective: (1) To investigate the differences in the course of participation up to one year after stroke between distinct movement behavior patterns identified directly after discharge to the home setting, and (2) to investigate the longitudinal association between the development of movement behavior patterns over time and participation after stroke.
Patients: 200 individuals with a first-ever stroke were assessed directly after discharge to the home setting, at six months and at one year.
Methods: The Participation domain of the Stroke Impact Scale 3.0 was used to measure participation. Movement behavior was objectified using accelerometry for 14 days. Participants were categorized into three distinct movement behavior patterns: sedentary exercisers, sedentary movers and sedentary prolongers. Generalized estimating equations (GEE) were performed.
Results: Participation improved up to six months after discharge and stabilized afterwards across all movement behavior patterns. Sedentary prolongers identified directly after discharge were associated with a worse course of participation up to one year after stroke. The development of sedentary prolongers over time was also associated with worse participation compared to sedentary exercisers.
Conclusions and clinical message: The course of participation after stroke differs across distinct movement behavior patterns after discharge to the home setting. Highly sedentary and inactive people with stroke are at risk for restrictions in participation over time.

P48

De Huidige Knelpunten in de Zorg voor Neuromusculaire Aandoeningen in Relatie tot een Netwerk: Een Kwantitatieve Studie

Drs. Ronne Pater[1,2], Dr. Nicole Voet[1,3], Dr. Anita Beelen[4], Drs. Annette van de Geest[4], Drs. Esther Kruitwagen - van Reenen[4], Drs. Saskia Houwen - van Opstal[3]
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Om de zorg voor kinderen en volwassenen met neuromusculaire aandoeningen (NMA) te verbeteren is in 2020 een project gestart om een landelijk multidisciplinair zorgnetwerk te ontwikkelen, beginnend bij de diagnoses FSHD en SMA als pilot-groep.
Het doel van dit onderzoek is: inventariseren van 1) de huidige knelpunten, en 2) de wensen ten aanzien van een netwerk in de zorg voor NMA en 3) het opstellen van mogelijke strategieën ter verbetering.
Het onderzoek is uitgevoerd onder relevante stakeholders (mensen met FSHD, eerste, tweede en derdelijns zorgprofessionals) en reeds bestaande netwerken.
Kwalitatieve data is verzameld via vragenlijsten (n=138), diepte-interviews (n=44) en focusgroepen (n=6).
Hieruit blijkt dat er behoefte is aan meer (behandelaren met) kennis van NMA, samenwerking tussen zorgprofessionals uit verschillende zorglijnen en aan uniforme, holistische en bereikbare zorg.
Mogelijke strategieën zijn het mogelijk maken van patiënt-gerichte-overleggen tussen verschillende lijnen en organisaties, afspraken m.b.t. uniformiteit in zorg en klinimetrie, en gerichte scholing voor zorgprofessionals.
Aanbevelingen bij het vormen van een netwerk zijn: het streven naar structureel implementeren van de mogelijke strategieën in de Nederlandse zorg gecombineerd met een open structuur van het zorgnetwerk, waarbij er vrijheid blijft in het kiezen van zorgverleners.
Vervolgstappen voor het project zijn het uitvragen van de wensen van mensen met SMA en FSHD, het aangaan van samenwerkingen met reeds bestaande netwerken en initiatieven en het starten van projecten om de zorg te verbeteren.
Klinische Relevantie: Het onderzoek geeft duidelijk richting aan het ontwikkelen van een netwerk dat bijdraagt aan verbetering van zorg voor alle mensen met NMA.

P49

Differences in quality of life between Europeans and non-Europeans in a Dutch hospital based stroke population.

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Introduction
In the literature, ethnicity is an independent determinant of outcome after stroke. In Europe, data on this topic is lacking.

Objective
To determine the differences in quality of life (QOL) between European and non-European patients, 2-5 years after stroke in a Dutch hospital population.

Patients
Patients, 18 years and older, hospitalized after an ischemic or hemorrhagic stroke (2008-2010).

Methods
In this retrospective cohort, data was collected from hospital files and by questionnaires regarding stroke characteristics, sociodemographic characteristics and QOL 2-5 years poststroke. QOL was measured by the EQ-5D (EuroQol-5D) and SF-36 (Short Form; psychical and mental component scores, PCS and MCS respectively). These outcomes were compared between Europeans (born in Europe) and non-Europeans (born elsewhere) by linear regression analysis, corrected for age, sex, stroke severity (Barthel Index on admission) and educational level.

Results
The study included 207 patients (mean age 63.1 years, SD14.4; 125M/82F; Barthel 13.3, SD6.5; education high/medium/low 55/77/77), 169 European, 38 non-European (14 Indonesia, 9 Suriname, 5 Antilles, 10 others). PCS was higher in the Europeans compared to the non-Europeans (42.9, SD13.3 vs 35.4, SD13.1; p=0.003). Likewise, Europeans had better EQ5D outcomes than non-Europeans (.762, SD.221 vs .599, SD.336; p<.001). The MCS was not significantly different between the two groups.

Discussion and conclusions
In stroke survivors, Europeans have better long-term outcomes regarding QOL than non-Europeans, corrected for age, sex, stroke severity and educational level.

Clinical message
Poststroke care programs probably has to take ethnicity into account as a relevant determinant for the outcome after stroke.

P50

Measuring of trans-tibial residual limb volume.

Drs. Z Grootkarzijn[1], Drs. R.E. Winter, Dr. E.C.T. Baars
[1]*Vogellanden*

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Introduction: Over the past years, different methods for measuring residual limb volume have been developed and studied. Contemporary scanners in measuring are an iPad combined with a structure sensor or the M4D scan. Benefit of both systems is they are easily available and simply to use. However, no literature is available showing reliability of these non-contact scanners.

Objective: The purpose of this study is to assess reliability, concurrent validity and usability of two non-contact scanners (M4D scan and iPad combined with a structure sensor).

Patients: This study uses six different scale models, divided in three bulky and three coniform trans-tibial residual limb models.

Methods: This study is a repeated measures experimental design. Six different scale models were measured on two different occasions, each consisting of two sessions. Per session all observers measured the six scale models with two different systems. The volume of the model was measured from mid-patellar tendon point to distal end of the model. User satisfaction was evaluated with the Post-Study System Usability Questionnaire.

Results: Data was collected in April and May of 2021. The data is currently being analysed. The analysis is expected to be completed in July.

Discussion and conclusions: Not yet available.

Clinical message: Not yet available.

P51

The use of the Withings Pulse HR smartwatch in a cardiac rehabilitation program

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Topic
Basalt performed a pilot study to explore the feasibility of using the Withings Pulse HR smartwatch (WP) in patients with heart failure (HF) attending a cardiac rehabilitation program. The WP was used as an objective measurement to guide training intensity during exercise training at home.

Relevance
Guidelines advise HF patients to participate in cardiac rehabilitation to improve exercise capacity and quality of life. To guide training intensity during rehabilitation, exercise prescription can be based on the subjective Borg Scale of Perceived Exertion or heart rate frequency. This study evaluated the WP as an objective method to guide the home-based exercise program.

Current status
Patients received the WP when attending the exercise program. The accompanying app was installed on their telephone. Personalised heart rate-based training zones were provided. The WP measured, recorded and analysed heart rate frequency during home-based exercise. To evaluate the user-friendliness of the WP, questionnaires and structured interviews were held. Data on heart rate frequency was evaluated to determine adherence to predetermined exercising training goals.
Results demonstrated that the WP positively affected the duration of exercise training in the appropriate heart rate training zone. Furthermore, patients determined the WP as user-friendly. However, more patient information on how to use the WP is needed.

Plan of action
Based on the results of this study, the WP will be integrated in the cardiac rehabilitation program of patients with HF. Additionally, the smartwatch will be used in collaboration with a local hospital as part of an integrated care pathway.

P52

Fatigue among young patients with acquired brain injury in the rehabilitation setting: interpreting and categorizing fatigue severity levels.

Florian Allonsius[1,2], dr. Frederike Van Markus-Doornbosch[1], dr. Arend de Kloet[1], Prof. dr. Thea Vliet Vlieland[1,2], dr. Jorit Meesters[1,2,3], dr. Menno van der Holst[1,2]
[1]Basalt Rehabilitation, [2]Leiden University Medical Center, [3]The Hague University of Applied Sciences

Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Introduction: Fatigue in young patients with acquired brain injury (ABI) is common. However, a clear way to categorize and interpret fatigue severity to better target and evaluate fatigue is lacking.
Objective: To determine fatigue, its relation with Health-related quality of life (HRQoL), and to categorize fatigue-severity in young patients with ABI referred for rehabilitation.
Patients: Children(5-12yr), adolescents(13-17yr) and young adults(18-24yr) with ABI and their parents in the outpatient rehabilitation setting.
Methods: This cross-sectional study used the PedsQL™Multidimensional-Fatigue-Scale to determine fatigue (18-items, patient&parent-reported, lower scores=more fatigue). Patient characteristics and mean (standard deviation; SD) fatigue and HRQoL scores were calculated per group. Fatigue-severity was categorized based on previously published scores from healthy agematched peers; 1"less fatigued"= >+1SD, 2"comparably fatigued"= -1SD to+1SD, 3"moderately more fatigued"= -1SD to-2SD, 4"severely more fatigued"= >-2SD.
Results: Two-hundred-sixty patients and/or parents participated (29% children, 54% adolescents, 17% young adults), 195(74%) had traumatic-brain-injury. Both patients and parents in all age-groups reported high fatigue-levels, means ranged from 40.2-57.5 (patient-reported) and 46.5-59.9 (parent-reported) per age-group. Older patients reported highest fatigue-levels (mean=40.2, SD=17.5). Scores in the "severely more fatigued"-category were common among 9% of the children, 50% of the adolescents and 58% of the young adults. HRQoL-scores decreased when patients/parents fatigue-scores related to a more severe fatigue-category.
Discussion/conclusions: Categorizing fatigue severity looks promising for clinical practice and showed that many patients were "severely more fatigued"-than healthy agematched peers.
Clinical message: Measuring and categorizing fatigue severity could help to better target and evaluate fatigue in young patients with ABI during (outpatient) rehabilitation treatment.

P53

Serious Gaming: What are the Possibilities for Innovative Cognitive Diagnostics in Children with Congenital Heart Disease?

Drs. Charlotte Southcombe[1,2], Drs. Eileen Bousché[1], Miss Malouke Visser[1], Monique van Schooneveld[2] , Hans Breur[2] , Dr. Tanja Nijboer[1,3]

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Clinical/experimental research:

Children with congenital heart disease (CHD) are at risk for cognitive impairment, which can significantly hamper academic performance and social integration, leading to decreased functioning in daily life. To better explain and predict cognitive impairment, there is an urgent need for more sophisticated tests that measure subtle cognitive impairment and the complexity and dynamics of everyday life. Virtual Reality (VR) Serious Games may be just what we need.

The objectives were: (1) to investigate the feasibility and user experience of a VR Serious Game; (2) to evaluate and compare cognition utilising conventional neuropsychological testing (NPA) and a VR Serious Game.

Children with CHD and typically developing children, aged 10 years.

To estimate cognition, a conventional NPA was administered and the children played six cognitive games. A user experience questionnaire was administered to evaluate feasibility and user experience.

The cognitive games were well received by both groups, which appeared to increase motivation. Associations between the NPA and the Serious Game require further analysis.

Innovative technology appears promising for NPA, especially with children who are enthusiastic about novel hardware and gaming. Whilst the conventional NPA remains a useful tool to estimate the patient's current optimal level of cognitive performance, VR Serious Gaming offers novel opportunities to assess cognitive abilities in more dynamic environments, increasing motivation.

By dynamically measuring cognitive performance, cognitive complaints and level of functioning can be better explained and predicted. In turn, enhanced care can be efficiently delivered through psychoeducation and treatment.

P54

Beter zorg dragen voor je eigen medicatie begint bij (revalidatie)verpleegkundigen

Bachelor of Nursing Femke Nabbe[1], Bachelor of Nursing Margot van den Blink[1], Dr. Annette Van Kuijk[1]
[1]*Tolbrug / Jeroen Bosch Ziekenhuis*

Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Introductie: Medicatie zelfmanagement training heeft als doel te zorgen dat de patiënt op een veilige en passende manier thuis voor zijn medicatie kan zorgen. Verpleegkundigen zijn verantwoordelijk voor deze training. We weten onvoldoende welke competenties zij hierbij inzetten en welke knelpunten zij ervaren.
Doel: Met behulp van het Generiek Model Zelfmanagement (GMZ) in kaart brengen welke competenties verpleegkundigen gebruiken bij medicatie zelfmanagement training en wat zij nodig hebben om aan te sluiten bij behoeften van patiënten.
Patiënten & Methoden: Kwalitatief onderzoek met 3 standaard casus bij verpleegkundigen werkzaam op de klinische revalidatieafdeling van Tolbrug. De casus bevatten competenties uit het GMZ voor patiënten (vermogen tot zelfontplooiing, vertrouwen in eigen kunnen, ziekte-specifieke kennis en vaardigheden), en voor zorgverleners (kennisoverdracht, coachvaardigheden, en wegwijzen voorzieningen).
Resultaten: Alle verpleegkundigen hebben oog voor zelfontplooiing van de patiënt, d.w.z. verminderd ziekte-inzicht en/of andere cognitieve problemen. Ook het ontbreken van vertrouwen in eigen kunnen wordt door alle verpleegkundigen gesignaleerd. Er is weinig oog voor medicatie-specifieke kennis en vaardigheden van de patiënt. Kennisoverdracht gebeurt door uitleg over aanwezige hulpmiddelen voor medicatie in eigen beheer, maar nauwelijks over medicatie-specifieke onderwerpen. Alle verpleegkundigen vinden coaching belangrijk onderdeel van training. Hoewel zij aangeven hierin voldoende ervaring en expertise te hebben, geven zij bij patiënten met verminderde zelfontplooiing aan behoefte te hebben aan ondersteuning. Wat zij specifiek nodig hebben, verschilt per verpleegkundige.
Conclusie: Bij medicatie zelfmanagement training kan winst behaald worden in medicatie-specifieke kennisoverdracht en in coachvaardigheden bij patiënten met verminderde zelfontplooiing. Om verpleegkundigen optimale ondersteuning te bieden, is maatwerk nodig.

P55

Rehabilitation after COVID-19: A short report

Drs. Roel Straathof[1], MD, Phd Henk Arwert
[1]*Basalt*

Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

COVID-19 infection can result in severe illnesses, making prolonged Intensive Care treatment necessary. Afterwards, persistent symptoms may arise, e.g. respiratory problems, muscle weakness and cognitive impairment.
Objective
To describe the characteristics and outcomes of patients who underwent inpatient multidisciplinary rehabilitation following COVID-19.
Patients
COVID-19 patients admitted for inpatient rehabilitation between March 1 and September 1, 2020.
Methods
Patient characteristics were recorded on admission. Clinical tests and questionnaires during rehabilitation entailed: Montreal Cognitive Assessment (MOCA), Hospital Anxiety and Depression Scale (HADS), PTSD Checklist for DSM-5 (PCL5) and physical tests.
Results
89 COVID-19 patients were included (30F/59M; age 58.9 (SD11.2)); BMI 27.4 (SD6.6); median hospital stay was 37 days (range 6-139)and 24 days at the Intensive Care Unit (ICU) (range 3-125). On admission 32 patients were still in need of oxygen; 22 (25%) patients had dysphagia of which 11 (50%) needed enteral feeding. Cognitive deficits were observed in 31% (MOCA<26); symptoms of anxiety or depression were observed in 19% and 12% respectively (HADS>7). Twelve patients (13%) were treated for Post-Traumatic Stress.
Median duration of inpatient rehabilitation was 28 days. All patients were discharged to their homes. Use of orthosis was necessary in 9 patients.
Discussion and conclusion
A selection of COVID-19 patients surviving hospitalization can benefit from inpatient rehabilitation. A multidisciplinary approach is imperative given the medical, cognitive and mental problems patients may experience. All patients were discharged to their home environment.
Clinical message
Inpatient multidisciplinary specialistic rehabilitation is indicated for a selected group of COVID-19 patients after Intensive Care treatment.

P56

Discussing personalized prognosis of survival in amyotrophic lateral sclerosis: A qualitative study of patients, caregivers, and physicians

Drs. Remko van Eenennaam[1], BSc Loulou Koppenol[1], MD, PhD Willeke Kruithof[1], MD, Drs. Esther Kruitwagen-van Reenen[1], MD Sotice Pieters[3], MD, PhD Michael van Es[2], MD, PhD Leonard van den Berg[2], MD, PhD Johanna Visser-Meily[1], PhD Anita Beelen[1]

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Introduction Amyotrophic lateral sclerosis (ALS) is a motor neuron disease with variable survival ranging from less than 1 year to over 20 years after symptom onset. The ENCALS survival prediction model offers patients with ALS the opportunity to receive a personalized prognosis of survival at diagnosis.
Objective To explore experiences of patients with ALS, caregivers, and physicians with discussing personalized prognosis.
Patients Recently diagnosed patients with ALS with whom the personalized prognosis was discussed (12), caregivers (9), and physicians (5).
Methods A qualitative study using semi-structured interviews (patients and caregivers), and a focus group (physicians). All transcripts were thematically analysed.
Results Patients' prognosis ranged from short to very long. Three overarching themes with eight subthemes emerged: Tailoring of communication: Emotional impact was mediated by the physician's communication style and tailoring of information provision. Personality and cognitions. Coping style, illness cognitions, and information needs affected how patients and their caregivers coped with the prognosis. Regaining control over the future. The emotional impact on patients ranged from happy and reassuring to regret, they found it helpful looking towards the future, and emphasized the importance of quality over quantity of time left. Themes were confirmed by the focus group.
Discussion and conclusions Personalized prognosis can be discussed with patients with ALS who want to know their life expectancy. Patients and caregivers underscored that how this was communicated was as, or even more important than what was communicated.
Clinical message Tailor discussion of personalized prognosis to emotional and information needs of patients and caregivers.

P57

Outcomes that matter to children and youth with a disorder of head, brain or senses

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Introduction
At the Pediatric Brain Center (PBC) of Erasmus MC – Sophia Children's hospital , a long-term follow up of children with neurodisability is set up. Patients and caregivers' input is needed to ensure the importance of outcomes to them.

Objective
To identify meaningful outcomes from the perspective of caregivers and children with neurodisability.

Patients
Children with neurodisabilty visiting the PBC or Rijndam Rehabilitation Centre

Methods
Fifty-eight outcomes of health and functioning were identified from the perspectives of caregivers and children, published studies and outcome sets. In an online survey respondents rated the importance of these outcomes on a 9 point Likert scale. Items rated as 'very important' by >=70% of the respondents were selected as meaningful outcomes.

Results
Thirty four surveys were completed (31 unique patients, mean age 9.1 years (SD 6,3 years) and 13 various diagnoses). We selected 27 meaningful outcomes addressing communication, mobility, relationships and participation in community, as well as learning, emotional function, behavior, senses, pain and physical health.

Discussion and conclusions
A large number of outcomes was considered meaningful by the vast majority of children with neurodisability and their caregivers. As expected, these cover multiple aspects of health and functioning.

Clinical message
For children with neurodisability, it is important to address social-emotional aspects as behavior, communication and interpersonal relationships, in addition to physical functions.

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P58

Focus groups study on the facilitators and barriers in wearing therapeutic footwear in different subgroups of Diabetic patients with loss of protective sensation

Drs. Athra Malki[1], Drs. Laurens van Kouwenhove[1], prof. dr. ir. Bart Verkerke[1,2], Prof. dr. Rienk Dekker[1], ass. prof. Juha Hijmans[1]

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Introduction

People with diabetes and loss of protective sensation have low adherence to therapeutic footwear. This is alarming, since therapeutic footwear is important to prevent foot ulcers. To improve the adherence, it is important to increase knowledge and awareness among people with diabetes as well as to understand which aspects are important in the perception of the use of footwear. This can be done with a focus group study.

Objective

Provide insight in the factors perceived as facilitators or barriers for wearing therapeutic footwear for different subgroups of people with diabetes.

Methods

Three group (n=24) discussions were organized. They are different based on experience with therapeutic footwear and the severity of the disease.

Results

The top three ranked factors related to use of therapeutic footwear, differed in the groups. The group with foot ulcers in the past, was the only group with 'ulcer prevention' in the top three. Although the other two groups with no ulcers in the past, found 'ulcer prevention' important too, it was not in their top three.

Discussion

Patients without ulcers in the past, can explain the importance of wearing therapeutic footwear to prevent foot ulcers when they are asked about it. However, it seems that they do not recognize the importance since it is not ranked in their top three most important factors for use of therapeutic footwear.

Message

More awareness on the importance of therapeutic footwear in primary prevention of foot ulcers is needed in people with loss of protective sensation due to diabetes.

P59

Self-efficacy training in persons with SCI

PhD Christel Van Leeuwen[1], Msc. Heleen Kuiper[1], PhD Janneke Stolwijk[1], PhD Marcel Post[1]
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Introduction: This poster presents the first results of a self-efficacy training in persons with Spinal Cord Injury (SCI) in the Hoogstraat Rehabilitation. This training is based on the "Re-inventing Yourself after Spinal Cord Injury" treatment programme for improving self-efficacy after SCI (Coker et al., 2019).
Objective: The aim of the poster is to present the first results of a self-efficacy training to enhance self-efficacy in persons with SCI in order to deal with their changing life circumstances after SCI.
Methods: Pilot pre-post design. At the start and the end of the self-efficacy training, depression and anxiety were assessed with the HADS and self-efficacy was assessed with the University of Washington-Self-Efficacy Scale. Moreover, qualitative interviews with participants and the 3 trainers took place at the end of the training.
Results: On average, participants scored higher on self-efficacy at the end of the self-efficacy training than at the start. Participants of the training were enthusiastic about the programme. They told they learned skills to cope with the SCI, e.g. to ask for help and to speak openly about their situation. The trainers of the self-efficacy training noticed a process of mental growth in the participants of the training due to discussing theory, practicing together and learning from peers.
Discussion and conclusion: A self-efficacy training stimulates self-efficacy in persons with SCI and seems a valuable part of a rehabilitation programme after SCI.
Clinical message: Based on these results, the self-efficacy training will be continued in the SCI rehabilitation programme of The Hoogstraat rehabilitation.

P60

Revalideren is Leren, óók voor zorgprofessionals.

Wat zijn de ervaringen, wensen en behoeften van zorgprofessionals?

Laura Jongmans[1], Rick van de Ven, Marcel Hendriks, PhD Martijn Pisters, MD PhD Annette van Kuijk
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Inleiding: Om de revalidant mede-eigenaarschap over zijn revalidatieproces te geven en de overstap naar de thuissituatie soepeler te laten verlopen, is op de klinische afdeling van revalidatiecentrum Tolbrug het concept Revalideren is Leren (R=L) geïmplementeerd. Binnen dit concept moet de zorgprofessionals zijn 'zorgbril' verwisselen voor een 'leerbril' en zo wel "leer" expert (coach), als inhoudelijk 'expert' zijn.
Patiënten & Methode: Via een kwalitatieve studie met semigestructureerde interviews zijn ervaringen, wensen en behoeften van verschillende zorgprofessionals die werken volgens het concept 'Revalideren is Leren' in kaart gebracht. In totaal zijn acht zorgprofessionals geïnterviewd in de periode van maart t/m april 2021.
Resultaten en discussie: Doordat er meer interdisciplinair wordt samengewerkt, zien professionals verbetering op de volgende vlakken: vakoverstijgend (interdisciplinair) werken, initiatief nemen, vrijheid, tijd en leren van elkaar. Wat zij nog moeilijk vinden is dat het proces van de revalidant leidend is bij de uitvoering, dat verwacht wordt dat ze meer 'doen met' in plaats van 'praten over'. Zij geven aan dat cognitief aangedane revalidanten zonder ziekte-inzicht lastiger meekomen in de open structuur van R=L. Het is voor professionals moeilijk regie te nemen in de uitvoering van revalideren is leren (ruimte nemen binnen de autonomie die zij krijgen). Het vertrouwen in zichzelf en elkaar ten aanzien van de beheersing van het concept R=L is nog niet optimaal.
Conclusie: De ervaringen van de zorgprofessionals van de klinische revalidatieafdeling binnen Tolbrug zijn overwegend positief over R=L. Veel verbeteringen hebben plaatsgevonden, maar voor vraagstukken rondom hun eigen regie zijn de zorgprofessionals nog zoekende.

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Revalideren is leren is voor iedereen

BSc. Angelique Bastiaans[1,2], BSc. Rick van de Ven[1], BSc. Marcel Hendriks[2], PhD. Martijn Pisters[2], PhD. Annette van Kuijk[1]
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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Inleiding: Om de overstap van revalidatie naar huis te verkleinen en de revalidant medezeggenschap te geven over zijn revalidatieproces, is er op de klinische revalidatieafdeling de Tolbrug de werkwijze ‘Revalideren is Leren’ (R=L) toegepast. Binnen deze werkwijze dienen de zorgprofessionals vakoverschrijdend aan de slag te gaan en protocollen los te laten. Zij nemen een generaliserende rol aan als revalidatiecoach om aan te sluiten op vragen van de revalidant.

Patiënten & Methode: Middels een kwalitatief onderzoek met semigestructureerde interviews zijn de drie basisbehoeften van verschillende zorgprofessionals die werken volgens het concept ‘Revalideren is Leren’ in kaart gebracht. De aanwezige mate van deze basisbehoeften geeft een indicatie voor de aanwezigheid van autonome motivatie en/of mogelijke groei hierin. In totaal zijn acht zorgprofessionals geïnterviewd in de periode van maart t/m april 2021.

Resultaten en discussie: De zorgprofessionals zijn nog zoekende naar hoe zij de werkwijze eigen maken. Zij hebben nog onvoldoende vertrouwen in elkaar om als één geheel interdisciplinair team de uitdaging aan te gaan. Dit geeft onzekerheid. De onzekerheid heeft effect op zowel de autonomie als competentie. De zorgprofessionals zijn vanwege de grote verandering nog aan het wennen. Structuur wordt gemist en dit heeft effect op het maken van eigen keuzes. Ook laat dit hen twijfelen aan het bezitten van voldoende kennis en kunde.

Conclusie: De drie psychologische basisbehoeften worden op dit moment onvoldoende ondersteund, waardoor het creëren en de groei van autonome motivatie beperkt wordt. De zorgprofessionals zijn op weg om de basisbehoeften te versterken, maar zijn hier nog zoekende in.

P62

Cognitive assessment in a digital era: current state-of-art in neuropsychological outcome

Drs. Eileen Bousché[1,3], I.K. Gosselt[2], H. Huygelier[1,4], T.C.W. Nijboer[1,2], C.L. Southcombe[1,3], L.A. Spreij[2], A.F. Ten Brink[1]

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Background: Cognitive performance is often assessed with neuropsychological paper-and-pencil tasks in a laboratory setting. This method is designed to assess the maximum capacity of the brain with respect to cognitive functions, given most optimal circumstances. In order to make predictions of cognitive performance during daily life situations, innovative techniques are required to mimic complexity and dynamics of daily life situations and to generate more fine grained outcome measures. This study provides an overview of current state of art to estimate cognitive capacity in dynamic situations with innovative techniques and novel outcome measures.

Method: A systematic review was performed (2008–2021) using PubMed and Scopus. Cognitive measures regarding memory, attention and executive functions were extracted from the following techniques: computer tasks, real-life tasks, serious games, Virtual Reality (VR) and Augmented Reality (AR) simulations. The current study focused on three novel outcome measures: Accuracy (e.g. hits, misses, false alarms, correct rejections, total score); Duration (e.g. reaction time; completion time; time target is found); Efficiency (e.g. effective strategy, rule break); Eye movement (e.g. eye fixations, duration fixations, number of gazes).

Results: Of the 546 articles were found, 55 articles met the inclusion criteria. 15 focusing on computer tasks, 13 real-life tasks, 27 VR simulations, no AR simulations and no Serious Games. Accuracy measures were most often used (80-100% of the studies, irrespective of technique). Total duration to complete the task was used in 54-74% of studies, irrespective of technique. Efficiency was used in 46% of real-life tasks and 41% of VR simulations. Only in 15% of VR simulations (and no other method), eye gaze events were measured.

Conclusion: Technological advances in neuropsychological assessment allow for novel, more sensitive and ecologically valid outcome measures. However, in most studies accuracy and total duration were used as estimations of cognitive capacities. Moreover, AR and SG techniques are mostly used for training motor skills. Even though designing more interactive simulations and tasks increases ecological validity, and even observing your patients during simulations will increase our insights in mechanisms underlying cognitive complaints in daily life, the potential of digitized assessment and novel sensitive outcomes measures is currently not employed to its full extent.

P63

Trends in defining and distinguishing virtual reality in post-stroke rehabilitation

Dr. Hanne Huygelier[1], MSc. Emily Mattheus[1], Prof. dr. Vero Vanden Abeele[2], Prof. dr. Raymond van Ee[3,4], Prof. dr. Céline Gillebert[1,5]

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Objective. Critique has been voiced on the broad use of the term “virtual reality” (VR), but this critique was not based on systematic evidence. In this study, we assessed how review papers on post-stroke rehabilitation defined VR and what types of mixed reality systems were described as “VR”.
Search strategy. We searched for reviews in Scopus, Web of Science and PubMed. Keywords for the search string were “stroke”, “virtual reality” and “rehabilitation” and synonyms for these terms.
Selection of articles. We identified 366 unique records through the database search and excluded 245 articles. Reasons for exclusion were: not a review; not about stroke, virtual reality or rehabilitation; no full text available; no full text in English or Dutch.
Results. 36% of reviews did not define VR. We identified 16 mixed reality types that greatly differed in level of immersion, the extent to which real and virtual information were mixed and the way patients interacted with the system. In contrast, the most common distinction of VR in the literature was into two categories (immersive versus non-immersive). In addition, the seven most frequently mentioned systems all used a 2D monitor with limited field of view rather than the latest immersive technology.
Conclusion. Our analysis revealed that reviews on post-stroke VR rehabilitation did not or only broadly defined “VR” and did not focus on a specific system. Since the efficacy and feasibility of rehabilitation may depend on the specific system, we propose a new data-driven taxonomy to distinguish different systems.

C1. The value of PROMIS (Patient-Reported Outcomes Measurement Information System) in stroke populations; recommendations and limitations.

Dr. Henk Arwert[1], prof. dr. Caroline Terwee[2], Dr. Paulien Goossens[3], PhD Diana Oosterveer[1], drs Joris de Graaf[4]

[1]Basalt Revalidatie, [2]Amsterdam UMC, Epidemiology and Data Science, [3]Merem Revalidatie, [4]UMC Utrecht, afd revalidatiegeneeskunde

C1. Workshop: The value of PROMIS (Patient-Reported Outcomes Measurement Information System) in stroke populations; recommendations and limitations, November 12, 2021, 9:05 AM - 10:05 AM

session description:
Learning objectives:
Health outcome measurement can serve several goals, it can stimulate the improvement of care in specific populations, can contribute to clinical decision making in individual patients or can serve as a benchmark. In this workshop the most recent insights will be shared regarding the choices to made in measuring health outcomes after stroke in order to close the circle of value based health care. In this respect, PROMIS is gaining ground as a tool in health outcome measurement since its introduction in 2007.
Participants will be able to understand the choices to be made in the implementation of PROMs in stroke populations, and can value the outcomes.

Chair / presenters:
P.H. Goossens (RvB Merem en revalidatiearts; lid van wetenschappelijke raad van Stichting Revalidatie Impact): The do's and don'ts in value based health care, an introduction.
C.B. Terwee (Associate Professor, Epidemiology and Data Science, Amsterdam UMC): The value of PROMIS item banks in value based health care, general perspectives and pitfalls.
H.J. Arwert (revalidatiearts Basalt Revalidatie): The use of PROMIS in stroke populations, an overview.
J.A. de Graaf (revalidatiearts UMC Utrecht & PhD student Kenniscentrum Revalidatiegeneeskunde Utrecht): Towards value-based stroke care: a comparison among commonly used Patient-Reported Outcome Measures (PROMs) to evaluate stroke outcomes.
D.M. Oosterveer (revalidatiearts Basalt Revalidatie): Measurement properties of PROMIS item banks in stroke.
Chairperson: P.H. Goossens

Outline session:
Patient reported outcome measures (PROMs) are essential in evaluating the outcomes of health care. However, current PROMs are limited by a lack of precision, standardization, and comparability of scores across studies and diseases. The challenge is to select a questionnaire that firstly fits the research question optimally, and secondly has adequate psychometric properties in the field of interest.
In 2007 the Patient-Reported Outcomes Measurement Information System (PROMIS) became available. PROMIS measures are questionnaires that cover generic as well as specific domains. All PROMIS measures use the same metric and are standardized to the US population. The use of a normalized distribution (scale T-score with a mean of 50, and SD of 10 in a general population) enhances interpretability. PROMIS measures have been applied in numerous patient groups such as spinal surgery, critical illness, low back pain, anxiety in young cancer patients, chronic pain and general rehabilitation populations.
The International Consortium for Health Outcomes Measurement (www.ICHOM.com) promotes the use of PROMIS-GH (Global Health) as a part of routine outcome measurement for stroke patients (follow up to 3 months). The PROMIS-GH consists of 10 items and leads to two generic component scores measuring symptoms and quality of life: global physical health and global mental health.

C2. De techniek staat voor niets: technologische ontwikkelingen in de zorg voor patienten met een spierziekte.

Dr. Nicole Voet[1,2], Dr. Mariska Janssen[1,2], Dr. Nens van Alfen[3], Dr. Jonne Doorduin[3], Ties Klok[1], Marjolein Paus[1]
[1]Revalidatiecentrum Klimmendaal, [2]Radboudumc, afdeling Revalidatie, [3]Radboudumc, afdeling Neurologie

C2. Workshop: De techniek staat voor niets: technologische ontwikkelingen in de zorg voor patienten met een spierziekte, November 12, 2021, 9:05 AM - 10:05 AM

Binnen de neurologie in Nederland wordt echografie voor een toenemend aantal indicaties toegepast. Zo toonde recent onderzoek dat echografie beter in staat is een diafragmaparese aan te tonen dan röntgenfoto's of een EMG, bovendien kan dit onderzoek ook dynamisch worden ingezet.
Diafragmadisfunctie blijkt meer voor te komen bij spierziekten dan aanvankelijk werd gedacht en kan voor een fors verminderd functioneren zorgen. In de richtlijn ' carpaletunnelsyndroom ' wordt echografie zelfs als eerste voorkeur genoemd boven EMG op basis van patientvriendelijkheid.

Voor mensen met een spierziekte is de wereld door Corona nog kleiner geworden. Gamen wordt daardoor een nog belangrijker tijdverdrijf. Maar de normale besturingssystemen van spelcomputers zijn niet altijd geschikt. Het aangepast gamen heeft in het afgelopen coronajaar een vlucht genomen in Nederland.

In Nederland zijn technische universiteiten samen met revalidatie-afdelingen toenemend actief in het ontwikkelen van exoskeletten voor armen, benen en/of romp.
Uiteindelijk is het idee om alle componenten te integreren tot een full body exoskelet dat licht en comfortabel draagbaar is, de spierfunctie ondersteunt en daarmee de functionaliteit behoudt. De dag dat revalidatieartsen naast een enkel-voet-orthese een exoskelet, een aangepaste gamecontroller of een echo van het diafragma gaan voorschrijven, komt steeds dichterbij: wees voorbereid!

Dit programma is samengesteld vanuit de VRA NMA werkgroep, onder voorzitterschap van dr. Nicole Voet, revalidatiearts Klimmendaal/ Radboudumc:

1. Drs. Ties Klok, kinderfysiotherapeut Klimmendaal:
de (on)mogelijkheden van aangepast gamen voor kinderen en volwassenen met een spierziekte. (10 minuten)
2. Dr. Nens van Alfen, neuroloog en Dr. Jonne Doorduin, technisch geneeskundige afdeling neurologie Radboudumc:
echografie van het diafragma en de carpale tunnel: waardevolle diagnostiek in de neurologie. (25 minuten)
3. Dr. Mariska Janssen, medior onderzoeker en Nicole Voet, revalidatiearts Klimmendaal en afdeling Revalidatie Radboudumc:
doe-het-zelf: ontwerp een exoskelet voor armondersteuning voor jongens met Duchenne (25 minuten)

Doelen:
- Leer welke mogelijkheden beschikbaar zijn om gamen toegankelijk te maken voor mensen met een beperking en hoe dit kan bijdragen aan het welbevinden van uw patiënt
- Leer over de nieuwste ontwikkelingen en mogelijkheden op het gebied van echografie bij spier- en zenuwziekten
- Krijg informatie over het ontwerpproces van een exoskelet
- Leer de wensen van de patiënt mee te nemen in het ontwerp van een exoskelet
- Leer hoe artsen en technici samenwerken in de ontwikkeling van medische hulpmiddelen

C3. Ambulatory 3D movement analysis using inertial sensors. Enabling 3D movement analysis in everyday clinical practice

Prof. dr. Jaap Buurke[1,2,3], MD Martin Oude Alink[3], Ir. Chris Baten[1], MSc Roelien Russcher[2], Dr Marc Nederhand[1,3]

[1]Roessingh Research And Development, [2]Department of Biomedical Signals & Systems, Technical Medical Centre, University of Twente , [3]Roessingh Rehabilitation Centre

C3. Mini-symposium: Ambulatory 3D movement analysis using inertial sensors. Enabling 3D movement analysis in everyday clinical practice, November 12, 2021, 9:05 AM - 10:05 AM

In current clinical practice, 3D movement analysis is an important tool to assess patients and guide clinical decision making. It provides objective data about individual walking patterns and effects of treatments aiming to improve walking. 3D movement analysis however is lab based, expensive and labour and time intensive. Wearable sensors are cheap and easy to apply within limited amount of time. As such, wearable sensors not only have the potential to replace expensive lab based 3D opto-electronic devices but also offer the possibility to assess individuals outside the lab during therapy or in their natural habitat. This symposium will combine knowledge from different projects targeting the use and development of wearable sensors for 3D movement analysis inside and outside the lab.

The first contribution focuses on the clinical applicability of IMUs and why it is clinically relevant to acquire kinematics (and kinetics) outside the lab. The latter is related to the Hawthorne effect, a type of reactivity in which individuals modify an aspect of their behavior in response to their awareness of being observed. This is followed by an overview of commercially available and newly developed systems and their suitability for 3D assessment in pathological gait. Finally the validity and usability of such a newly developped application will be presented and discussed. This will be the Portable Gait Lab, a 3 IMU set-up able to measure kinematics and kinetics in patients with an asymmetric gait (e.g. stroke).

Learning objectives:
1) Acquire knowledge about the advantages and disadvantages of using wearable sensors in 3D movement analysis.
2) Understand the added value of acquiring 3D data outside the lab.
3) Insight in the validity and usability of the Portable Gait Lab for patients after stroke.

Outline session

Introduction symposium
Chair: Prof. J.H. Buurke, PT, PhD.
3 min

Clinical applicability of IMUs for 3D movement analysis
Presenter 1: M. Oude Alink, MD
15 min

Commercially available and newly developed systems. Suitability for 3D assessment of pathological gait
Presenter 2: C. Baten, Ir
15 min

Validation study of the Portable Gait Lab for patients after stroke
Presenter 3: R. Russcher, MSc;

15 min

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

Total 60 min

C4. Impact through joint innovation, research and implementation: The Next Step for young patients (<25 years) with acquired brain injuries in need of rehabilitation treatment.

Dr. Menno Van Der Holst[1,4], Dr. Arend de Kloet[1], Msc Florian Allonsius[1,4], Christiaan Gmelig Meyling[2], Drs. Sandra Te Winkel[3]

[1]Basalt Rehabilitation, [2]De Hoogstraat Rehabilitation, [3]Merem, [4]Leiden University Medical Center

C4. Mini-symposium: Impact through joint innovation, research and implementation: The Next Step for young patients (<25 years) with acquired brain injuries in need of rehabilitation, November 12, 2021, 9:05 AM - 10:05 AM

Session description/introduction

Every year around 400/100.000 children, adolescents and young adults in the Netherlands suffer from acquired brain injury (ABI), including traumatic brain injuries (TBI) and non-traumatic brain injuries (nTBI). Consequences after onset may vary, but approximately 30% of these patients need help due to (often "invisible") daily life problems, which frequently results in referral to rehabilitation.

To guide the chain of care, a standard of care was developed for young patients with TBI in 2016. However, not all patients with ABI receive the care they need to counteract all their problems in daily life due to multiple causes, such as inadequate referral and/or variation in treatment strategies. In addition, many questions remain regarding the content and effects of (physical) rehabilitation interventions in young people with ABI. Furthermore, patients report a need for peer contact and more and better information, including 'return to participation'.

Therefore, we are currently in need of further developed guidelines to be able to provide 'the right treatment, at the right time, in the right place' for these young patients with ABI. To achieve this, multiple projects were started with the ultimate goals to provide uniformity and innovative treatment, better information provision and peer support. For these projects, multicenter research and collaboration has been set-up and novel ways of interpreting patient (and parent) reported outcomes have been created and the latest insights into rehabilitation treatment in this patient group has been investigated. In addition, the use of e-health and other innovative ways to improve peer support and information provision have been explored leading to new products to optimize care for patients with ABI.

This mini symposium brings together different experts from the field of ABI research, innovation and treatment in rehabilitation. They will share with other health professionals the latest insights in treatment, outcome interpretation, peer support and information provision (through e-health and other innovations) and the future vision for rehabilitation treatment in young people with ABI. This mini symposium will also be of interest to healthcare professionals interested in learning how to create collaborations and using innovations to enhance treatment in other chronic conditions.

Session outline and objectives:

Present and discuss:

- The path towards creating a uniform treatment for patients with ABI
- The use of outcome measures (participation, quality of life, fatigue and family impact) and optimizing their interpretation to enhance shared decision making in rehabilitation treatment

- The latest insight in physical rehabilitation interventions to enhance functional recovery and performance in daily functioning
- Novel ways to enhance peer support and information provision
- Improving psychoeducation/information on practical problems in daily life such as returning to participation
- The vision for the future of rehabilitation treatment for ABI in the Netherlands

Presentation titles and speakers:

- Introduction: Rehabilitation in young patients with ABI, where do we stand?
  (Chair: dr Arend de Kloet, Basalt) **3 minuten**
- Meedoen Next Step; towards the right care, at the right time, at the right place
  (dr Menno van der Holst, Basalt) **7 minuten**
- Outcome measures and their interpretation in Rehabilitation treatment
  (Florian Allonsius, Basalt) **10 minuten**
- Physical rehabilitation interventions in children and youth during subacute rehabilitation; outcomes of scoping review
  (Christiaan Gmelig Meyling, De Hoogstraat Revalidatie) **10 minuten**
- Breinstraat; an innovative way to facilitate peer expert support and information provision (dr Arend de Kloet Basalt/Patient partner) **10 minuten**
- The future of (e-)rehabilitation treatment for patients with ABI; the vision of HeJ (Sandra te Winkel, chair of the taskforce Hej, part of the “kindersectie VRA”). **10 minuten**
- Q&A **10 minuten**

C5. Rehab at work in progress

Prof. Coen Van Bennekom[1,2], Prof. dr. Michiel Reneman[3], PhD Harald Miedema[4], MD Ellen Roels[3], PhD Judith Mollet[2]

[1]Heliomare, [2]Amsterdam UMC, Universiteit van Amsterdam, Afdeling Public and Occupational Health, Coronel Instituut voor Arbeid en Gezondheid, Amsterdam Public Health research institute, [3]University Medical Center Groningen, Department of Rehabilitation Medicine, Center for Rehabilitation, [4]National Health Care Institute

C5. Mini-symposium: Rehab at work in progress, November 12, 2021, 9:05 AM - 10:05 AM

Session description+ learning objectives
Rehab at work in progress.
This session gives you an update on guidelines, reimbursement, measurements and innovative vocational activities.

Learning objectives:
- To have insight in vocational rehabilitation activities that can be part of reimbursable rehabilitation programs and can enhance work participation as well as health outcomes.
- To hear about the recently revised Dutch guideline on acquired brain injury (ABI) and work and the tasks of the rehabilitation professionals.
- To have knowledge about the measurement properties of the full and the brief version of the WORQ in persons with physical disabilities and the content validity of the WORQ for use in persons with spinal cord injury (SCI) specifically.
- To learn about 3 main components of successful vocational rehabilitation and how it is applied in Dutch care-as-usual for patients with musculoskeletal disorders (MSD).
- To hear about the Individual Placement and Support (IPS) method and its (possible) feasibility for use in people with ABI.

Chair/presenters
Chair: Coen van Bennekom

Presenter 1: Harald Miedema
Title of the presentation: Vocational rehabilitation activities within in Rehabilitation Care.

Presenter 2: Coen van Bennekom
Title of the presentation: How to implement the Dutch guideline on acquired brain injury (ABI) and work in daily practice.

Presenter 3: Ellen Roels
Title of the presentation: The Work Rehabilitation Questionnaire (WORQ): Measurement properties of the full and brief version in persons with physical disabilities and content validity for persons with spinal cord injury.

Presenter 4: Michiel Reneman
Title of the presentation: Evaluation of work- and economic outcomes of Dutch care-as-usual vocational rehabilitation with and without an additional work module for patients with chronic musculoskeletal disorders.

Presenter 5: Judith van Velzen
Title of the presentation: Individual Placement and Support in people with Acquired Brain Injury.

Outline session

The session starts with an overview of vocational rehabilitation activities focusing on improvement of work participation and their relationship with reimbursement under the Dutch healthcare insurance law. Secondly, the revised Dutch guideline on ABI and work is presented with special focus on the tasks of rehabilitation professionals.

The session continues how to assess work-related functioning. The WORQ consists of a selection of categories from the ICF. A comprehensive and a brief version are available [https://myworq.org]. The measurement properties in persons with physical disabilities will be presented. Furthermore, content validity of the WORQ in persons with SCI will be discussed.

The session ends with two practical examples of vocational rehabilitation:

-Vocational rehabilitation programs, for example in patients with chronic MSD, have 3 main components: work-directed rehabilitation, work modifications and service coordination. A work module is designed to go beyond 'clinic-based' rehabilitation and reimbursed by the employer. Worth the extra effort and costs?

-IPS is an effective method to support people with psychiatric disorders without an employer in finding and staying in paid work. It is now investigated whether IPS can also be used in people with ABI. An outline of IPS and the research that is performed will be presented.

C6. Gait analysis of tomorrow: Precision diagnostics using instrumented treadmill technology

Dr. Marjolein van der Krogt[1], Prof. Annemieke Buizer[1], Drs. Laura Oudenhoven[1], Drs. Eline Flux[1], Drs. Sjoerd Timmermans[1]

[1]*Amsterdam UMC, Department of Rehabilitation Medicine*

C6. Mini-symposium: Gait analysis of tomorrow: Precision diagnostics using instrumented treadmill technology, November 12, 2021, 9:05 AM - 10:05 AM

Clinical gait analysis is a common tool in rehabilitation medicine to unravel the underlying causes of gait problems in various patient populations. Typically, gait analysis is performed on an overground walkway of around 10m, but this limits the analysis to just a few steps of unperturbed, unfatigued walking at a comfortable pace. Recent advances such as the Gait Realtime Analysis Interactive Lab (GRAIL) allow for real-time analysis in a virtual environment on an instrumented treadmill, opening up new opportunities for advanced gait assessment in more challenging environments.

In this mini-symposium we present our recent scientific work using advanced treadmill technology, focusing on the effects of AFO tuning, the assessment of spasticity during gait, and the evaluation of gait problems that arise with longer walking and the occurrence of fatigue. Furthermore, we present how to apply this technology in a clinical rehabilitation setting, using standardized clinical protocols that help improve the diagnostics of complex gait problems. We focus on the application of these protocols in both paediatric and adult neurological populations.

Learning objective(s): Discover the latest advances in gait diagnostics using instrumented treadmill technology, learn about their theoretical background and recent research findings, and find out how to apply the developed protocols in your own clinical practice.

Presenters and session outline:

Prof. Annemieke Buizer, MD, PhD (chair):	Introduction to gait problems in rehabilitation medicine (5 min)
Marjolein van der Krogt, PhD:	How advanced technology can help improve gait diagnostics (5 min)
Laura Oudenhoven, MSc:	Stay Tuned! How do manipulations in ankle-foot orthosis alignment affect gait in children with cerebral palsy? (10 min)
Eline Flux, MSc:	Functional assessment of hyperreflexia using treadmill perturbations and the use of dynamic ultrasound in children with cerebral palsy (10 min)
Laura Oudenhoven, MSc:	Interaction between walking-induced fatigue and gait problems in children with cerebral palsy (10 min)
Sjoerd Timmermans, MD:	Prolonged walking assessment to understand the determinants of gait and balance problems in people with multiple sclerosis (10 min)
Interactive discussion	*(10 min)*

C7. Lifestyle in people with a disability: the role of the environment and data driven decision making.

Dr. Janneke Haisma[1]
[1]Spaarne Gasthuis, [2]Rijndam Revalidatie, [3]Martini Ziekenhuis, [4]Kennis Centrum Sport en Bewegen

C7. Mini-symposium: Lifestyle in people with a disability: the role of the environment and data driven decision making, November 12, 2021, 9:05 AM - 10:05 AM

This Mini Symposium will be organised by the VRA Werkgroep Bewegen en Sport (WVBS).

Aim: Speakers from both rehabilitation and corporate settings show us how the decisions we make are influenced by our environment and by the visualisation of data. With this knowledge we can help our patients make healthy choices.

Rationale:
Direct surroundings influence the choices we make: readily available delicious looking food invite us to choose a healthy option. Massive data collection and processing (e.g. on smart watches) also guide our decisions on hours of sleep or heart-rate while running.

A lifestyle with regular physical activity, sufficient sleep, and healthy eating behaviour is crucial for people with a disability; not only to preserve treatment effects but also to prevent the development of cardiometabolic diseases and other secondary health problems. However, a growing body of evidence points at unfavourable lifestyles in people with a physical disability.
Fortunately, rehabilitation professionals increasingly focus on promotion of a healthy lifestyle in their patients.
We feel that current lifestyle interventions may gain from strongly incorporating the environment (e.g. healthy options, peer support) and data driven decisions (e.g. physical activity trackers) to enhance long-term (cost-) effectiveness.

Chair:
Janneke Haisma, revalidatiearts Spaarne Gasthuis Haarlem, voorzitter WVBS

Programma:
Rita van den Berg-Emons, Associate Professor "Health-related physical fitness and lifestyle interventions", Erasmus MC en Rijndam RC.
Presentatie over onderzoek naar het effect van gedragsmatige interventies en objectieve dataverzameling (over activiteiten) bij mensen met een chronische aandoening.

Jeroen Pronk, directeur Centre of Expertise Healthy Ageing aan de Hanzehogeschool Groningen en oprichter van SamenGezond, een initiatief van Menzis.
Welke marketingstrategieën kun je toepassen om mensen aan te zetten tot gezond gedrag?

Deskundige op gebied gedrag:
Hoe bepaalt de fysieke en sociale omgeving de gezonde (on)bewuste keuzes die je maakt?

C8. Mitigating Post-Intensive Care Syndrome throughout the care continuum: state of the art and challenges for rehabilitation

Dr. Marike Van Der Schaaf[1,2], Dr. Bea Hemmen[3,4], MD Martijn Dremmen[3], Msc., PhD candidate Mel Major[1,2], Msc., PhD candidate Robin Kwakman[1,2]

[1]Amsterdam UMC, University of Amsterdam, Rehabilitation medicine, Amsterdam Movement Sciences, Meibergdreef 9, [2]Amsterdam University of Applied Sciences (HvA) Faculty of Health, Center of Expertise Urban Vitality, , [3]Zuyderland Medisch Centrum / Adelante Zorggroep, [4]Maastricht UMC

C8. Mini-symposium: Mitigating Post-Intensive Care Syndrome throughout the care continuum: state of the art and challenges for rehabilitation, November 12, 2021, 9:05 AM - 10:05 AM

Outline session:
The audience will be taken at a patient journey through his rehabilitation trajectory from the ICU to his own home.

- Welcome by Marike van der Schaaf

- Rehabilitation for patients with the Post Intensive Care Syndrome from ICU to home; the state of the art. (10 minutes, including discussion by Marike van der Schaaf)
With the COIVD-19 pandemic the awareness of the urgency for a seamless rehabilitation trajectory for survivors of critical illness with the Post Intensive Care Syndrome has raised. In this presentation, an overview of the current state of the art on rehabilitation interventions will be provided.

- Rehabilitation in the ICU: walking towards independence using novel technology (10 minutes, including discussion by
Robin Kwakman)
Ambulation training with critically ill patients is difficult because of muscle weakness, low exercise capacity and the attachment of medical and monitoring equipment. Using a mobile treadmill with the ability to support body weight may overcome the barriers and facilitate early ambulation training in critically ill patients, but does it shorten the recovery time of independent ambulation?

- Practical and organizational aspects of rehabilitation care at the hospital ward (10 minutes, including discussion by Martijn Dremmen)
Which practical and organizational challenges do we have to face in delivering the right rehabilitation care at the right moment at the right place, during hospital stay? In this presentation we will discuss possible problems to face, but also changes to take in improving the rehabilitation care for the critical ill patient in the hospital phase.

- Recovery at home: multidisciplinary rehabilitation interventions for patients with PICS in the community: REACH (10 minutes, including discussion by Mel Major)
How can we best provide rehabilitation interventions after hospital discharge for patients who have survived critical illness? An overview of the latest evidence on interdisciplinary, personalized interventions targeting health holistically, in light of a best practice example: the REACH network.

- Introduction to the VRA working group on PICS (10 minutes, including discussion by Bea Hemmen)
In this interactive session, the aims and actions of this new VRA working group will be discussed with the audience.

- Discussion Towards a seamless rehabilitation trajectory for PICS
Speakers and audience

D1. The Right to Health in Rehabilitation Medicine: is your work, deparment or institute right to health proof?

Drs. Marga Tepper, MD Adriaan van Es, Karin Schepman, MD Esther Schutte
[1]UMCG, [2]IFHHRO

A2. Workshop: The Right to Health in Rehabilitation Medicine: is your work, deparment or institute right to health proof?, November 11, 2021, 2:10 PM - 3:10 PM

Chairs: Marga Tepper & Karin Schepman
Keynote speaker: Adriaan van Es MD, Secretary IFHHRO
Speaker Karin Schepman en Esther Schutte
Facilitators: Members of the VRA work-group Transcultural Rehabilitation Medicine Jos Dekker, Fons van Dijk, , Wim Otto and Alicia Lucardie

Learning objectives:
The participant is aware of the Right to the highest attainable standard of health (WHO)
The participant knows the background of the Right to health screening tool
The participant recognises the medical ethical dilemmas in daily practice arising from the Right to health assessment and is able to present recommendations to the department or institute management for implementation of Right to health

Introduction
Health workers in the field of Rehabilitation Medicine such as physicians, nurses and physiotherapists are firmly 'rooted' in their workplace, as most health workers are.
Besides their clinical work they face requirements like regular additional medical training for professional registration, legal- and regulatory demands. They are also expected to work according to the Human Rights Standards conceived in many European- and (Inter)national Conventions and other legal instruments.
The right to the highest attainable standard of health (the Right to Health) is the most comprehensive instrument used to assess the human rights conditions of health practices.

Goal of the workshop
To introduce to the participants a Right to Health screening tool, especially designed for health workers. The tool will enable you to observe and assess your present – and perhaps future – workplace through the lens of international relevant human rights standards, and offer realistic steps for change to achieve these standards.

Outline of Session
Speaker 1: Adriaan van Es (15 min)
Title: The crucial role of health professionals in the implementation of the Right to Health

Short summary: Health professionals are often the first (and only) witness of violations of the Right to Health (and human rights in general). They are therefore in a unique position to contribute to the full realization of the Right to Health. Given their full agenda of clinical responsibilities, they require a workable and concise assessment and implementation tool.

Speaker 2: Karin Schepman/ Esther Schutte (15 min)
Title: the Right to health screening tool
Brief summary: the recently developed Right to health screening tool for assessment of your work will be introduced and some statements concerning daily practise in Rehabilitation Medicine will be discussed.

In groups (per group maximum 8 participants and 1 facilitator of the VRA work group Transcultural Rehabilitation medicine (WTCR) (25 min)
The participants work with the screening tool to get a first impression how right to health proof their work is. Participants will discover human right issues and discuss their daily practice using the Right to Health assessment tool.

Closure chairs M. Tepper and Karin Schepman (5 min)

Participants (max. 40 participants; 5 groups of 8 participants)
Healthcare workers interested in a right-based approach to rehabilitation service delivery.

References

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2. WHO, human rights and health, keyfacts, 2017. https://www.who.int/news-room/fact-sheets/detail/human-rights-and-health
3. Delivering quality health services, A global imperative for universal health coverage WHO, OECD, International Bank for Reconstruction and Development, The World Bank, 2018

D2. “Finding better ways to put therapy into practice”: Over interactief en intensief oefenen van dagelijkse activiteiten in de kinderrevalidatie.

Ralph Boumann[1], Prof. Jan Willem Gorter[2], MD Inez van der Ham[3], - -[4], - -

[1]Rijndam Revalidatie, [2]CanChild Centre for Childhood Disability Research, McMaster Univeresity Hamilton, University Medical Centre Utrecht, [3]Rijndam Revalidatie, [4]Rijndam Revalidatie

D2. Workshop: “Finding better ways to put therapy into practice”: Over interactief en intensief oefenen van dagelijkse activiteiten in de kinderrevalidatie, November 12, 2021, 11:00 AM - 12:00 PM

Kinderen oefenen bij de kinderrevalidatie veel vaardigheden die ze nodig hebben voor het dagelijks leven (ADL). Het is een bekend verschijnsel in de (kinder)revalidatie, dat het lastig blijkt om hetgeen wat is aangeleerd in de therapiesituatie toe te passen in de eigen leefomgeving. Daarmee missen we kansen om het kind zich optimaal te laten ontwikkelen en te participeren. Diverse factoren spelen daarbij een rol. Het optimaliseren van therapie is een belangrijk onderwerp voor wetenschappelijke studies en projecten in Nederland en internationaal, zoals in Canada.

Zo is er bij Canchild Canada onderzoek gedaan naar de effecten van hoe en waar therapie wordt gegeven. Hier zijn mooie voorbeelden van blended care uit ontwikkeld, waarbij therapeuten vanuit behandelcentra werken met het kind en gezin om ADL te vergroten thuis, op school en in de communicatie. De “F-Woorden”-aanpak is daarbij een goed voorbeeld.

Op initiatief van twee ergotherapeuten bij Rijndam is het blended zorgpad “iADL” ontwikkeld. Hierbij kunnen zorgverleners live digitaal thuis meekijken wanneer het kind de ADL-taak uitvoert en ouders kijken mee met het oefenen op locatie. Hier wordt coaching toegepast en wordt meegekeken naar toepassingen in de omgeving. iADL sluit beter aan bij gezinnen verkleint de “gap”.

Leerdoelen:
- inzicht in de “F-Woorden”-aanpak als uitgangspunt voor nieuwe behandelvormen in de kinderrevalidatie
- beter zicht op de inrichting van interactieve behandelingen op een “blended wijze” zoals iADL.
- adviezen t.a.v. implementatie en opschaling van innovatief idee
- delen van ervaringen en aandachtspunten betrekken van gezinnen, skills voor betrokken therapeuten.
- delen van ervaringen over de blended care

Daarnaast willen we een multi-disciplinaire paneldiscussie houden over de ontwikkelingen van interactieve digitale toepassingen nu en in de toekomst. Op welke wijze kan dit de participatie van kinderen vergroten en hoe kunnen we hen bij ontwikkelingen betrekken? Welke lessen kunnen we trekken uit de ervaringen? Welke risico’s zijn er en hoe kun je die overwinnen?

Interactie met publiek, bijvoorbeeld door inzet van mentimeter, en eventueel op andere wijzes, afhankelijk van de ICT-ondersteuning die geboden wordt.

Programma:
5 minuten Introductie sprekers en probleemanalyse; leerdoelen door Inez van der Ham
10 minuten De F-Woorden aanpak en ervaringen met blended care vanuit CanChild, Canada
10 minuten Ontwikkeling blended “iADL” door ergotherapeut, vanuit Rijndam Revalidatie
5 minuten De implementatie & opschaling van het iADL-traject (op basis van het implementatieplan) door Ralph Bouwman

10 minuten De meerwaarde van iADL door ouder en/of kind: interview
5 minuten Lessen voor andere centra: Coachende vaardigheden: wat vraagt het van zorgverleners?
15 minuten Paneldiscussie: deelname Jan-Willem Gorter, CanChild Canada, hoogleraar kinderrevalidatiegeneeskunde, ergotherapeut(en)/ouder

Sprekers/deelnemers tijdens workshop:

- Prof. Jan Willem Gorter, MD PhD, rehabilitation physician, Director of the CanChild Centre for Childhood Disability Research, McMaster University Hamilton, visiting professor University Medical Centre Utrecht, the Netherlands.
- Inez van der Ham, MD, rehabilitation physician Rijndam Rotterdam
- Ouder en eventueel een kind die iADL-traject heeft deelgenomen of andere manier heeft geparticipeerd. (evt per film)
- Ergotherapeut(en)
- Nadere contacten worden gelegd maar zijn nog niet definitief ten tijde van indienen.
- Workshopvoorzitter: Ralph Bouman (Adviseur digitale zorg & innovatie)

D3. Wearable technology in upper limb stroke rehabilitation; innovative application in daily activities and at-home exercise.

Dr. Hans Bussmann[1], Dr. Carel Meskers[2], Dr. Anne Schwarz[3], Dr. Ruben Regterschot[1,4], Drs. Nienja Langerak[1], Dr. Eline van der Kruk[5]

[1]Erasmus MC, [2]Amsterdam University Medical Center, [3]University of Zürich, [4]University of Twente, [5]TU Delft

D3. Mini-symposium: Wearable technology in upper limb stroke rehabilitation; innovative application in daily activities and at-home exercise, November 12, 2021, 11:00 AM - 12:00 PM

After stroke intensive arm use and therapy is essential for gaining and retaining functional improvements. Because of high costs, shortage of therapists, patient burden and adherence issues, intensive arm treatment is scarcely applied, and this will become even more challenging in the future. Therefore, there is an urgent need for sustainable, technology-supported and motivating treatment and monitoring in the home setting, focusing on both daily life functioning and at-home exercise. Sensor technologies will be essential in creating this change.

In this minisymposium (chaired by Hans Bussmann) we will present and discuss with the audience current and future applications. Presentations (10 minute each) are:
1. Upper-limb stroke rehabilitation and technology: the clinician perspective (Carel Meskers)
2. Improving the amount of daily life arm use with objective activity feedback in stroke patients: The Arm Activity Tracker (Nienja Langerak)
3. Sensor-based assessment of the quantity and quality of arm use after stroke (Ruben Regterschot)
4. Upper limb movement quality measured with wearable: relationships with clinical assessments and daily life behaviour (Anne Schwarz)
5. Optimizing rehabilitation: the invisible therapeutic hand (Eline van der Kruk)

After the minisymposium attendees:
- have insight in the potential of technology (wearables and advanced anaytical techniques) in arm rehabilition after stroke specifically, and rehabilitation in general;
- have knowledge on an interactive tool for self-directed, home-based and personalized arm rehabilitation after stroke

D4. How transforming an electronic rehabilitation record can contribute to value based health care.

Dr. Paulien Goossens[1], Drs. Fenna Eefting[2], Drs. Susanne van Vegten[1], BSc Marcel Collombon[3], Dr. Erik Gerritsen[4]

[1]Merem Medische Revalidatie, [2]Vogellanden, [3]Asterisque, [4]ministerie VWS

D4. Mini-symposium: How transforming an electronic rehabilitation record can contribute to value based health care, November 12, 2021, 11:00 AM - 12:00 PM

Title:
How transforming an electronic rehabilitation record can contribute to value based health care.

Learning objectives:
Sharing a vision how data of medical records combined with personal health data can contribute to value based health care.

This mini symposium presents vision statements of VWS (Dutch ministry of Health), the RVS (council of public health) and two progressive rehabilitation centres in the Netherlands on this topic.

Learn how patient centric thinking changes the rules of the game!

Outline
An electronic rehabilitation record (e-RR) is the modern variant of a patient's chart. The ownership of the e-RR lies in the rehabilitation centre or hospital. Only a small part of medical data are shared with patients or other health care providers. An electronic personal health record (e-PHR) is owned by the patient himself and contains health information derived from multiple sources (like health records, own e-health apps, wearables and health devices). In theory, merging the e-RR with the patient's e-PHR provides promising possibilities for analysing data to more relevant information for both healthcare providers and patients.
It is to be expected that, using an e-PHR, patient care and health outcomes will improve, without unwanted privacy aspects.

Also, with an e-PHR, long term follow up and monitoring on patients progress and wellbeing can be realised without unnecessary visits to outdoor patient clinics. Self-reliance of patients will increase when patients really own their medical data, leading to better-informed decision making.
These developments help in realizing more patient centred health care, that is efficient and less costly.
In the long run artificial intelligence might help to better understand the relation between treatment protocol and patient outcome for various patient groups and the ability to adapt treatment accordingly.

It is clear that VWS is stimulating healthcare institutes and hospitals with all kinds of tools to move into this direction. It is up to the healthcare sector to embrace this vision and realise it. However, the way forward is a bumpy road.

Hosted by a professional journalist known from television news items, in this webinar the audience is invited to discuss the different views on this topic with VWS and RVS together with frontrunners in the rehabilitation sector how to realise this together and set an example in Dutch Healthcare.

For all, rehabilitation is positioned as an unique position between cure and care, with motivated patients who are driven to pick up their life again in a new setting, using all data and tools that are given to them, including e-health.

Chairman: P.H. Goossens (RvB Merem en revalidatiearts)

Speakers:
F. Eefting (Voorzitter RvB Vogellanden) and S. van Vegten, (voorzitter RvB Merem): a new rehabilitation health care record. A vision on patient centred care.
M. Collombon (Aratame, Asterisque): New possibilities in health care record systems.
E. Gerritsen (SG ministerie VWS): Digital presence: The national vision on future health care records.

D5. Boosting Performance With High-End Interactive Gait Rehabilitation Technology

Dr. Maarten Prins[1], Dr. Noel Keijsers[2], Eline Zwijgers[2], Dr. Anke van Bladel[3,4], Dr. Juha Hijmans[5], Marissa Gerards[6,7,8], Ilona de Rooij[9,10]

[1]Military Rehabilitation Center, dept. Research & Development, [2]Sint Maartenskliniek, dept. Research & Innovation, [3]Ghent University Hospital, [4]Ghent University, Dept Rehabilitation Sciences, [5]Groningen University Medical Center, Dept. Rehabilitation, [6]Care and Public Health Research Institute CAPHRI, Department of Epidemiology, [7]Maastricht University, NUTRIM School of Nutrition and Translational Research in Metabolism, Department of Nutrition and Movement Sciences, [8]Maastricht University Medical Centre, Dept of Physical Therapy, [9]Revant Rehabilitation Centres, [10]Center of Excellence for Rehabilitation Medicine, UMC Utrecht Brain Center, University Medical Center Utrecht, and De Hoogstraat Rehabilitation

D5. Mini-symposium: Boosting Performance With High-End Interactive Gait Rehabilitation Technology, November 12, 2021, 11:00 AM - 12:00 PM

SESSION DESCRIPTION:

Description:
In the past decade, the use of high-end gait rehabilitation technology has increased rapidly. From a global perspective, the density of these high-end systems is exceptionally high in the BeNeLux. This cultural, linguistic and spatial proximity between sites facilitates collaborations which in turn accelerates the development of interventions. During this session, Dutch and Belgian members of the HEIGaRT (High-End Interactive Gait Rehabilitaton Technology) User Group will present how these systems are used to boost performance in patients and healthy individuals.

Objectives:
- Give an overview of the possibilities of high-end interactive gait rehabilitation technology
- Present the results of intervention studies that aimed to enhance performance in stroke patients, patients with incomplete spinal cord injury and patients with running related injuries
- Discuss the advantages and disadvantages of these interventions compared to conventional interventions

CHAIRS/PRESENTERS:

Chairs:
Dr. Maarten Prins (Military Rehabilitation Center), chair of the HEIGaRT usergroup
Dr. Noël Keijsers (Maartenskliniek), senior member of the HEIGaRT user group

Presenters:
Anke van Bladel (Ghent University Hospital).
Full body movement analysis of stroke patients when walking on a self-paced treadmill.
Ilona de Rooij (Revant).
Walking ability in relation to participation after stroke. Is there a role for virtual reality?
Eline Zwijgers (Maartenskliniek).
Walking adaptability training compared to endurance-and-resistance training in people with incomplete spinal cord injury.
Juha Hijmans (Groningen University Medical Center).
Gait retraining in running related injuries.
Marissa Gerards (Maastricht University Medical Center).
Perturbation-based balance training to improve balance control and reduce falls in older adults.

OUTLINE SESSION:

Outline:
An ongoing debate about the usage of instrumented treadmills has been the effect of this technology on the walking pattern. This argument has been settled for healthy individuals and children with Cerebral Palsy, supporting the use of the technology. Anke van Bladel will discuss the findings of a recent study to evaluate this effect on a considerably older population after stroke. Ilona de Rooij will present an overview of her PhD in which she examined feasibility and effect of virtual reality gait training on walking ability and participation in people after stroke and provides implications for clinical practice. Eline Zwijgers will present the results of an RCT in which she studied the effect of walking adaptability training on a GRAIL-system on walking capacity, functional ambulation, and participation in patients with incomplete spineal cord injury, compared to endurance-and-resistance training. Juha Hijmans will demonstrate how real-time feedback can be used to normalize atypical eversion of the rearfoot during running, which is a known risk factor for running-related injuries. Marissa Gerards will present the results of an RCT in which a CAREN-system was used for perturbation based balance training in older adults to reduce falls.

Programme:

11:00 – 11:05 Noël Keijsers and Maarten Prins: Welcome
11:05 – 11:15 Anke van Bladel: Full body movement analysis of stroke patients when walking on a self-paced treadmill.
11:15 – 11:25 Ilona de Rooij: Walking in relation to participation after stroke; is virtual reality training of added value?
11:25 – 11:35 Eline Zwijgers: Walking adaptability training compared to endurance-and-resistance training in people with incomplete spinal cord injury.
11:35 – 11:45 Juha Hijmans: Gait retraining in running related injuries.
11:45 – 11:55 Marissa Gerards: Perturbation-based balance training to improve balance control and reduce falls in older adults.
11:55 – 12:00 Wrap up

D6. Cochrane Rehabilitation: making a difference to the world of Rehabilitation

PhD Fieke Sophia Koopman[1], MD Carlotte Kiekens[2], Prof Stefano Negrini[3,4], MD, PhD Judith Vloothuis[5], Prof Maurits van Tulder[6]

[1]Department of Rehabilitation Medicine, Amsterdam UMC, [2]Montecatone Rehabilitation Institute, [3]Department of Biomedical, Surgical and Dental Sciences, University La Statale, [4]IRCCS Istituto Ortopedico Galeazzi, [5]Amsterdam Rehabilitation Research Centre, Reade, [6]Faculty of Behavioural and Movement Sciences, Vrije Universiteit Amsterdam

D6. Mini-symposium: Cochrane Rehabilitation: making a difference to the world of Rehabilitation, November 12, 2021, 11:00 AM - 12:00 PM

Cochrane Rehabilitation is a Field formally approved by Cochrane on October 22nd, 2016. Cochrane Rehabilitation serves as a bridge between Cochrane and all Rehabilitation stakeholders. On one side, it drives evidence and methods developed by Cochrane to the world of Rehabilitation, and on the other, it conveys priorities, needs and specificities of Rehabilitation back to Cochrane.
Cochrane Rehabilitation recognizes strengthening the methodology relevant to evidence-based clinical practice as one of its main goals. The need to improve the quality of conduct and reporting in rehabilitation research has been highlighted by several Cochrane Rehabilitation research activities. For example, issues such as low replicability of randomized controlled trials and desired items relevant in reporting have been underlined in a scoping review, a research study and two reviews. To answer to these needs, Cochrane Rehabilitation has launched the Randomized Controlled Trial Rehabilitation Checklists (RCTRACK) project aimed at producing a specific reporting guideline in rehabilitation.
This project and other interesting Cochrane Rehabilitation projects will be presented and the mission and working areas of the Cochrane Rehabilitation will be outlined in this mini-symposium. Two Cochrane authors of Cochrane systematic reviews will present their work and share their experience of writing Cochrane Systematic Reviews.

Programme
Session chair: Fieke Sophia Koopman, MD, PhD (Cochrane Review author)

Mission and working areas of Cochrane Rehabilitation
Carlotte Kiekens, MD (Co-Director Cochrane Rehabilitation)
Montecatone Rehabilitation Institute, Imola (Bologna), Italy

Cochrane Rehabilitation's special projects
Prof. Stefano Negrini, MD (Director Cochrane Rehabilitation)
Department of Biomedical, Surgical and Dental Sciences, University La Statale, Milano, Italy.
IRCCS Istituto Ortopedico Galeazzi, Milano, Italy

The impact of Cochrane Rehabilitation Reviews (1): caregiver-mediated exercises for improving outcomes after stroke
Judith Vloothuis, MD, PhD (Cochrane Review author)
Amsterdam Rehabilitation Research Centre, Reade, Amsterdam, The Netherlands

The impact of Cochrane Rehabilitation Reviews (2): twenty five Cochrane reviews on Low Back Pain
Prof. Maurits van Tulder (Cochrane Review author since 1996)
Faculty of Behavioural and Movement Sciences, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

Objectives:

1. To learn more about the mission and working areas of Cochrane Rehabilitation
2. To gain insight into a selection of special Cochrane Rehabilitation projects
3. To learn about the impact of Cochrane Rehabilitation Reviews and share experiences with the Cochrane authors

D7. Hanky, panky .... tDCS

Prof. dr. Gerard Ribbers[1], dr. Ruud Selles[1], MSc Joris van der Cruijssen[1], MD Zeb Jonker[1], MD. PhD Rick van der Vliet[1]
[1]*Erasmus Mc*

D7. Mini-symposium: Hanky, panky .... tDCS, November 12, 2021, 11:00 AM - 12:00 PM

tDCS is a form of non-invasive neurostimulation that delivers a low electrical current to the brain through the use of electrodes placed on the scalp. It is considered to inhibit or excite neural activity, and to improve neuroplasticity. We have performed some the largest RCTs ever to examine the effects of tDCS on recovery after stroke with aphasia and motor performance as primary outcomes but failed to establish any effect. In depth analysis failed to identify subpopulations that might be responsive to tDCS. We examined whether the montage of the electrodes could be personalized, whether cerebellar stimulation might have a positive effect via the cerebellar-frontal loops and whether we could measure any effect on cortical excitability with tMS in 4 successive PhD projects. In this minisymposium we will summarize our research on tDCS to conclude that we found little support that it actually enhances brain performance.

D8. Rehabilitation and technology: innovating and co-creating with colleagues and clients

Dr. Henk Seelen[1,2], Drs. Jule Elmanowski[1,2], Dr. Barbara Piskur[3], Dr. Eva Geurts[4], Dr. gustavo roveloruiz[4]
[1]Adelante Zorggroep, [2]Maastricht University, [3]University of applied sciences Zuyd, [4]Hasselt University

D8. Mini-symposium: Rehabilitation and technology: innovating and co-creating with colleagues and clients,
November 12, 2021, 11:00 AM - 12:00 PM

The possibilities and added value of new technologies in rehabilitation are numerous. However, many new developments eventually do not reach our rehabilitation teams or patients. Often, newly developed technology does not fit because it is not tested with patients; not useful for the indicated purpose or target group; or possibly even harmful. Technology development within the context of and in close collaboration with rehabilitation practice is therefore important.

To facilitate the development and implementation of rehabilitation technology within the context of rehabilitation care, the consortium i2-CoRT (www.i2-CoRT.eu) was set up. I2-CoRT stands for Innovation and Implementation acceleration for Complex Rehabilitation Technology. The consortium facilitates international collaboration between rehabilitation centres, knowledge centres, (SME) businesses, health care and patients organizations in the Netherlands, Belgium and Germany, and was funded by the Interreg V-A Euregion Meuse-Rhine program of the European Union.

In this mini-symposium new developments by the I2-cort consortium in robot and sensor technology-assisted arm-hand rehabilitation, virtual reality and 3D-printing will be shown.

Learning objectives:

- To learn about the concept of a clinical rehabilitation test centre, developed to facilitate the development and implementation of rehabilitation technology within rehabilitation practice;
- To learn about new technology-assisted rehabilitation approaches that have been developed in the i2-CoRT context, including the treatment concepts behind them;
- To reflect on future developments and challenges in rehabilitation medicine to secure excellent care to clients, and reflect on lessons learned during the i2-CoRT project.

Chair of session: Dr. Henk Seelen

Titles and speakers:
"The i2-CoRT test centre concept";
Dr. Henk Seelen, Adelante Zorggroep / Maastricht University:

"ReHab-TOAT: Task-Oriented Arm Training using nuclear energy reactor technology",
Drs. Jule Elmanowski, Adelante Zorggroep / Maastricht University:

"Designing and development of a robot-assisted rehabilitation software: Converting patients' and therapists' needs"
Gustavo.Rovelo-Ruiz, Hasselt University, Belgium
Eva Geurts, Hasselt University, Belgium

"VR and 3D printing opportunities: Co-creating (bespoke) patient rehabilitation technology"
Dr. Barbara Piskur, Zuyd University of Applied Sciences:

Poster presentaties

Top 8 posters

P1. The effect of robotic enhanced error training on arm function in people after stroke - Sanne Ettema
P2. Making of a mixed reality patient education intervention for patients with spinal cord injury - Joost Baardman
P3. Is the wheelchair ergometer of added value in adjustments for manual wheelchair use? - Esther Schutte
P4. Outcome registry of Early Intensive Neurorehabilitation in patients with Disorders of Consciousness: design of the DOCTOR study - Daniëlle Driessen
P5. Central recovery after peripheral nerve damage in neuralgic amyotrophy, a randomized controlled trial (RCT) - Renee Lustenhouwer
P6. Effectiveness of an outpatient multidisciplinary rehabilitation program in patients with neuralgic amyotrophy: a randomized controlled trial (RCT) - Renske MJ Janssen
P7. Evaluating Communication Partner Training (CPT) in healthcare centers - Maren van Rijssen
P8. The mini-bestest reactive balance score: discriminative capacity and concurrent validity in the chronic phase after a minor stroke - Rick van Damme

Overige posters

P9. RYSEN: an innovative robotic system enabling early intensive gait training during rehabilitation - Sanne Ettema
P10. Possibilities of using the Rollz Motion Smart for gait analysis in rehabilitation for stroke patients - Monique Berger
P11. A LivingLab to develop New Interventions in a Clinical Environment for Active Living and Lifestyle (NICE4ALL) - Klaasjan van Haastrecht
P12. The Abel_pro 2.0: an eHealth solution for the network rehabilitation process - Arne Goedhart
P13. Hololearn; Mixed Reality Scenario Based e-learning voor revaliderend werken - Anne de Rooij
P14. Natural history, Outcome measures and Trial Readiness in LAMA2-related muscular dystrophy and SELENON-related myopathy in children and adults: protocol of the LAST STRONG study - Karlijn Bouman
P15. PERRIN Next Step: Better Together from Knowledge to Active practice - Maureen Bult - Mulder
P16. Optimizing the provision process of dynamic arm supports and robotic arms:development of an optimized procedure for the provision - Loek van der Heide
P18. Exploring acquired childhood aphasia; a Dutch registry - Femke Nouwens
P19. An innovative intervention to cope with and self-manage long-term

consequences of cerebral palsy at adult age - Jenneke de Jager-Kievit
P20. Determining the smallest detectable change in wheelchair ergometer outcomes during propulsion wheelchair tests - Kim van Hutten
P21. Limitations in activities and participation experienced by individuals with chronic inflammatory demyelinating polyneuropathy and multifocal motor neuropathy - Henderyke Wonink
P22. *Vervallen*
P23. Physical recovery up to 12 months after hospitalization for COVID-19; results from the multicenter prospective CO-FLOW study - Julia Berentschot
P24. The needs regarding telemedicine of informal caregivers of stroke patients during rehabilitation: A qualitative study - Esther Rakhorst
P25. Changes in fear of movement in patients attending cardiac rehabilitation: responsiveness of the TSK-NL Heart - N ter Hoeve
P26. Determining the difference between wheelchair adaptations, i.e. hand rim types, by using propulsion wheelchair tests on a wheelchair ergometer - Melle Van Dilgt
P27. Patients' and caregivers' preferences regarding a rehabilitation program aimed at fatigue after aneurysmal subarachnoid haemorrhage - Lieke Gijsbers
P28. Inertial measurement unit instrumented tests to evaluate gait during stroke rehabilitation: test-retest reliability - Richard Felius
P29. Effective bowel management in Spinal Cord Injury during inpatient rehabilitation: Data from the Dutch Spinal Cord Injury Database - Nikki van der Veldt
P30. The effects of an interdisciplinary rehabilitation program in patients following covid-19 infection: an observational study in an outpatient setting - Annemarijne Holl
P31. Cognitive functioning, fatigue, and psychological outcomes up to 12 months after hospitalization for COVID-19 - Martine Bek
P32. Augmented rehab: using mixed reality in spinal cord injury rehabilitation – a pilot study - Joost Baardman
P33. The effect of AFO-tuning on gait in children with cerebral palsy - Saskia Dianne Roerink
P34. Effectiveness of Innovative Interventions for Cognitive Rehabilitation in Children with ABI, in Conjunction with a Serious Game - Charlotte Southcombe
P35. Changes in bladder management during first inpatient rehabilitation after spinal cord injury and determining factors: Data from the Dutch Spinal Cord Injury Database - Claire Poublon
P36. Martial arts training for boys with Duchenne Muscular Dystrophy A feasibility study - Maarten Stessel
P37. An innovative care pathway for botulinum toxin treatment - Marije Vos-van der Hulst
P38. The course of pain in stroke patients receiving rehabilitation - Winke van Meijeren-Pont

P39. Faecal microbiota in patients with neurogenic bowel dysfunction and spinal cord injury or multiple sclerosis - a systematic review - Willemijn Faber
P40. Pain in Spinal Cord Injury During Initial Inpatient Rehabilitation: Data from the Dutch Spinal Cord Injury Database - Tim Crul
P41. Information needs and preferences in ALS patients in the Netherlands - M. Sloots
P42. Real-time assessment of fatigue reveals that fatigue after subarachnoid haemorrhage is not static but varies within and between days - Elisabeth de Vries
P43. Cardiac rehabilitation for patients with obesity: results of the OPTICARE XL RCT on health-related quality of life, fatigue and participation in society - Iris den Uijl
P44. Recovery of functional mobility and lower limb function during the first 3 months post-stroke in patients with visuospatial neglect: Preliminary results of a longitudinal cohort study - Elissa Embrechts
P45. A clinical perspective on functional problems in adults with cerebral palsy, with respect to, intellectual and walking disability; preparing an ICF Core Set for adults with CP - Fay Visser
P46. 4PM&R: Stay informed about scientific rehabilitation research - Wouter Vints
P47. The longitudinal association between movement behavior patterns and the course of participation in people with stroke up to one year after discharge to the home setting - Joris de Graaf
P48. De Huidige Knelpunten in de Zorg voor Neuromusculaire Aandoeningen in Relatie tot een Netwerk: Een Kwantitatieve Studie - Ronne Pater
P49. Differences in quality of life between Europeans and non-Europeans in a Dutch hospital based stroke population - Sjoerd Timo Auwerda
P50. Measuring of trans-tibial residual limb volume - Z. Grootkarzijn
P51. The use of the Withings Pulse HR smartwatch in a cardiac rehabilitation program - Liesbeth Van Der Wal
P52. Fatigue among young patients with acquired brain injury in the rehabilitation setting: interpreting and categorizing fatigue severity levels - Florian Allonsius
P53. Serious Gaming: What are the Possibilities for Innovative Cognitive Diagnostics in Children with Congenital Heart Disease? - Charlotte Southcombe
P54. Beter zorg dragen voor je eigen medicatie begint bij (revalidatie)verpleegkundigen Bachelor of Nursing - Femke Nabbe
P55. Rehabilitation after COVID-19: A short report - Roel Straathof
P56. Discussing personalized prognosis of survival in amyotrophic lateral sclerosis: A qualitative study of patients, caregivers, and physicians - Remko van Eenennaam
P57. Outcomes that matter to children and youth with a disorder of head, brain or senses - Myrna Heydenrijk-Kikkert
P58. Focus groups study on the facilitators and barriers in wearing therapeutic footwear in different subgroups of Diabetic patients with loss of protective sensation - Athra Malki

P59. Self-efficacy training in persons with SCI - Christel Van Leeuwen
P60. Revalideren is Leren, óók voor zorgprofessionals.Wat zijn de ervaringen, wensen en behoeften van zorgprofessionals? - Laura Jongmans
P61. Revalideren is leren is voor iedereen - Angelique Bastiaans
P62. Cognitive assessment in a digital era: current state-of-art in neuropsychological outcome measures - Eileen Bousché
P63. Trends in defining and distinguishing virtual reality in post-stroke rehabilitation - Hanne Huygelier

P01

The effect of robotic enhanced error training on arm function in people after stroke

Drs. Sanne Ettema[1], Dr. Melvyn Roerdink[2], Prof. Dr. Han Houdijk[3], Dr. Janneke Nachtegaal[1], Prof. Dr. Coen van Bennekom[1,4]
[1]Heliomare Research and Development, [2]Department of Human Movement Sciences, Faculty of Behavioral and Movement Sciences, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, [3]University of Groningen, University Medical Center Groningen, Center for Human Movement Sciences, [4]Coronel Institute of Occupational Health, Academic Medical Center, University of Amsterdam

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Topic
People after stroke often show reduced functionality of their paretic arm. Despite the development of several treatment methods, full recovery of arm function is often not achieved in many patients, especially not in those who are severely affected. Therefore, Heliomare rehabilitation center aims to investigate the effectiveness of a new robotic system (DeXtreme, BioXtreme LTD, Israel) on improving severely affected arm function after stroke.

Relevance
The DeXtreme is a robotic arm including a force sensor and virtual reality feedback screen that can augment movement errors during reaching tasks. This is believed to make errors more perceptible, thus enhancing movement correction. It is expected that DeXtreme enhanced error training can improve arm function after stroke due to stimulation of motor learning processes.

Current status
A protocol for a randomized controlled trial has been developed. Two groups of stroke patients will receive two weeks of DeXtreme robotic training as adjunct to usual care, with three 20-minute sessions per week. One group will perform regular reaching tasks using the DeXtreme without error enhancement, whereas the other group will perform reaching tasks with augmentation of movement errors. Scores on Action Research Arm Test, Fugl-Meyer and Motor Assessment Scale will be compared between groups before and after the training period, as well as training performance and experience.

Plan of action
We will use the results of our RCT study to decide whether this specific type of training should be implemented in usual care of rehabilitation centers to improve severely affected arm function after stroke.

P02

Making of a mixed reality patient education intervention for patients with spinal cord injury

MD JF (Joost) Baardman[1], PT MSc J (Joep) Janssen[1,2], JJ (Anneke) Collet[3], BSc K (Klaas) Wit[3], PT PhD SA (Sacha) van Langeveld[1], MD PhD JM (Janneke) Stolwijk-Swüste[1]
[1]Rehabilitation Centre De Hoogstraat, [2]Holomoves, [3]Patient expert

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction
The human body is complex to understand, imagine the challenge for patients with spinal cord injury to understand the consequences of the injury to their bodies. Effective counselling is essential for long-term health. Conventional education methods, however, have barriers. Interactive patient education interventions using Mixed Reality (MR) strengthen knowledge transfers with three-dimensional human-like visuals (holograms) and can be used at a convenient time for the patient and its caregiver.

Methods
Authors created the first MR patient education app explaining the basic consequences of a spinal cord injury, focusing on locomotion, sensation, organ function and autonomic changes. In this process, patients, rehabilitation therapists and physicians were involved to determine the requirements of effective MR patient education. An iterative development process in cooperation with an MR software developer followed.

Results and discussion
10 patients and 8 rehabilitation professionals were interviewed to determine requirements about the content, visual aspects and usability of the app. An interactive hologram to visualize the injury and its primary consequences was created in MR and supported by textual and auditory explanations. The first experiences of patients in a pilot study are promising. Furthermore, there is potential for expansion (for example adding detailed modules about consequences for neurogenic bladder problems).

Conclusions
Patients and professionals believe that interactive, visually supported patient education interventions using MR are beneficial in the knowledge transfer in the subacute inpatient rehabilitation period after spinal cord injuries. MR can offer this. The next step is to evaluate it in daily practice and to expand it.

P03

Is the wheelchair ergometer of added value in adjustments for manual wheelchair use?

MD Esther Schutte[1], MSc K. van Hutten[1], MSc M. van Dilgt[,2], MD F. Harberts[1], PhD M.A.M. Berger[1,2]
[1]Basalt, [2]The Hague University of Applied Sciences

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Topic:
Creating a wheelchair propulsion lab to contribute with objective data in advising wheelchair adjustments, propulsion technique and physical training. The wheelchair ergometer (Lode, Esseda) is used and patients are measured with their own manual wheelchair for daily use, with or without electric support.

Relevance:
Wheelchair adjustments are mainly based on expert opinion, obtained from observation in passive position. To contribute to the advice for all clinicians involved in the process of training, prescribing or adapting a wheelchair, we aim to add objective propulsion data to analyze the interface of user and wheelchair in action. A well-adjusted wheelchair can contribute to an active lifestyle, avoiding overload and maximal participation in society.

Current status:
Protocol consisted of 30s sprint, driving at comfortable speed and maintaining given constant speed. Outcome parameters are max and mean power, speed and force; push frequency; right-left asymmetry; contact time on rim; cycle duration. Video and pictures from left lateral side and backside are obtained to analyze symmetric position and upper body movement during drive. Eleven patients were measured, some repeated after adjustments.
Wheelchair ergometer is of most added value to referral questions related to efficiency. For example:
- Can sprint capacity be improved?
- Pain in upper extremity: indications for overload?
- Adding electrical support?
- Asymmetry in propulsion?

Plan of action:
To gain more knowledge about the individual efficiency of the wheelchair user we aim to add the cardiopulmonary exercise test. For the interface we plan to use the wheelchair ergometer for training.

P04

Outcome registry of Early Intensive Neurorehabilitation in patients with Disorders of Consciousness: design of the DOCTOR study.

Drs. Danielle Driessen[1,2], PhD Cecile Utens[1,2], Prof (MD) PhD Gerard Ribbers[2,3], MD PhD Willemijn van Erp[1,4,5], PhD Majanka Heijenbrok-Kal[2,3]

[1]Libra, Rehabilitation & Audiology, [2]Department of Rehabilitation Medicine, Erasmus MC, [3]Rijndam Rehabilitation, [4]Radboud University Medical Centre, [5]Accolade Zorg

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Approval of Medical Ethical committee of Erasmus MC Rotterdam (Reference number MEC-2019-0127).

Prolonged disorders of consciousness (PDOC) may occur after severe brain injury. Patients with PDOC may benefit from early intensive neurorehabilitation (EIN), available for patients >25 years since January 2019. In the Netherlands, the EIN programme is provided by one rehabilitation centre (Libra Rehabilitation, location Leijpark) and forms the starting point of a dedicated chain of specialised rehabilitation and care.

What are the short- and long-term outcomes of patients with PDOC who receive EIN?

DOCTOR is a cohort study with a 2-year follow-up period, including patients aged ≥16 years and have PDOC due to acute brain injury. At least 72 patients will be included. Outcomes that are measured are 1) the changes in level of consciousness over time; 2) the frequency and type of medical complications; 3) mortality; 4) level of disability, 5) including the level of motor, cognitive, behavioural and emotional functioning; 6) participation; 7) quality of life; 8) self-efficacy of informal caregivers and informal caregivers' strain; and 9) cost-effectiveness of the programme. Measurements will take place at start EIN, in week 5, 10, and at discharge from EIN and at 4 time points over 2 years.

This study will provide insight in the recovery patterns and predictors of recovery for multiple outcomes in PDOC patients following EIN. The results of the study will enable us to benchmark and improve EIN and the organisation of the health-care chain, both for patients with PDOC and for their families.

P05

Central recovery after peripheral nerve damage in neuralgic amyotrophy, a randomized controlled trial (RCT)

drs. Renee Lustenhouwer[1,2], dr. Ian Cameron[2,3,4], dr. Nens van Alfen[5], prof. dr. Ivan Tony[2], prof. dr. Sander Geurts[1], prof. dr. Baziel van Engelen[5], dr. Rick Helmich[2,5], Dr. Jan Groothuis[1]

[1]Department of Rehabilitation, Radboud university medical center, Donders Institute for Brain, Cognition and Behavior, [2]Donders Centre for Cognitive Neuroimaging, Donders Institute for Brain, Cognition and Behavior, Radboud University, [3]Donders Centre for Neuroscience, Donders Institute for Brain, Cognition and Behavior, Radboud University, [4]Faculty of Electrical Engineering, Mathematics and Computer Science, University of Twente, [5]Department of Neurology, Radboud university medical center, Donders Institute for Brain, Cognition and Behavior

Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction

Neuralgic amyotrophy is a common peripheral nerve disorder caused by auto-immune inflammation of the brachial plexus, clinically characterized by acute pain and weakness of the shoulder muscles, followed by motor impairment. Recently, we have empirically confirmed the clinical suspicion that NA patients with residual motor dysfunction have abnormal central sensorimotor representations related to their affected limb and residual symptoms.

Objective

to determine whether the cerebral abnormalities associated with NA can be normalized through specialized rehabilitation focused on relearning motor control, as compared to usual care.

Patients

27 neuralgic amyotrophy patients with persistent, lateralized symptoms in the right upper extremity

Methods

A randomized controlled trial, comparing specialized rehabilitation (n=16) to usual care (n=11). We used task-based functional MRI and a hand laterality judgment task, which involves motor imagery and is sensitive to sensorimotor cerebral changes in neuralgic amyotrophy.

Results

Overall, neuralgic amyotrophy patients had improved task performance and increased activity in visuomotor occipito-parietal brain areas at follow-up compared to baseline during motor imagery. Although patients in the specialized rehabilitation group showed greater improvement in clinical outcome than patients in the usual care group, there were no significant group differences in change in behavioral task performance or related brain activity.

Discussion and conclusions

The results indicate that cerebral sensorimotor abnormalities after peripheral nerve damage in neuralgic amyotrophy are amendable to treatment. And specialized rehabilitation may facilitate recovery in neuralgic amyotrophy patients.

Clinical message

Rehabilitation interventions that apply visuomotor strategies to improve sensorimotor integration may help to treat neuralgic amyotrophy patients.

P06

Effectiveness of an outpatient multidisciplinary rehabilitation program in patients with neuralgic amyotrophy: a randomized controlled trial (RCT).

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Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction: Patients with neuralgic amyotrophy (NA) often experience severe upper extremity (UE) pain and paresis, fatigue, and limitations in UE functioning. Functional recovery is usually slow and often incomplete. We designed an outpatient multidisciplinary rehabilitation program specifically for patients with NA aimed at relearning motor control and self-management strategies.

Objective: To assess the effect of an outpatient multidisciplinary rehabilitation program, consisting of self-management strategies and regaining motor control, compared to usual care in patients with NA to minimize long-term complaints and disabilities.

Patients: Forty-seven patients (18 women) with right-sided brachial plexus NA (mean age 43.6 ± 12.10 years).

Methods: Single-center RCT, in which patients were randomized into an intervention or control (usual care) group and followed over a period of 17 weeks. Primary outcome was the Shoulder Rating Questionnaire (SRQ), measuring functional UE capacity. Secondary outcomes included measures of pain, fatigue, participation, reachable workspace and UE muscle strength. ANCOVA was used for analysis with correction for SRQ baseline, sex and age.

Results: We found a significantly larger SRQ improvement in the intervention compared to the control group ($F(1,35)= 4,41$, $p = .044$). Analysis of secondary outcomes is ongoing.

Discussion: Our results demonstrate the effectiveness of an outpatient multidisciplinary rehabilitation program to improve UE motor control and daily functioning in patients with NA.

Clinical message: Patients with long-term disability and pain after brachial plexus NA may benefit from a targeted outpatient multidisciplinary rehabilitation program using self-management strategies.

P07

Evaluating Communication Partner Training (CPT) in healthcare centers

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Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction
About one third of people who suffer a stroke acquire aphasia, a language disorder. People with aphasia often face the inaccessibility of communicating with their healthcare professionals (HCP). Communication between people with aphasia and HCP can be greatly improved when HCP receive Communication Partner Training (CPT) and learn to use a more inclusive communication style.
Objective
The objective of this multi-center implementation project was to identify the mechanisms that facilitate or build up barriers for HCP to use a more inclusive communication style after CPT.
Methods
An explorative qualitative research design was chosen and semi-structured interviews were used to collect the data. The CPT intervention 'CommuniCare' was implemented in five healthcare centres. 254 HCP were trained to use supportive conversation techniques. 24 HCP participated in interviews.
Results
Three themes were identified to describe HCPs' perspectives on the mechanisms that led to the use of supportive conversation techniques after Communicare. The remaining findings show HCPs' perspectives on the barriers to use supportive conversation techniques.
Discussion and conclusions
The data in this study were used to inform the development of setting specific implementation plans to continue the use of an inclusive communication style in healthcare settings. In this presentation we will show how healthcare settings can enhance the communication skills of their HCP.
Clinical message
Healthcare settings wishing to enhance HCPs' communication skills should first consider enhancing HCPs' opportunities for experiential learning. Second, healthcare settings should consider appointing implementation support practitioners. These two points will be explained further in our presentation.

P08

The mini-bestest reactive balance score: discriminative capacity and concurrent validity in the chronic phase after a minor stroke

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Poster pitches top 8 posters / poster sessie, November 11, 2021, 1:35 PM - 1:50 PM

Introduction
Reactive stepping is an important saving strategy to prevent falling. Lab-based studies showed pronounced deficits in reactive stepping capacity after stroke. Here, we tested whether the reactive postural control subtest of the Mini-BESTest (MBT-RPCS) is a valid clinical alternative.

Objective
To investigate:1) discriminative capacity of the MBT-RPCS between minor stroke patients and healthy controls,
2) concurrent validity of the MBT-RPCS against a 'gold standard' lab-based reactive stepping test.

Participants
We included 75 participants in the chronic phase after minor stroke, defined as (near-) full recovery on Fugl-Meyer Assessment–Lower extremity (score≥24). Healthy individuals (n=51) served as controls.

Methods
Participants underwent two tests for reactive stepping capacity. The MBT-RPCS assessed stepping responses following manually-delivered perturbations. The lab-based stepping test included standardized perturbations (backwards and towards paretic side) of increasing intensity using an adjusted treadmill. Main outcome was the multiple stepping threshold (MST). Discriminative capacity was determined by ANCOVA, with age as a covariate. Concurrent validity was determined with Kendall's Tau-b correlation coefficients (τb).

Results
MBT-RPCS sum score was significantly lower in the minor stroke group versus controls, $F(1,123)=4.428$, $p=0.037$. No significant correlations were found between MBT-RPCS and MST in the minor stroke group ($\tau b \leq 0.075$).

Discussion and conclusions
The MBT-RPCS shows good discriminative capacity. However, absence of correlation with the 'gold standard' indicates MBT-RPCS might not reflect the true reactive balance capacity of minor stroke patients.

Clinical message
The MBT-RPCS may be used for the screening for reactive stepping capacity in minor stroke patients in clinical settings. Validity might improve by standardization.

P09

RYSEN: an innovative robotic system enabling early intensive gait training during rehabilitation

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic
Rehabilitation programs often focus on regaining safe gait in compliance with motor learning principles. Evidence supports the benefits of intensive, repetitive and task-specific gait training early during rehabilitation. However, early gait training is often limited in frequency and duration, as certain levels of muscle strength, balance and coordination are required to start walking. The recent introduction of the RYSEN 3D body weight support (BWS) system holds promise to facilitate intensive and task-specific training early during rehabilitation.

Relevance
The RYSEN is an innovative BWS system that enables freedom of movement in all directions without disturbing natural gait. Patients who cannot bear their body weight and require full therapeutic assistance can now safely practice independent walking. Moreover, the RYSEN allows for task-specific training, with assistance as needed, due to a range of features (e.g. adjustable BWS, lateral stabilization, horizontal forces). This may promote optimal recovery while reducing therapeutic workload.

Current status
The RYSEN is implemented as part of daily treatment practice in Heliomare rehabilitation center for several disciplines, i.e. stroke, spinal cord injury and amputation. Weekly, 20-25 patients perform one hour of RYSEN training as adjunct to usual care.

Plan of action
Scientific research will be performed to compare RYSEN and conventional training, looking at training intensity, task-specificity and experiences. Moreover, the optimal application of RYSEN features will be investigated in cross-sectional studies as well as their contribution to improving gait. Outcomes will contribute to the development of training protocols and further implementation of the RYSEN.

P10

Possibilities of using the Rollz Motion Smart for gait analysis in rehabilitation for stroke patients

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic
The Rollz Smart Motion rollator detects posture, gait and activity of a user and provides feedback. This rollator includes various programs to train the user and optimize walking performance but can also be used for measuring gait analysis parameters like velocity, step time, step length, distance between person and rollator. Visible, tactile and auditory cues help the user to take the first step or maintain a suitable walking rhythm.

Relevance
Feedback on gait patterns can be given directly and indirectly while using the walking aid, assisting patients with mobility impacting disabilities and supporting professionals. This feedback can help in implementing and evaluating treatments to improve gait. It can also stimulate people to walk.

Current status
The Rollz Smart Motion rollator can monitor velocity, step length and time in a reliable and valid way. An app is being developed to give users feedback on outcome parameters as total distance walked, number of steps, duration of walking and speed. Different cues, especially for Parkinson patients, can be given during walking.

Plan of action
For optimal rehabilitation of the patient's gait pattern, it is important that feedback is given on parameters which are specifically relevant for the patient group involved. Choice of outcome parameters for different patient groups should be made. For the further development of the walking module, the developer and the users (patients and therapists) have to work very closely on the realization of the app and feedback cues. User group research has to be carried out in the future.

P11

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

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic
To support patients to attain a more active lifestyle during and after their rehabilitation treatment, a LivingLab was set up to provide appealing and challenging physical activities.

Relevance
An active lifestyle improves the outcomes of rehabilitation and helps to prevent health problems in the future. Our LivingLab provides a physical location to develop, test and evaluate innovations by means of action research, with a community of practice (CoP) in order to investigate what works best for a more active lifestyle in a real-life setting.

Current status
Our LivingLab, is a ±400 m2 multi-purpose, open space, at the heart of the building.
So far, we've achieved: development and implementation of various products/services that support an active lifestyle. Among those; a silent disco, smartclips and a stairs challenge and a meeting point with barista to attract more people. A CoP, supporting the action research process, with patients, students and lecturers, health professionals and other stakeholders has an active role from ideating to reporting and proved vital to the success of the project.

Plan of action
A manual has been written to assist rehabilitation researchers to execute action research and will be implemented. Our current focus is on reviewing what products work best to engage people. We will create a guideline for other locations of Basalt in selecting suitable products. Spin-offs to other areas include sporting facilities on our rooftop and design of a more activity friendly environment adjacent to our facility. Ideas on healthy food are forming and will be developed.

P12

The Abel_pro 2.0: an eHealth solution for the network rehabilitation process

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic: Development of a multi-exercise device with sensors for special target groups like people with standing and/or walking problem (e.g. elderly, patients with MS). Complemented with an analogue-digital environment in which therapist from secondary care and primary care can work together, with the patient, on an optimal and personalized training program but also safely store data.

Relevance: Network rehabilitation is difficult as professionals do not have direct insight in the outcomes outside the own organization. Using innovative and eHealth related techniques in the Abel_Pro, network rehabilitation process is possible.

Current status: In the first stage the Abel_pro was developed. It is an innovative, compact and mobile multi-exercise training device with several settings and support options for performing 5 different exercises to be used in care centers as well as in home situation. In addition, a digital training program was developed, which can be personalized for specific users. The Abel_pro was successfully tested in daily rehabilitation practice. Currently, the development process is in the second stage. During this stage different sensors for quantifying and qualifying movements are attached to the Abel_pro.

Plan of Action:
In the next stage an interactive dashboard will be developed. Measurement data from the sensors are transferred to the dashboard. Patients and their therapist both can control performance and implement new interventions through the dashboard. An automatic registration system will be developed enabling safe data-exchange with smart device and stored in a personal health environment (in Dutch PGO).

P13

Hololearn; Mixed Reality Scenario Based e-learning voor revaliderend werken

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Uit onderzoek is gebleken dat 65% van de patiënten volledig zelfstandig kan bewegen tijdens opname in het ziekenhuis. Desondanks brengen patiënten 90% van de tijd liggend en zittend door, waardoor functieverlies zoals achteruitgang in mobiliteit en ADL op de loer ligt. Zorgverleners hebben de neiging om zorg uit handen te nemen waardoor dit deels in stand wordt gehouden.
Hololearn is een mixed-reality scenario-based trainingsmodule over function-focused care die ontwikkeld is voor verpleegkundigen. Bij deze module wordt, naast een e-learning op de computer, gebruik gemaakt van een module op een hololens. Het doel van de module is om verpleging alert te maken op het belang van bewegen bij in het ziekenhuis opgenomen patiënten en hen de daarvoor benodigde vaardigheden aan te leren. Het typerende van Hololearn is dat deze vaardigheden met behulp van vooraf geprogrammeerde scenario's aangeleerd worden binnen de dagelijkse verpleegkundige handelingen zoals de ADL of een patiënt klaarmaken voor een onderzoek.
Aan de hand van semi-gestructureerde interviews met verpleegkundigen en brainstormsessies met de gehele projectgroep zijn leerdoelen, karakters en scenario's geschreven en is middels een iteratief proces de mixed-reality module op de hololens ontwikkeld.
Het doel is om de trainingsmodule aan de onderwijscyclus van verpleegkundigen toe te voegen. Tevens is de wens om middels een onderzoek de ervaring van gebruikers, de meerwaarde van MR en een evaluatie van de leerdoelen in kaart te brengen.

P14

Natural history, Outcome measures and Trial Readiness in LAMA2-related muscular dystrophy and SELENON-related myopathy in children and adults: protocol of the LAST STRONG study.

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SELENON (SEPN1)-related myopathy (SELENON-RM) is a rare congenital myopathy characterized by slowly progressive proximal muscle weakness, early onset rigidity of the spine and respiratory insufficiency. Muscular dystrophy caused by mutations in the LAMA2 gene (LAMA2-related muscular dystrophy, LAMA2-MD) has a similar clinical phenotype, with either a severe, early-onset (complete), or a mild, childhood- or adult-onset (partial laminin α2 deficiency). For both muscle diseases, no curative treatment options exist, yet promising preclinical studies are ongoing. Currently, there is a paucity on natural history data. Appropriate outcome measures are needed to reach trial readiness.
LAST STRONG is a natural history study in Dutch-speaking patients of all ages diagnosed with SELENON-RM or LAMA2-MD. Patients have four visits at our hospital over a period of 1.5 year. They will undergo a standardized neurological examination, hand-held dynamometry, functional measurements (motor function, balance, graded and timed function tests), questionnaires (Quality of Life, pain, fatigue, participation), muscle ultrasound including diaphragm, pulmonary function tests, cardiac evaluation, spine X-ray , dual-energy X-ray absorptiometry (DEXA-)scan, full body magnetic resonance imaging (MRI) and accelerometry, all adapted to the patient's age and functional abilities.
Our study will describe the natural history of patients diagnosed with SELENON-RM or LAMA2-MD, enabling us to select relevant clinical and functional outcome measures for reaching clinical trial-readiness. Moreover, our detailed description of the clinical features will optimize clinical management and will establish a well-characterized baseline cohort for prospective follow-up.

This study has been approved by Medical ethics committee Arnhem-Nijmegen (NL64269.091.17, 2017-3911) and is registered at ClinicalTrial.gov (NCT04478981).

P15

PERRIN Next Step: Better Together from Knowledge to Active practice

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Topic: In the research program PERRIN, children, adolescents and young adults with cerebral palsy (CP) have been followed longitudinally (0-35 years of age), focusing on the development of activities and participation. The research program has provided knowledge on developmental trajectories and determinants of activities and participation of children and youth with CP. The goal of PERRIN Next Step is to translate this knowledge into high quality tools enabling people to actively use the knowledge in daily life and clinical practice and facilitate Shared Decision Making (SDM).

Relevance:The longitudinal information about CP is unique. The tools and website that are being developed will be a reliable source for information for young people with CP, parents and healthcare professionals. The tools will be easy to use and can be customized to personal needs of the user and facilitate SDM.

Current status: Materials and tools are being developed in an iterative co-creation process with persons with CP, parents, healthcare professionals and researchers, with support of experts in visual and interaction design. A website is being developed facilitating personalized information including (printable) developmental curves for various developmental domains, background information, infographics and experience stories.

Plan of action: The co-creation process that has been initiated will include an advisory group consisting of persons with CP, parents and professional associations. They will provide feedback and advise in use of the tools for the people they represent. In 2022 the website will be launched.

P16

Optimizing the provision process of dynamic arm supports and robotic arms: development of an optimized procedure for the provision

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic: Provision process of dynamic arm supports and robotic arms

Relevance: Impaired upper extremity function due to muscle paresis or paralysis for example as a result of a (neuro)muscular disorder, has a major impact on independent living and QoL. Assistive technology (AT) for upper extremity function (i.e. dynamic arm supports and robotic arms) can increase independence. Previous studies revealed that patients often use these ATs not to their full potential, due to suboptimal provision.

Current status: A protocol describing the optimized provision process was developed in 6 interdisciplinary co-creation sessions (January 2020-March 2021). It was based on a generic Dutch guideline, consisting of 7 steps from “identifying of problem” to “evaluation”. This process resulted in an overview of barriers to solve including limited information about this type of AT, lack of skills in matching patient and AT, insufficient resources for training and support and the absence of structural evaluation. Solutions included vocational education of occupational therapists, allowing to change the AT in case it is not effective after careful consideration and training. Tools were developed supporting patients and professionals, including: instruments to match patients and AT, and digital information regarding ATs.

Plan of action: The protocol was implemented in June 2021 and subsequently we evaluate its cost-effectiveness. We aim to include 48 patients who receive care according to this protocol (intervention group). Effect is assessed by questionnaires relating to QoL and satisfaction. Outcomes are compared to collected data in 2019-2021 in a control group before the implementation of this protocol.

P18

Exploring acquired childhood aphasia; a Dutch registry

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Introduction: Acquired childhood aphasia (ACA), a language deficit due to brain damage, has severe consequences for development. As large observational studies and RCTs are lacking, little is known on the nature of the deficits, language recovery and the effect of speech and language treatment (SLT). To improve care for children with ACA, longitudinal data are necessary. We constructed a Dutch registry on ACA and will present results of the first six months.
Objective: more insight in ACA, patterns of recovery and the effect of SLT.
Patients: children aged 2-18 years with ACA due to brain damage.
Methods: a prospective, longitudinal, multicenter, observational study with a five-year follow-up and online data collection with Gemstracker®. Via a Delphi-procedure core outcome sets of language tests in four age categories were determined.
Results: 18 children were included (2-17 years). The main causes for ACA were stroke (39%) and traumatic brain injury (39%). Severe language deficits were found in 35% of the children. A third had severe word-finding difficulties. After six months, speaking had improved in 38% of the children, but in none of them language fully recovered. Language disorders remained unchanged in 50% of the children.
Discussion and conclusion: the registry provides clinically relevant and valuable insights in ACA. Despite having received SLT, language only improved in a small number of children. Larger studies with a longer follow-up, as this national database, are needed to investigate these findings in the long term.
Message: Join this Dutch registry to better understand and treat ACA!

P19

An innovative intervention to cope with and self-manage long-term consequences of cerebral palsy at adult age

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Introduction&objective: Study the effects of a group intervention on coping skills and self-management of frequent health complaints pain and fatigue in adults with cerebral palsy (CP).

Patients&methods: Twenty-nine adults ≥25y with CP, IQ>70; experiencing pain or fatigue, with care needs on coping/managing chronic complaints participated in 10 weekly group meetings and a follow-up session led by a psychologist to learn coping strategies and self-managing skills through education, action plans and psychotherapy. Assessments: prior to intervention (t0), after finishing (t1) and at 3 (t2) and 9 months (t3) follow-up. Coping and self-managing skills were measured with the Utrecht Proactive Coping Competence scale (UPCC), Social Problem-Solving Inventory-Revised (SPSI-R:S), Pain Coping and Cognition List (PCCL);Pain and fatigue (average and maximum) on Numeric Rating Scale (NRS), Pain Disability Index (PDI) and Fatigue Severity Scale (FSS). Data were analysed using Generalized Estimated Equations with overall time effects ($p<0.05$), and estimated mean difference (MD).

Results: Participants were 45.7±12.4y old; 17 females; GMFCS-level: I (n=5), II (n=13), III (n=7), IV and V (n=2). Pain coping improved (PCCL $p<0.00$; MD at t3= -0.29); coping and self-managing skills did not change ($p=0.28$; $p=0.27$). Pain did not change on PDI ($p=0.84$), average and maximum pain ($p=0.39$; $p=0.70$). Fatigue reduced on FSS ($p=0.02$) and maximum fatigue ($p=0.04$; MD at t3=-0.73), but not on average fatigue ($p=0.55$).

Conclusions: After following a group intervention on coping and self-managing health issues, adults with CP indicated improved pain coping skills and decreased severity and intensity of fatigue. Therefore, consider this intervention in adults with CP.

P20

Determining the smallest detectable change in wheelchair ergometer outcomes during propulsion wheelchair tests

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Introduction
The wheelchair ergometer (Lode Esseda) can be used to monitor propulsion variables of wheelchair users, for example to evaluate wheelchair adaptations. In order to interpret the outcomes of the measurements and to support clinical decision making, it is important to distinguish real changes in propulsion technique and physiological outcomes from measurement errors.

Objective
To determine the smallest detectable change (SDC) of the measured physiological and propulsion technique outcomes.

Subjects
19 able-bodied participants (9 male; age: 23±2,4 years, weight: 73±12,7 kg, length: 175±9,3 cm).

Methods
Participants provided four trials on the wheelchair ergometer. Two hand rim types (conventional aluminum and Gekko (CarboLife)) were tested in random order twice. Each trial consisted of a 30 seconds sprint and a four-minute submaximal duration test at 7 km/h with resistance based on body weight. The ICC, SEM, SDC were calculated for 2 physiological and 11 propulsion technique outcomes.

Results
Test-retest reliability is good to excellent and measurement error showed acceptable SDC-values (ICC=.78-.97; SDC=12.9-21.7%), except for asymmetry and gross mechanical efficiency.

Discussion and conclusions
The ICC, SEM and SDC can be further improved by using experienced wheelchair users, since unexperienced able-bodied participants are less consistent in their technique. Also, the SEM and SDC will further improve by performing repeated trials and taking the average over these trials.

Clinical message
With these results, we are able to interpret the wheelchair ergometer data and define real changes from measurement errors due to wheelchair adaptations or interventions.

P21

Limitations in activities and participation experienced by individuals with chronic inflammatory demyelinating polyneuropathy and multifocal motor neuropathy

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Introduction: Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) and Multifocal Motor Neuropathy (MMN) are rare immune-mediated peripheral neuropathies often causing muscle weakness which may lead to limitations in daily life.
Objective: To evaluate the self-reported limitations in activities and participation of individuals with CIDP or MMN and associated factors.
Patients: 405 adults diagnosed with CIDP (n=257) and MMN (n=148) who visited the department of Neurology at the UMC Utrecht from January 2017 till March 2021 were invited.
Methods: Cross-sectional survey study had been performed in April 2021. The survey included the Rasch-built Overall Disability Scale (CIDP and MMN versions) and the Utrecht Scale for Evaluation of Rehabilitation – Participation as well as questions addressing personal and disease related factors. Multivariate linear regression analysis was used to determine the association with disease related and personal factors.
Results: 196 patients participated (response 49%, 116 CIDP, 80 MMN). Large variation in limitations in activities and participation was found in individuals with CIDP, while individuals with MMN experiences less limitations. Disease severity, pain, fatigue and resilience were independently associated with activity and participation levels in CIDP. Multivariate linear regression for MMN could not been performed since assumptions were not met.
Discussion and conclusions: A large proportion individuals with CIDP and a smaller number with MMN experience limitations in daily life. Pain, fatigue and resilience significantly contribute to perceived limitations in individuals with CIDP which are potentially amenable to multidisciplinary rehabilitation treatment.
Clinical message: An interdisciplinary rehabilitation approach for individuals with CIDP and MMN should be considered.

P22

Walking with a resistance force applied to the trunk can stimulate propulsion after stroke

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Introduction
A decreased propulsive capacity post stroke is associated with a diminished walking ability. Therefore, improving propulsion should be an important focus in rehabilitation post stroke. When walking with a resistance force (RF) applied to the trunk, more propulsion is required to enable forward progression. This may stimulate propulsion after stroke. Before a RF can be used in training settings, the precise effects on propulsion mechanics and related muscles activation need to be assessed and compared between stroke patients and healthy individuals.

Objective
To determine the effects of a RF during walking on propulsive impulse and muscle activity related to propulsion in stroke patients and controls.

Patients
Seven hemiplegic chronic stroke patients and nine able-bodied age-matched controls.

Methods
Participants walked on a treadmill at 0.56m/s with and without a RF of 10% of their body weight applied to their trunk. The propulsive impulse and muscle activity of Biceps Femoris, Rectus Femoris, Medial Gastrocnemius and Soleus were recorded during walking.

Results
When a RF was applied, propulsive impulse and muscle activation amplitude of Biceps Femoris and Rectus Femoris during single stance increased. Effects of walking with a RF were similar between stroke patients and controls.

Discussion and conclusion
The results show walking with a RF increases propulsion. The upper leg muscles are specifically targeted in this intervention.

Clinical message
Walking with a RF increases propulsion and thigh muscle activity related to propulsion. The provision of a RF during treadmill walking may stimulate propulsive capacity after stroke.

P23

Physical recovery up to 12 months after hospitalization for COVID-19; results from the multicenter prospective CO-FLOW study

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Introduction: Long-term physical consequences and recovery patterns in COVID-19 patients who survived hospitalization are unknown.

Objective: To evaluate the trajectory of physical recovery of COVID-19 survivors up to 12 months post-hospital discharge.

Patients: COVID-19 survivors (age ≥18 years) discharged from hospitals in the Netherlands.

Methods: At 3, 6, and 12 months post-discharge, patients performed the 6-minute walking test and 1-minute sit-to-stand test for aerobic capacity. We used linear mixed model analyses, data are presented as estimated mean±standard error.

Results: We assessed 445 patients: mean age 59.7±11.7 years, 295 (66.3%) males, mean body mass index 29.3±5.4 kg/m2, 161 (42.4%) required intensive care, and mean hospital stay 18.8±19.2 days. Hundred patients (27.1%) received inpatient rehabilitation, mean stay 30.2±18.5 days. Overall, the 6-minute walking distance significantly improved from 3 months (474.8±6.4m) to 6 months (494.7±6.9m) and to 12 months (509.1±7.5m) post-discharge ($p<0.001$). A total of 19.1%, 20.4%, and 14.3% of patients walked a distance below the lower limit of normal at 3, 6, and 12 months, respectively. Over all measurements, the distance walked after inpatient rehabilitation was significantly shorter than without inpatient rehabilitation (difference 41.8±14.3m, $p<0.01$), which did not change over time ($p=0.7$). Outcomes on the 1-minute sit-to-stand test post-rehabilitation significantly increased from 3 months (21.5±1.3) to 12 (27.3±1.5) months, but not in patients without inpatient rehabilitation (26.3±0.7 and 27.3±1.1, respectively).

Conclusion: On average, physical recovery was observed in COVID-19 patients up to 12 months after hospitalization.

Clinical message: COVID-19 patients post-rehabilitation have reduced aerobic capacity, which partly recovers within one year follow-up.

P24

The needs regarding telemedicine of informal caregivers of stroke patients during rehabilitation: A qualitative study.

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Introduction: After stroke, patients regularly need informal care. Telemedicine offers opportunities by improving quality, accessibility and efficiency and can make informal caregivers of stroke patients more in charge of the rehabilitation process. The specific needs regarding individualised telemedicine for them were not clear by start of this study.
Objective: To clarify the needs during rehabilitation of informal caregivers of stroke patients regarding telemedicine.
Patients: Couples of adult, first-ever stroke patients and their (anticipated) informal caregivers were included during or after the physical rehabilitation phase.
Methods: In this qualitative study participants were recruited by healthcare professionals in physical rehabilitation medicine. Informal caregivers completed a questionnaire about demographic data. Subsequently, semi-structured interviews about the required support for informal caregivers in a few areas were recorded and transcripted. Deductive and inductive codes were used by descriptive analysis.
Results: Four middle-aged couples were included. All informal caregivers were partner of a stroke patient. They have several needs, but all want to use telemedicine for information about stroke and for emotional support by healthcare professionals or other informal caregivers. The post-rehabilitation phase including daytime activities was a frequently mentioned topic.
Discussion and conclusions: Informal caregivers of stroke patients have several needs during rehabilitation regarding telemedicine, also in the post-rehabilitation phase. Unfortunately, only a small number of patients and informal caregivers were included. Data saturation was not achieved. Future study with focus group discussion is recommended.
Clinical message: Informal caregivers of stroke patients do have several needs regarding telemedicine during rehabilitation and during the post-rehabilitation phase.

P25

Changes in fear of movement in patients attending cardiac rehabilitation: responsiveness of the TSK-NL Heart

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Introduction: Fear of movement (kinesiophobia) is related to low physical activity in cardiac patients and therefore important to target during cardiac rehabilitation (CR).

Objectives: 1] Determine the responsiveness of the Tampa Scale for Kinesiophobia in cardiac patients (TSK-NL Heart); 2] assess changes in kinesiophobia during CR; 3] determine predictors of high kinesiophobia post-CR.

Patients: 109 patients (61 years; 76% men) that participated in a 6 till 12-week CR program.

Methods: Kinesiophobia was measured pre- and post-CR with the TSK-NL Heart. Responsiveness was estimated with effect sizes (ES), standardized response means (SRM) and by correlating change scores on the TSK-NL Heart with those on the Cardiac Anxiety Questionnaire (CAQ) and the anxiety-scale of the Hospital Anxiety and Depression Scale (HADS-A). Logistic regression analysis was used to determine predictors of high kinesiophobia.

Results: The ES and SRM of the TSK-NL Heart were moderate for patients with improved CAQ and HADS-A scores (ES=0.52; SRM=0.57 and ES=0.54; SRM=0.60, respectively). There was a moderate correlation between the TSK-NL Heart and the CAQ (Rs=0.30, p=0.023) and a small correlation with the HADS-A (Rs=0.21, p=0.107). Prevalence of high kinesiophobia improved from 40.4% pre-CR to 25.7% post-CR (p=0.05). Strongest predictors of high kinesiophobia post-CR were high pre-CR scores on the TSK-NL Heart (OR=9.83, 95%CI:3.52-27.46) and the HADS-A (OR=1.26, 95%CI:1.11-1.42).

Discussion and conclusion: The TSK-NL Heart has moderate responsiveness. During CR, there were reductions in kinesiophobia. Nevertheless, 26% still had high kinesiophobia post-CR.

Clinical message: Kinesiophobia interventions should target patients that enter CR with high kinesiophobia and generic anxiety.

P26

Determining the difference between wheelchair adaptations, i.e. hand rim types, by using propulsion wheelchair tests on a wheelchair ergometer

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Introduction
Wheelchair adaptations are mainly based on expert opinion obtained from observation. To advice clinicians involved in adapting a wheelchair, this study aims to evaluate wheelchair adaptations, i.e. hand rim type, by measuring propulsion technique with a wheelchair ergometer (Lode Esseda).

Objective
To determine if differences in wheelchair adaptations, i.e. hand rim types, on physiological and propulsion technique outcomes can be detected by performing tests on a wheelchair ergometer.

Subjects
19 able-bodied participants (9 male; age: 23±2,4 years, weight: 73±12,7 kg, length: 175±9,3 cm).

Methods
Two hand rim types (conventional aluminum and Gekko (CarboLife)) were tested on the wheelchair ergometer twice. Each trial consisted of a 30-seconds sprint and a four-minute submaximal test at 7 km/h with resistance based on body weight. Wilcoxon Signed-Rank test was used to determine the differences in physiological and propulsion technique outcomes between the two hand rim types using the mean ($p<.05$).

Results
Six out of seven propulsion technique outcomes during 30-seconds sprint differ significantly in favor of the more ergonomic Gekko hand rim ($p\leq.02$). No significant differences were found between the hand rim types during the four-minute submaximal test ($p=.32$).

Discussion and conclusions
Differences between wheelchair adaptations can be captured by using a 30-seconds sprint on a wheelchair ergometer. Submaximal duration tests seem to be less suitable to assess differences between wheelchair adaptations, but results may be influenced due to unexperienced wheelchair participants.

Clinical message
A wheelchair ergometer can provide objective data to support clinicians in clinical decision making about wheelchair adaptations.

P27

Patients' and caregivers' preferences regarding a rehabilitation program aimed at fatigue after aneurysmal subarachnoid haemorrhage

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Introduction
Although fatigue in patients after aneurysmal subarachnoid haemorrhage (A-SAH) is a common problem, there are no rehabilitation programs available to reduce fatigue in this population. To increase the willingness to participate and therapy adherence, it is essential to take patients' preferences into account when developing such a program and relate these to caregivers' preferences.

Objective
To map patients' and caregivers' preferences with regard to a rehabilitation program aimed at fatigue after A-SAH.

Patients
Patients with A-SAH who suffer from fatigue and caregivers who work with patients with A-SAH in specialized rehabilitation care.

Methods
Semi-structured interviews comprising questions about preferences in location, frequency and treatment content were conducted in patients. Interviews were analysed using the Framework method. Caregivers were interviewed (non-structured) about current care.

Results
Interviews in ten patients (5 men, 50%) and ten caregivers were analysed. Average time post A-SAH onset was 10.9 months (SD=1.1) and mean age of the patients was 48.9 (SD=15.0) years. The majority of patients preferred physical activity over sessions with the psychologist and/or occupational therapist. Practical feasibility regarding frequency (not too high) and location (close to home) was important. Caregivers emphasized the importance of psychoeducation, support with day/week planning and focus on pre-existent movement behaviour.

Discussion and conclusions
Patients preferred focus on physical activity, whereas caregivers emphasized the importance of psychoeducation and support with planning.

Clinical message
For optimal therapy adherence a rehabilitation program aimed at fatigue after A-SAH should contain physical activity training and focus on pre-existent movement behaviour, psychoeducation and feasibility.

P28

Inertial measurement unit instrumented tests to evaluate gait during stroke rehabilitation: test-retest reliability

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Introduction
Gait is often impaired after stroke, restricting personal independence and affecting quality of life. Gait quality is not systematically measured during clinical rehabilitation, while research indicates that it provides additional information compared to existing clinical assessments. Inertial measurement units (IMUs) have the potential to assess gait quality in clinical practice. Therefore, IMUs might be suitable to evaluate gait during rehabilitation.

Objective
We examined the test-retest reliability of IMU derived gait features during a two-minutes walking assessment in sub-acute stroke patients during clinical rehabilitation.

Patients
Subjects were recruited in two rehabilitation-centers and eligible if diagnosed with stroke, capable of understanding and performing simple tasks and able to walk at least seven meters in two minutes.

Methods
24 Sub-acute stroke patients performed a two-minutes walking assessment, on a 14-meter parkours, twice within 24 hours. Subjects were equipped with three IMUs, at the left foot, right foot and low back. 184 gait features were computed, consisting of spatiotemporal (75), frequency (26), complexity (63) and symmetry (20) features. The test-retest reliability was calculated using the interclass correlation coefficient (ICC 2.1).

Results
73 spatiotemporal, 7 frequency, 49 complexity, and 14 symmetry features were measured with good-excellent reliability (ICC 0.75-1).

Discussion and conclusions
Gait quality can reliably be assessed from a two-minutes walking assessment in sub-acute stroke survivors during clinical rehabilitation.

Clinical message
Assessing gait using IMUs is feasible and reliable and may provide health professionals with additional insight into the walking ability of sub-acute stroke patients.

P29

Effective bowel management in Spinal Cord Injury during inpatient rehabilitation: Data from the Dutch Spinal Cord Injury Database

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Introduction Neurogenic bowel dysfunction (NBD) is one of the most important impairments in spinal cord injury (SCI) with a huge negative impact on quality of life.

Objective To describe bowel management in patients with SCI at admittance and discharge from first inpatient rehabilitation, and to determine predictive factors for achieving effective bowel management (EBM) at discharge.

Patients People with recently acquired SCI were included when admitted for their first inpatient rehabilitation to a specialized rehabilitation center in the Netherlands.

Methods Data from the Dutch Spinal Cord Injury Database (NDD) collected between 2015 and 2019 was used. A stool frequency >2 times a week to ≤ 2 times a day and fecal incontinence <1 a month, was defined as an EBM.

Results Of 1210 people, at admittance 818 patients (67.6%) had no EBM. Of them, 308 patients (37.7%) remained no EBM at discharge (in total 33.1% of all patients). A multivariate logistic regression analysis shows that patients with AIS-A (p=0.01) and non-traumatic etiology (p=0.02) are associated with higher odds ratio for no EBM at discharge.

Discussion and conclusions During first inpatient rehabilitation after SCI, regulating NBD is a major challenge. AIS-A and non-traumatic SCI are associated with higher odds ratio for no EBM at discharge.

Clinical message Bowel management after SCI should be monitored closely during first inpatient rehabilitation, especially in people with AIS A and non-traumatic SCI.

P30

The effects of an interdisciplinary rehabilitation program in patients following covid-19 infection: an observational study in an outpatient setting

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Introduction
Patients following COVID-19 infection can suffer from various degrees of impairments in respiratory, physical and psychological function. Moreover, a large sample of patients experience multiple symptoms months after the onset of the infection. Persistent symptoms have a major impact on health-related quality of life, performing activities of daily living, and participation in society. Therefore, an interdisciplinary approach to COVID-19 rehabilitation interventions seems necessary.

Objective
The objective was to explore the effects of an interdisciplinary, outpatient rehabilitation program in patients with complex symptoms and impairments in activities and participation following COVID-19 infection.

Patients
55 patients who completed the rehabilitation program provided informed consent. Data from 45 patients were included and analyzed.

Methods
A single-arm pragmatic observational study was initiated to explore the effects of interdisciplinary rehabilitation on health-related quality of life, anxiety, depression, and physical functioning including exercise capacity, muscle strength, and fatigue.

Results
Significant improvements were found for health-related quality of life regarding physical functioning, role limitations due to physical health, body pain, vitality, social functioning, and mental health. The other subscales showed no significant changes. Anxiety, depression, and physical functioning improved significantly.

Conclusions and clinical message
This study showed promising results regarding the effect of an interdisciplinary outpatient rehabilitation program in patients following COVID-19 infection. Nevertheless, these results need to be confirmed by a multicenter randomized controlled trial.

P31

Cognitive functioning, fatigue, and psychological outcomes up to 12 months after hospitalization for COVID-19

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Introduction: Patients with coronavirus disease (COVID-19) may experience long COVID, referring to persistent fatigue, but also to other lingering cognitive and psychological symptoms.

Objective: To evaluate the trajectories of these cognitive and psychological outcomes, and to assess the role of fatigue in long COVID.

Patients: COVID-19 survivors discharged from hospitals in the mid-west of the Netherlands.

Methods: We evaluated patients at 3, 6, and 12 months post-hospitalization with Montreal Cognitive Assessment (MoCA), Hospital Anxiety and Depression Scale (HADS), Impact of Event Scale-Revised (IES-R), and Fatigue Assessment Scale (FAS). We used linear mixed models for analyses.

Results: We have current data of 386 patients; 121 (32.4%) women, mean age 59.8±12.0 years, mean hospital stay 17.6±19.3 days, and 39.6% treated in intensive care unit. Mild cognitive impairment (MoCA<26) was present in 44.8%, 36.8%, and 31.6% of the patients at 3, 6, and 12 months, respectively. Anxiety (HADS-A≥8) was reported by 34.9%, 28.9%, and 22.0% of the patients; depression (HADS-D≥8) by 25.4, 24.7%, and 17.6%; post-traumatic stress (PTSS) (IES-R>33) by 12.7%, 10.8%, and 5.5%; and fatigue (FAS>22) by 57.1%, 55.1%, and 54.9% at 3, 6, and 12 months, respectively. All outcomes improved significantly over time ($p<0.005$). Fatigue was strongly associated with anxiety ($p<0.001$), depression ($p<0.001$), and PTSS ($p<0.001$), but not with cognitive functioning ($p=0.727$).

Conclusion: Up to one year post-hospitalization, many COVID-19 patients reported significant fatigue, cognitive and psychological problems. Recovery was observed over time, although fatigue persisted in the majority.

Clinical message: Fatigue seems to play a pivotal role in long COVID.

P32

Augmented rehab: using mixed reality in spinal cord injury rehabilitation – a pilot study

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Introduction

An active lifestyle is important for persons living with spinal cord injury, but challenging to achieve. Effective counselling about the consequences of the injury to their bodies is essential for long-term health. Conventional education methods, however, have barriers. In co-creation with patients, rehabilitation professionals and a software developer, we developed two Mixed Reality (MR) physical exercise games and an interactive MR patient education intervention explaining the consequences of a spinal cord injury. We hypothesized that MR games can promote physical activity, and that MR patient education can strengthen knowledge transfers.

Patients and methods

Twenty-five inpatients were enabled to use the MR apps for 2 weeks. During a 3 week pre-post design regular physical exercise was compared with MR physical exercise (on top of planned therapy). Motivation, usability of the apps, and subjective experience were evaluated using questionnaires and interviews.

Results and discussion

Seventeen patients completed the study, two discontinued due to usability problems. Feedback about the experience and usability was widely distributed, varying from “physically challenging” and “entertaining” to “difficult controls” and “too easy”. The clear visual explanation of the MR patient education was positively received. The MR games were not used much as physical exercise, possibly due to technical, practical barriers and time-consuming questionnaires.

Conclusions and clinical implications

MR games can be used for some patients as a method of leisure or exercise, and MR can improve patient education. Technical difficulties were perceived as barriers. The implementation in our spinal cord injury rehabilitation program will further be evaluated.

P33

The effect of AFO-tuning on gait in children with cerebral palsy

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Introduction: Ankle foot orthoses (AFOs) are frequently prescribed in children with cerebral palsy (CP) to improve kinematics and to align the ground reaction force (GRF) during gait. Modifying the external design of the AFO-shoe-combination (AFO-SC) to optimize gait parameters is defined as 'tuning'.

Objective: To investigate the effect of adding wedges to a child's prescribed AFO-SC on knee angle, shank-to-vertical-angle (SVA) and GRF.

Patients: 29 children with CP (7.8±3.5yr; GMFCSI-II) with a knee hyperextension (n=12) or excessive knee flexion gait pattern (n=17).

Methods: 2D video gait analyses were performed according to a standardized clinical AFO-tuning protocol under 4 conditions: AFO-SC alone, and with incrementing wedge height (0.5;1.0;1.5cm). Sagittal knee angle, SVA and position of GRF relative to the knee joint center were determined manually using MoxieViewer software. Two-way repeated measures ANOVAs or Friedman tests were performed to assess the effect of wedge height.

Results: With increasing wedge height the knee angle at midstance increased (p=0.044), whereas it decreased at opposite initial contact (OIC) (p=0.005), with a trend towards increasing SVA at midstance (p=0.055). Incrementing wedge height shifted the position of the GRF more posterior to the knee (p=0.042).

Discussion and conclusions: AFO tuning using wedges influences the knee angle in midstance and OIC and the position of the GRF in midstance. This could positively affect gait in children with CP, especially at midstance in a knee hyperextension pattern.

Clinical message: AFO tuning by adding wedges can be used to optimize knee angle and GRF during gait in children with CP.

P34

Effectiveness of Innovative Interventions for Cognitive Rehabilitation in Children with ABI, in Conjunction with a Serious Game

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Review:

Cognitive impairment is highly prevalent in children following Acquired Brain Injury (ABI), evident across multiple cognitive domains including attention, executive function, and memory. This may negatively impact activities and participation, such a returning to school and play. Advanced technology, such as Virtual Reality (VR), is gaining increased attention, particularly in conjunction with a Serious Game.

The overarching aim of this review is, therefore, to comprehensively evaluate the effectiveness of innovative interventions for cognitive rehabilitation in children with ABI, in conjunction with a serious game.

Innovative intervention studies for cognitive rehabilitation in children with ABI were identified on PsycINFO, PubMed and Scopus, using relevant keywords appropriate to each resource. Searches were initially conducted on 23 December 2020 and updated 26 April 2021. Restrictions were applied on language (English), year (>1999 - 2021) and age (0-18y). No restrictions were applied to publication status.

The authors included 11 studies; six were RCTs and five were non-RCTs. The following study characteristics were extracted: study characteristics, intervention characteristics and patient characteristics.

Of these, 10 studies represented Computer-Based Cognitive Retraining (CBCR) and one study represented VR. CBCR demonstrated significant improvements in memory, processing speed and select measures of executive function. However, mixed results were reported for attention and academic performance. VR appeared effective for improving attentional and executive processes.

CBCR and VR are considered promising novel approaches for cognitive training in children with ABI. Studies evaluating CBCR and VR should be considered preliminary due to risk of bias and limited number, respectively.

P35

Changes in bladder management during first inpatient rehabilitation after spinal cord injury and determining factors: Data from the Dutch Spinal Cord Injury Database

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Introduction
Bladder management in spinal cord injury (SCI) patients during first inpatient rehabilitation aims to reduce complications, accomplish safe and efficient urine storage, and guard the patient's independence.

Objective
To describe the methods of bladder management at admission and discharge in patients with recently acquired SCI and to evaluate factors associated with each method at discharge from the rehabilitation centre.

Patients
SCI patients admitted for first inpatient rehabilitation to a specialized centre in the Netherlands between 2015 and 2019.

Methods
Multicentre prospective observational study, using data from the Dutch Spinal Cord Injury Database.

Results
1403 patients were included. The level of SCI was cervical in 44%, thoracic in 38% and lumbosacral in 18%. AIS scale was A (12%), B (9%), C (15%) and D (64%). The method of bladder management at discharge changed significantly compared to admission ($p<.001$): from assisted intermittent catheterization (17.1% to 4.1%) and indwelling catheter (33.4% to 16.3%) at admission to clean intermittent self-catheterization (7.8% to 22.2%) and normal voiding (40.2% to 56.1%) at discharge. Age, gender, SCI level, AIS classification and SCIM score were related to the method of bladder management at discharge (all $p<.001$).
At discharge, 13% of the patients had urinary incontinence of which 37% used incontinence pads, 34% condom catheters and 27% did not use containment materials.

Discussion and conclusion
The observed transition in bladder management in SCI patients during first inpatient rehabilitation is in line with current guidelines.

Clinical message
The method of bladder management at discharge changed significantly compared to admission.

P36

Martial arts training for boys with Duchenne Muscular Dystrophy

A feasibility study

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Introduction: Multiple studies show the positive effects of martial arts on physical and psychosocial wellbeing. We think that a physical and psychosocial training program, based on martial arts, can also have positive effects for boys with Duchenne Muscular Dystrophy (DMD).

Objective: The primary aim of this pilot study was to investigate the safety and feasibility of a 3-month martial arts based training (MAT) program for DMD patients. The secondary objective was to examine changes in physical and psychosocial activities after participating in the MAT-program.

Patients: Twelve DMD patients (10 ambulant, 2 non-ambulant) were included after ethical approval was received and they signed informed consent.

Methods: The MAT program was found feasible and safe when the individual adherence rate was > 75% and no injuries or adverse effects occurred. Changes in physical activities were measured using the MFM, PUL and NSAA. Changes in psychosocial abilities were measured using the SDQ, PARS III and SPCC/SPPA.

Results: 2 participants did not complete the MAT program. Attendance rate for the 10 remaining participants was 91%. 11 falls were reported during the training, but these falls did not result in injuries. After completing the MAT program, most participants showed an improvement of their psychosocial abilities and their physical abilities did not show deterioration.

Conclusion/ discussion: The MAT-program is feasible and safe for boys with DMD, and there is a trend towards psychosocial improvement after the MAT-program. Future studies should focus on evaluating the effectiveness of the MAT program in a larger population.

P37

An innovative care pathway for botulinum toxin treatment

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Subject & Relevance:
Administration of botulinum toxin is widely used as a spasticity treatment.
In practice, a botulinum toxin treatment usually does not proceed uniformly, whereby the evaluation of the treatment effect takes place with different measuring instruments, at different times, or sometimes even by other practitioners. The aim is to create an unambiguous, effective and cost-efficient indication and evaluation of a botulinum toxin treatment, which can be easily implemented in other centers/hospitals.

Current status:
A care pathway that has been developed from the perspective of the patient, doctor, therapists and managers. The basic principle is that the diagnosis and evaluation of spasticity should be performed if possible, on the same day and by the same professionals. Depending on the treatment goal, uniform and targeted diagnostics are used. These consist of established measuring instruments, supplemented if necessary, with a temporary nerve or muscle block.
After the diagnostic phase, treatment advice is given on the same day. If a botulinum toxin treatment follows, this is evaluated in an unambiguous manner.
This care pathway describes an efficient route of indication and evaluation of a botulinum toxin treatment. For the patient this is organized as least burdensome, for the therapist as efficient and for the institution as most cost-controlled.

Plan of action:
Sharing our care pathway with other centers and hospitals. In our own center we have started with the organization of the policlinics and will plan an evaluation moment after six months.

P38

The course of pain in stroke patients receiving rehabilitation

Drs. Winke van Meijeren-Pont[1,2], MD, PhD Henk Arwert[1,3], MD, PhD Daniella Oosterveer[1,2], prof. Wilco Achterberg[2], prof. Thea Vliet Vlieland[1,2]
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Introduction: About 30-42% of patients were found to report pain in the subacute phase after stroke, but little is known on its course in the chronic phase.
Objective: Describe the course of pain and arm pain up to 30 months after the start of stroke rehabilitation.
Patients: 482 patients participating in the Stroke Cohort Outcomes of REhabilitation (SCORE) study.
Methods: Patients reported the presence (yes/no) of pain in the arm and/or elsewhere in the past week, 3, 18 and 30 months after start of rehabilitation. Pain was defined as pain in the arm and/or elsewhere.
Results: Patients' mean age was 60.7 years (Standard Deviation 11.7) and 345 (60%) were male. Three hundred fifty seven (74%) patients reported pain, of which 260 (73%) patients reported arm pain and at one or more time points. At 3, 18 and 30 months, the proportions of patients reporting pain were 293 (61%), 197 (53%) and 170 (53%), of which 188 (64%), 136 (69%) and 109 (64%) reported arm pain. Of the 189 patients reporting no pain at 3 months 64 (34%) reported pain at either 18 and/or 30 months. Of the 333 patients with pain at 3 and/or 18 months 77 (35%) had no pain at 30 months.
Discussion and conclusions: The majority of stroke patients report pain in the chronic phase after rehabilitation, which subsides in a minority and can arise in the chronic phase.
Clinical message: More attention for diagnosis and treatment of pain in the chronic phase after stroke is needed.

P39

Faecal microbiota in patients with neurogenic bowel dysfunction and spinal cord injury or multiple sclerosis - a systematic review

Drs. Willemijn Faber[1], Dr Janneke Stolwijk - Swuste, Dr Janneke Nachtegaal, Drs Florian van Ginkel, dr Erwin Zoetendal, dr Renate Winkels, prof dr Ben Witteman
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Objective:
A systematic review on microbiota in patients with Spinal Cord Injury and Multiple Sclerosis, and the possible role of neurogenic bowel function, diet and antibiotic use.

Search strategy:
A systematic search was conducted in Pubmed and Embase and methodological quality was assessed.

Selection of artcles:
We excluded articles on children, animals and with no control group. Articles should determine microbiota by 165 rRNA gene sequencing.

Evaluation and results:
We retrieved 14 articles, with a total of 479 patients.
Results of the studies suggested that alpha diversity in chronic SCI patients is lower whereas the alpha diversity of MS patients is similar compared to HC. Taxonomic changes in SCI and MS studies are diverse. Most studies did not account for possible confouding by diet, antibiotic use and bowel function. And furthermore, they only looked at one sample.

Conclusion:
Based on these 14 papers, we cannot draw strong conclusions. Putatively, alpha diversity in chronic SCI patients may be lower while in MS patients alpha diversity may be similar compared to HC.
Clinical consequences are difficult to draw.The lower alpha diversity might lead to bowel problems and NBD. In these patients, supplementing with probiotics or diet adjustments might have a positive effect.
Future studies should collect multiple faecal samples over time. Moreover, accurate collection and reporting of information about dietary intake, antibiotic use, NBD and changes in those factors should be required, together with better reporting on patients' characteristics and clinical metadata to draw rational conclusions and come to possible clinical consequences.

P40

Pain in Spinal Cord Injury During Initial Inpatient Rehabilitation: Data from the Dutch Spinal Cord Injury Database

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Introduction: Pain is a secondary condition which is frequently reported in spinal cord injury (SCI) and has a significant impact on quality of life.
Objective: To identify the prevalence of spinal cord injury (SCI) related pain during inpatient rehabilitation and investigate a possible relation between pain and patient/lesion characteristics.
Patients: SCI patients admitted to inpatient rehabilitation between 2013 and 2019 in the Netherlands.
Methods: Data were collected at admittance and discharge, including demographics and lesion characteristics. Odds ratios were calculated for prevalence of pain related to age, gender, etiology, completeness and level of injury. Odds ratios were adjusted for gender, age, ASIA impairment scale (AIS), etiology and level of injury.
Results: A total of 2700 SCI-patients were included in the analysis. Pain prevalence at admission was 40.2% for nociceptive pain and 30.6% for neuropathic pain. Pain prevalence at discharge was 25.4% for nociceptive pain and 31.5% for neuropathic pain. Having nociceptive pain was significantly related to AIS score, female gender and traumatic injury. Having neuropathic pain was significantly related to female gender, younger age, traumatic injury and tetraplegia.
Discussion and conclusion: SCI-related pain is highly prevalent during inpatient rehabilitation. Female patients and patients suffering from traumatic SCI have an increased risk of having nociceptive pain. Female patients, younger patients, patients suffering from traumatic SCI and tetraplegic patients have an increased risk of having neuropathic pain.
Clinical message: Caregivers should be aware of these differences in screening patients on pain during inpatient rehabilitation.

P41

Information needs and preferences in ALS patients in the Netherlands

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Introduction
Providing adequate information to patients with Amyotrophic Lateral Sclerosis (ALS), Progressive Spinal Muscular Atrophy (PSMA) and Primary Lateral Sclerosis (PLS) and their informal caregivers is pivotal for making informed decisions in their treatment.

Objective
To evaluate the information needs of patients with ALS, PSMA and PLS and their satisfaction with the received information with respect to the content, timing, format of information.

Patients
Patients with ALS, PSMA and PLS registered in the Biobank Neuromuscular Diseases of the UMC Utrecht and the Prospective ALS study Netherlands.

Methods
A digital cross-sectional survey has been sent by e-mail or post to a random sample of patients (N=270). The survey contained questions on content of different websites and other disease-specific information sources, timing and preferred format of information communication.

Results
In total 120 patients (44%) completed the survey. Two-third of the patients (N=79, 66%) uses the internet as source of information. Main source used is https://als-centrum.nl. Information given right after the diagnosis is experienced as confronting but suitable in time. Respondents were generally satisfied with the different sources. Preferences for format of information differed.

Discussion and conclusions
The majority of respondents in general are satisfied with the information provision by the different providers within the ALS care in the Netherlands with respect to content and timing. Patients need customized and adequately timed health information.

Clinical message
Websites are an important source of information, healthcare professionals should allocate resources to provide accurate information that is easy to find.

P42

Real-time assessment of fatigue reveals that fatigue after subarachnoid haemorrhage is not static but varies within and between days

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Introduction: Fatigue is one of the most commonly reported symptoms after subarachnoid haemorrhage (SAH). Fatigue is often assessed retrospectively with a questionnaire, wherein daily variability in fatigue is not reflected. Insight in variability in fatigue within and between days may contribute to optimizing interventions to treat fatigue after SAH.
Objective: To describe daily variability in fatigue after SAH using the ecological momentary assessment (EMA) method.
Patients: Patients with SAH who suffer from fatigue.
Methods: Cross-sectional study. Patients rated their real-time fatigue (scale 1-7) 10-12 times per day for 7 consecutive days using an electronic diary. In addition, fatigue (scale 1-7) was assessed with the Fatigue Severity Scale (FSS). Multilevel mixed-model analyses, including random slopes, were conducted.
Results: Forty-two patients with SAH (43% male) participated in the study. Mean age was 53.9 years (SD=13.0) and mean time post-onset was 9.3 months (SD=3.2). Mean real-time fatigue over all days was 3.22 (SD=1.47) and mean FSS score was 5.02 (SD=1.18). Total variance in fatigue was explained for 52.3% by between-person variance and for 47.7% by within-person variance. Multilevel analyses revealed that fatigue varied significantly ($p<0.001$) within the day. Moreover, this daily variability differed between individuals, and within individuals between days.
Discussion and conclusions: Fatigue after SAH is not static: real-time fatigue varies over the day. In addition, individuals show different fatigue patterns between days.
Clinical message: Daily variability in fatigue as assessed using the EMA method should be taken into account for optimizing personalized interventions to treat fatigue after SAH.

P43

Cardiac rehabilitation for patients with obesity: results of the OPTICARE XL RCT on health-related quality of life, fatigue and participation in society

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Introduction Patients with cardiovascular diseases are referred to cardiac rehabilitation (CR) for secondary prevention. More than a third of the patients suffers from obesity, and this number is growing. These patients do often experience problems with respect to psychosocial well-being and standard CR is known to be suboptimal.

Objective To describe the effectiveness of a new tailor-made CR program, OPTICARE XL, on HRQOL (primary), fatigue and participation in society.

Patients Cardiac patients with obesity.

Methods Patients were randomized to standard CR (n=99) or OPTICARE XL (n=102). Standard CR consists of a 10-week aerobic exercise program, supplemented with cardiovascular lifestyle education. OPTICARE XL is a one-year tailor-made group intervention including aerobic and strength exercise, behavioural coaching and an after-care program. Short-term results were evaluated three months after the start of CR, long-term results six months post CR.

Results On the short-term and long-term, both groups showed significant within-group improvements in HRQOL, fatigue and participation in society. The OPTICARE XL group showed a significantly larger improvement in perceived restrictions with participation in society than the standard CR group on the short-term (USER-P score 83.4 to 90.5 versus 83.4 to 86.6, respectively, p=0.030).

Discussion and conclusions Short-term effects of OPTICARE XL did not sustain on the long-term. Redesign of the after-care program is needed to expand improvements on the assessed outcomes to the long-term.

Clinical message Tailor-made care for cardiac patients with obesity is important. The OPTICARE XL program needs to be redesigned to achieve optimal results with regard to psychosocial well-being.

P44

Recovery of functional mobility and lower limb function during the first 3 months post-stroke in patients with visuospatial neglect: Preliminary results of a longitudinal cohort study

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Introduction
Various studies suggest an association of visuospatial neglect (VSN) with impaired functional mobility (i.e., sitting, standing, transfers), with longer rehabilitation trajectories for VSN patients compared to non-VSN patients. Research mainly focused on upper limb recovery and little is known about functional mobility with respect to the lower limbs.

Objective
To investigate the longitudinal recovery of functional mobility in patients with and without VSN.

Patients
Patients with a first-ever stroke (18-90 years) and leg paresis were included.

Methods
Patients were included either at < 14 days, 3 weeks or 5 weeks and followed-up at 3 weeks, 5 weeks, 8 weeks and 12 weeks post-stroke. VSN was assessed with the Broken Hearts Test, leg paresis with the Motricity Index (MI), and functional mobility with the Rivermead Mobility Index (RMI). A linear mixed model was fitted with RMI score as depended variable, random intercept (patient ID) and random slope (patient ID*baseline MI score), and with fixed effects 'Time', 'Initial VSN' and 'MI score'.

Results
Eighteen VSN patients and 25 non-VSN patients were included. Presence of initial neglect and paresis of the lower limbs, and time post-stroke onset were significant predictors for RMI score.

Discussion and conclusions
Over time, VSN was a significant negative predictor for RMI score, even if the model corrected for leg paresis. VSN patients show lower functional mobility throughout time with a lower recovery potential compared to non-VSN patients.

Clinical message
VSN should be diagnosed and treated early after stroke considering its potential suppressive effect on functional mobility.

P45

A clinical perspective on functional problems in adults with cerebral palsy, with respect to, intellectual and walking disability; preparing an ICF Core Set for adults with CP

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Introduction
Seventy-five percent of the population with CP is at adult age. In order to optimize clinical care and research an ICF Core Set for adults with CP will be developed.

Objective
To identify functional problems in adults with CP in northern Europe, stratified by intellectual disability and walking disability.

Patients
Adults with CP visiting rehabilitation centres in the Netherlands and Sweden.

Methods
Semi-structured interviews were conducted with participants using an adapted version of the ICF checklist 2.1a to assess functional problems and impact of environmental factors, with 106 categories in 21 domains. Frequency of problems were analysed, addressing specific subgroups of patients (intellectual disability, non-walkers), corrected for age.

Results
Sixty participants were included, 30 of each country, mean age 36.36 y (± SD 13.49y), 18.3% with an intellectual disability, 40% functional walkers. At least 75% of the adults indicated problems in 25 categories (of 10 domains): 7 body functions, 1 body structure, 6 activities and participation,11 supportive environmental factors. In addition, subgroups with intellectual disability or non-walkers reported extra problems (22 or 14 categories added), regarding mental functions, mobility-related functions, self-care, education and employment.

Discussion and conclusions
Adults with CP in Europe visiting rehabilitation centres experience a high number and broad variety of functional problems, and a supportive impact of environmental factors.

Clinical message
- Adults with CP in northern Europe experience many and various functional problems.
- They experience environmental factors mostly as facilitating
- In adults with intellectual disability or non-walkers additional ICF categories may need attention.

P46

4PM&R: Stay informed about scientific rehabilitation research

Drs. Wouter Vints[1], Drs. Maurice Sopacua[1], Drs. Zoë van Mechelen[1], Drs. Eva-Maria Lefferts[1], Drs. Audrey Vollebregt[1], Dr. Henk-Jan Prins[1], Drs. Judith Sparidans[1], Dr. Peter Heuts[2], Drs. Rob Riksen[2], Drs. Wip Bakx[1]
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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic:
Rehabilitation research journals

Relevance:
Nowadays the number of articles published is high and it is hard for rehabilitation physicians, paramedics or researchers to keep up with the increase of medical knowledge and innovations. However, both your colleagues and your patients expect you to be up to date.

Therefore, we propose 4PM&R, which is a spin-off of 4Abstracts and stands for “For Physical Medicine & Rehabilitation”.

4PM&R is a free email service offered by Dutch residents in training and rehabilitation physicians. Readers receive a monthly overview of recently published scientific articles from six leading journals in the field of Physical Medicine and Rehabilitation. The four most striking, instructive or interesting articles per journal are selected. Especially articles with a direct impact on clinical practice are chosen by the editors. Hence, readers can save the time of finding these articles themselves, while enjoying a monthly total of 16 abstracts offering a broad overview of scientific progress in rehabilitation medicine.

Current status:
Since November 2020 everyone can register to this service on the webpage https://www.4abstracts.com/spin-offs/4pm-r or via the general website www.4abstracts.com, after which you choose “Subscribe” to sign up. The ten editors are volunteers, which allows the service to be completely for free and ad-free.

Plan of action:
Our aim is to reach more rehabilitation doctors by increasing national and international knowledge of our initiative. Our initiative appeared in the VRA newsletter and in ‘Nederlands Tijdschrift voor Revalidatiegeneeskunde (NTR)’. It was recently submitted to the Belgian newsletter for physical medicine and rehabilitation.

P47

The longitudinal association between movement behavior patterns and the course of participation in people with stroke up to one year after discharge to the home setting.

Drs. Joris de Graaf[1,2], Dr. Roderick Wondergem[2,3,4], drs. Eline Kooijmans[1,2], dr. Martijn Pisters[2,3,4], dr. Vera Schepers[1,2], Prof. Cindy Veenhof[2,3,5], Prof. dr. Anne Visser-Meily[1,2], Prof. Marcel Post[1,6]

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Introduction: Movement behavior (the composition of time spend sedentary and time spend in light, moderate or vigorous physical activity) is a modifiable factor in stroke rehabilitation, but its association with the course of participation after stroke is currently unknown.
Objective: (1) To investigate the differences in the course of participation up to one year after stroke between distinct movement behavior patterns identified directly after discharge to the home setting, and (2) to investigate the longitudinal association between the development of movement behavior patterns over time and participation after stroke.
Patients: 200 individuals with a first-ever stroke were assessed directly after discharge to the home setting, at six months and at one year.
Methods: The Participation domain of the Stroke Impact Scale 3.0 was used to measure participation. Movement behavior was objectified using accelerometry for 14 days. Participants were categorized into three distinct movement behavior patterns: sedentary exercisers, sedentary movers and sedentary prolongers. Generalized estimating equations (GEE) were performed.
Results: Participation improved up to six months after discharge and stabilized afterwards across all movement behavior patterns. Sedentary prolongers identified directly after discharge were associated with a worse course of participation up to one year after stroke. The development of sedentary prolongers over time was also associated with worse participation compared to sedentary exercisers.
Conclusions and clinical message: The course of participation after stroke differs across distinct movement behavior patterns after discharge to the home setting. Highly sedentary and inactive people with stroke are at risk for restrictions in participation over time.

P48

De Huidige Knelpunten in de Zorg voor Neuromusculaire Aandoeningen in Relatie tot een Netwerk: Een Kwantitatieve Studie

Drs. Ronne Pater[1,2], Dr. Nicole Voet[1,3], Dr. Anita Beelen[4], Drs. Annette van de Geest[4], Drs. Esther Kruitwagen - van Reenen[4], Drs. Saskia Houwen - van Opstal[3]
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Om de zorg voor kinderen en volwassenen met neuromusculaire aandoeningen (NMA) te verbeteren is in 2020 een project gestart om een landelijk multidisciplinair zorgnetwerk te ontwikkelen, beginnend bij de diagnoses FSHD en SMA als pilot-groep.
Het doel van dit onderzoek is: inventariseren van 1) de huidige knelpunten, en 2) de wensen ten aanzien van een netwerk in de zorg voor NMA en 3) het opstellen van mogelijke strategieën ter verbetering.
Het onderzoek is uitgevoerd onder relevante stakeholders (mensen met FSHD, eerste, tweede en derdelijns zorgprofessionals) en reeds bestaande netwerken.
Kwalitatieve data is verzameld via vragenlijsten (n=138), diepte-interviews (n=44) en focusgroepen (n=6).
Hieruit blijkt dat er behoefte is aan meer (behandelaren met) kennis van NMA, samenwerking tussen zorgprofessionals uit verschillende zorglijnen en aan uniforme, holistische en bereikbare zorg.
Mogelijke strategieën zijn het mogelijk maken van patiënt-gerichte-overleggen tussen verschillende lijnen en organisaties, afspraken m.b.t. uniformiteit in zorg en klinimetrie, en gerichte scholing voor zorgprofessionals.
Aanbevelingen bij het vormen van een netwerk zijn: het streven naar structureel implementeren van de mogelijke strategieën in de Nederlandse zorg gecombineerd met een open structuur van het zorgnetwerk, waarbij er vrijheid blijft in het kiezen van zorgverleners.
Vervolgstappen voor het project zijn het uitvragen van de wensen van mensen met SMA en FSHD, het aangaan van samenwerkingen met reeds bestaande netwerken en initiatieven en het starten van projecten om de zorg te verbeteren.
Klinische Relevantie: Het onderzoek geeft duidelijk richting aan het ontwikkelen van een netwerk dat bijdraagt aan verbetering van zorg voor alle mensen met NMA.

P49

Differences in quality of life between Europeans and non-Europeans in a Dutch hospital based stroke population.

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Introduction
In the literature, ethnicity is an independent determinant of outcome after stroke. In Europe, data on this topic is lacking.

Objective
To determine the differences in quality of life (QOL) between European and non-European patients, 2-5 years after stroke in a Dutch hospital population.

Patients
Patients, 18 years and older, hospitalized after an ischemic or hemorrhagic stroke (2008-2010).

Methods
In this retrospective cohort, data was collected from hospital files and by questionnaires regarding stroke characteristics, sociodemographic characteristics and QOL 2-5 years poststroke. QOL was measured by the EQ-5D (EuroQol-5D) and SF-36 (Short Form; psychical and mental component scores, PCS and MCS respectively). These outcomes were compared between Europeans (born in Europe) and non-Europeans (born elsewhere) by linear regression analysis, corrected for age, sex, stroke severity (Barthel Index on admission) and educational level.

Results
The study included 207 patients (mean age 63.1 years, SD14.4; 125M/82F; Barthel 13.3, SD6.5; education high/medium/low 55/77/77), 169 European, 38 non-European (14 Indonesia, 9 Suriname, 5 Antilles, 10 others). PCS was higher in the Europeans compared to the non-Europeans (42.9, SD13.3 vs 35.4, SD13.1; p=0.003). Likewise, Europeans had better EQ5D outcomes than non-Europeans (.762, SD.221 vs .599, SD.336; p<.001). The MCS was not significantly different between the two groups.

Discussion and conclusions
In stroke survivors, Europeans have better long-term outcomes regarding QOL than non-Europeans, corrected for age, sex, stroke severity and educational level.

Clinical message
Poststroke care programs probably has to take ethnicity into account as a relevant determinant for the outcome after stroke.

P50

Measuring of trans-tibial residual limb volume.

Drs. Z Grootkarzijn[1], Drs. R.E. Winter, Dr. E.C.T. Baars
[1]*Vogellanden*

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Introduction: Over the past years, different methods for measuring residual limb volume have been developed and studied. Contemporary scanners in measuring are an iPad combined with a structure sensor or the M4D scan. Benefit of both systems is they are easily available and simply to use. However, no literature is available showing reliability of these non-contact scanners.

Objective: The purpose of this study is to assess reliability, concurrent validity and usability of two non-contact scanners (M4D scan and iPad combined with a structure sensor).

Patients: This study uses six different scale models, divided in three bulky and three coniform trans-tibial residual limb models.

Methods: This study is a repeated measures experimental design. Six different scale models were measured on two different occasions, each consisting of two sessions. Per session all observers measured the six scale models with two different systems. The volume of the model was measured from mid-patellar tendon point to distal end of the model. User satisfaction was evaluated with the Post-Study System Usability Questionnaire.

Results: Data was collected in April and May of 2021. The data is currently being analysed. The analysis is expected to be completed in July.

Discussion and conclusions: Not yet available.

Clinical message: Not yet available.

P51

The use of the Withings Pulse HR smartwatch in a cardiac rehabilitation program

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Poster sessie, November 11, 2021, 4:05 PM - 4:45 PM

Topic
Basalt performed a pilot study to explore the feasibility of using the Withings Pulse HR smartwatch (WP) in patients with heart failure (HF) attending a cardiac rehabilitation program. The WP was used as an objective measurement to guide training intensity during exercise training at home.

Relevance
Guidelines advise HF patients to participate in cardiac rehabilitation to improve exercise capacity and quality of life. To guide training intensity during rehabilitation, exercise prescription can be based on the subjective Borg Scale of Perceived Exertion or heart rate frequency. This study evaluated the WP as an objective method to guide the home-based exercise program.

Current status
Patients received the WP when attending the exercise program. The accompanying app was installed on their telephone. Personalised heart rate-based training zones were provided. The WP measured, recorded and analysed heart rate frequency during home-based exercise. To evaluate the user-friendliness of the WP, questionnaires and structured interviews were held. Data on heart rate frequency was evaluated to determine adherence to predetermined exercising training goals.
Results demonstrated that the WP positively affected the duration of exercise training in the appropriate heart rate training zone. Furthermore, patients determined the WP as user-friendly. However, more patient information on how to use the WP is needed.

Plan of action
Based on the results of this study, the WP will be integrated in the cardiac rehabilitation program of patients with HF. Additionally, the smartwatch will be used in collaboration with a local hospital as part of an integrated care pathway.

P52

Fatigue among young patients with acquired brain injury in the rehabilitation setting: interpreting and categorizing fatigue severity levels.

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Introduction: Fatigue in young patients with acquired brain injury (ABI) is common. However, a clear way to categorize and interpret fatigue severity to better target and evaluate fatigue is lacking.
Objective: To determine fatigue, its relation with Health-related quality of life (HRQoL), and to categorize fatigue-severity in young patients with ABI referred for rehabilitation.
Patients: Children(5-12yr), adolescents(13-17yr) and young adults(18-24yr) with ABI and their parents in the outpatient rehabilitation setting.
Methods: This cross-sectional study used the PedsQL™Multidimensional-Fatigue-Scale to determine fatigue (18-items, patient&parent-reported, lower scores=more fatigue). Patient characteristics and mean (standard deviation; SD) fatigue and HRQoL scores were calculated per group. Fatigue-severity was categorized based on previously published scores from healthy agematched peers; 1"less fatigued"= >+1SD, 2"comparably fatigued"= -1SD to+1SD, 3"moderately more fatigued"= -1SD to-2SD, 4"severely more fatigued"= >-2SD.
Results: Two-hundred-sixty patients and/or parents participated (29% children, 54% adolescents, 17% young adults), 195(74%) had traumatic-brain-injury. Both patients and parents in all age-groups reported high fatigue-levels, means ranged from 40.2-57.5 (patient-reported) and 46.5-59.9 (parent-reported) per age-group. Older patients reported highest fatigue-levels (mean=40.2, SD=17.5). Scores in the "severely more fatigued"-category were common among 9% of the children, 50% of the adolescents and 58% of the young adults. HRQoL-scores decreased when patients/parents fatigue-scores related to a more severe fatigue-category.
Discussion/conclusions: Categorizing fatigue severity looks promising for clinical practice and showed that many patients were "severely more fatigued"-than healthy agematched peers.
Clinical message: Measuring and categorizing fatigue severity could help to better target and evaluate fatigue in young patients with ABI during (outpatient) rehabilitation treatment.

P53

Serious Gaming: What are the Possibilities for Innovative Cognitive Diagnostics in Children with Congenital Heart Disease?

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Clinical/experimental research:

Children with congenital heart disease (CHD) are at risk for cognitive impairment, which can significantly hamper academic performance and social integration, leading to decreased functioning in daily life. To better explain and predict cognitive impairment, there is an urgent need for more sophisticated tests that measure subtle cognitive impairment and the complexity and dynamics of everyday life. Virtual Reality (VR) Serious Games may be just what we need.

The objectives were: (1) to investigate the feasibility and user experience of a VR Serious Game; (2) to evaluate and compare cognition utilising conventional neuropsychological testing (NPA) and a VR Serious Game.

Children with CHD and typically developing children, aged 10 years.

To estimate cognition, a conventional NPA was administered and the children played six cognitive games. A user experience questionnaire was administered to evaluate feasibility and user experience.

The cognitive games were well received by both groups, which appeared to increase motivation. Associations between the NPA and the Serious Game require further analysis.

Innovative technology appears promising for NPA, especially with children who are enthusiastic about novel hardware and gaming. Whilst the conventional NPA remains a useful tool to estimate the patient's current optimal level of cognitive performance, VR Serious Gaming offers novel opportunities to assess cognitive abilities in more dynamic environments, increasing motivation.

By dynamically measuring cognitive performance, cognitive complaints and level of functioning can be better explained and predicted. In turn, enhanced care can be efficiently delivered through psychoeducation and treatment.

P54

Beter zorg dragen voor je eigen medicatie begint bij (revalidatie)verpleegkundigen

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Introductie: Medicatie zelfmanagement training heeft als doel te zorgen dat de patiënt op een veilige en passende manier thuis voor zijn medicatie kan zorgen. Verpleegkundigen zijn verantwoordelijk voor deze training. We weten onvoldoende welke competenties zij hierbij inzetten en welke knelpunten zij ervaren.
Doel: Met behulp van het Generiek Model Zelfmanagement (GMZ) in kaart brengen welke competenties verpleegkundigen gebruiken bij medicatie zelfmanagement training en wat zij nodig hebben om aan te sluiten bij behoeften van patiënten.
Patiënten & Methoden: Kwalitatief onderzoek met 3 standaard casus bij verpleegkundigen werkzaam op de klinische revalidatieafdeling van Tolbrug. De casus bevatten competenties uit het GMZ voor patiënten (vermogen tot zelfontplooiing, vertrouwen in eigen kunnen, ziekte-specifieke kennis en vaardigheden), en voor zorgverleners (kennisoverdracht, coachvaardigheden, en wegwijzen voorzieningen).
Resultaten: Alle verpleegkundigen hebben oog voor zelfontplooiing van de patiënt, d.w.z. verminderd ziekte-inzicht en/of andere cognitieve problemen. Ook het ontbreken van vertrouwen in eigen kunnen wordt door alle verpleegkundigen gesignaleerd. Er is weinig oog voor medicatie-specifieke kennis en vaardigheden van de patiënt. Kennisoverdracht gebeurt door uitleg over aanwezige hulpmiddelen voor medicatie in eigen beheer, maar nauwelijks over medicatie-specifieke onderwerpen. Alle verpleegkundigen vinden coaching belangrijk onderdeel van training. Hoewel zij aangeven hierin voldoende ervaring en expertise te hebben, geven zij bij patiënten met verminderde zelfontplooiing aan behoefte te hebben aan ondersteuning. Wat zij specifiek nodig hebben, verschilt per verpleegkundige.
Conclusie: Bij medicatie zelfmanagement training kan winst behaald worden in medicatie-specifieke kennisoverdracht en in coachvaardigheden bij patiënten met verminderde zelfontplooiing. Om verpleegkundigen optimale ondersteuning te bieden, is maatwerk nodig.

P55

Rehabilitation after COVID-19: A short report

Drs. Roel Straathof[1], MD, Phd Henk Arwert
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COVID-19 infection can result in severe illnesses, making prolonged Intensive Care treatment necessary. Afterwards, persistent symptoms may arise, e.g. respiratory problems, muscle weakness and cognitive impairment.

Objective

To describe the characteristics and outcomes of patients who underwent inpatient multidisciplinary rehabilitation following COVID-19.

Patients

COVID-19 patients admitted for inpatient rehabilitation between March 1 and September 1, 2020.

Methods

Patient characteristics were recorded on admission. Clinical tests and questionnaires during rehabilitation entailed: Montreal Cognitive Assessment (MOCA), Hospital Anxiety and Depression Scale (HADS), PTSD Checklist for DSM-5 (PCL5) and physical tests.

Results

89 COVID-19 patients were included (30F/59M; age 58.9 (SD11.2)); BMI 27.4 (SD6.6); median hospital stay was 37 days (range 6-139)and 24 days at the Intensive Care Unit (ICU) (range 3-125). On admission 32 patients were still in need of oxygen; 22 (25%) patients had dysphagia of which 11 (50%) needed enteral feeding. Cognitive deficits were observed in 31% (MOCA<26); symptoms of anxiety or depression were observed in 19% and 12% respectively (HADS>7). Twelve patients (13%) were treated for Post-Traumatic Stress.

Median duration of inpatient rehabilitation was 28 days. All patients were discharged to their homes. Use of orthosis was necessary in 9 patients.

Discussion and conclusion

A selection of COVID-19 patients surviving hospitalization can benefit from inpatient rehabilitation. A multidisciplinary approach is imperative given the medical, cognitive and mental problems patients may experience. All patients were discharged to their home environment.

Clinical message

Inpatient multidisciplinary specialistic rehabilitation is indicated for a selected group of COVID-19 patients after Intensive Care treatment.

P56

Discussing personalized prognosis of survival in amyotrophic lateral sclerosis: A qualitative study of patients, caregivers, and physicians

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Introduction Amyotrophic lateral sclerosis (ALS) is a motor neuron disease with variable survival ranging from less than 1 year to over 20 years after symptom onset. The ENCALS survival prediction model offers patients with ALS the opportunity to receive a personalized prognosis of survival at diagnosis.
Objective To explore experiences of patients with ALS, caregivers, and physicians with discussing personalized prognosis.
Patients Recently diagnosed patients with ALS with whom the personalized prognosis was discussed (12), caregivers (9), and physicians (5).
Methods A qualitative study using semi-structured interviews (patients and caregivers), and a focus group (physicians). All transcripts were thematically analysed.
Results Patients' prognosis ranged from short to very long. Three overarching themes with eight subthemes emerged: Tailoring of communication: Emotional impact was mediated by the physician's communication style and tailoring of information provision. Personality and cognitions. Coping style, illness cognitions, and information needs affected how patients and their caregivers coped with the prognosis. Regaining control over the future. The emotional impact on patients ranged from happy and reassuring to regret, they found it helpful looking towards the future, and emphasized the importance of quality over quantity of time left. Themes were confirmed by the focus group.
Discussion and conclusions Personalized prognosis can be discussed with patients with ALS who want to know their life expectancy. Patients and caregivers underscored that how this was communicated was as, or even more important than what was communicated.
Clinical message Tailor discussion of personalized prognosis to emotional and information needs of patients and caregivers.

P57

Outcomes that matter to children and youth with a disorder of head, brain or senses

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Introduction
At the Pediatric Brain Center (PBC) of Erasmus MC – Sophia Children's hospital , a long-term follow up of children with neurodisability is set up. Patients and caregivers' input is needed to ensure the importance of outcomes to them.

Objective
To identify meaningful outcomes from the perspective of caregivers and children with neurodisability.

Patients
Children with neurodisabilty visiting the PBC or Rijndam Rehabilitation Centre

Methods
Fifty-eight outcomes of health and functioning were identified from the perspectives of caregivers and children, published studies and outcome sets. In an online survey respondents rated the importance of these outcomes on a 9 point Likert scale. Items rated as 'very important' by >=70% of the respondents were selected as meaningful outcomes.

Results
Thirty four surveys were completed (31 unique patients, mean age 9.1 years (SD 6,3 years) and 13 various diagnoses). We selected 27 meaningful outcomes addressing communication, mobility, relationships and participation in community, as well as learning, emotional function, behavior, senses, pain and physical health.

Discussion and conclusions
A large number of outcomes was considered meaningful by the vast majority of children with neurodisability and their caregivers. As expected, these cover multiple aspects of health and functioning.

Clinical message
For children with neurodisability, it is important to address social-emotional aspects as behavior, communication and interpersonal relationships, in addition to physical functions.

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P58

Focus groups study on the facilitators and barriers in wearing therapeutic footwear in different subgroups of Diabetic patients with loss of protective sensation

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Introduction

People with diabetes and loss of protective sensation have low adherence to therapeutic footwear. This is alarming, since therapeutic footwear is important to prevent foot ulcers. To improve the adherence, it is important to increase knowledge and awareness among people with diabetes as well as to understand which aspects are important in the perception of the use of footwear. This can be done with a focus group study.

Objective

Provide insight in the factors perceived as facilitators or barriers for wearing therapeutic footwear for different subgroups of people with diabetes.

Methods

Three group (n=24) discussions were organized. They are different based on experience with therapeutic footwear and the severity of the disease.

Results

The top three ranked factors related to use of therapeutic footwear, differed in the groups. The group with foot ulcers in the past, was the only group with 'ulcer prevention' in the top three. Although the other two groups with no ulcers in the past, found 'ulcer prevention' important too, it was not in their top three.

Discussion

Patients without ulcers in the past, can explain the importance of wearing therapeutic footwear to prevent foot ulcers when they are asked about it. However, it seems that they do not recognize the importance since it is not ranked in their top three most important factors for use of therapeutic footwear.

Message

More awareness on the importance of therapeutic footwear in primary prevention of foot ulcers is needed in people with loss of protective sensation due to diabetes.

P59

Self-efficacy training in persons with SCI

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Introduction: This poster presents the first results of a self-efficacy training in persons with Spinal Cord Injury (SCI) in the Hoogstraat Rehabilitation. This training is based on the "Re-inventing Yourself after Spinal Cord Injury" treatment programme for improving self-efficacy after SCI (Coker et al., 2019).
Objective: The aim of the poster is to present the first results of a self-efficacy training to enhance self-efficacy in persons with SCI in order to deal with their changing life circumstances after SCI.
Methods: Pilot pre-post design. At the start and the end of the self-efficacy training, depression and anxiety were assessed with the HADS and self-efficacy was assessed with the University of Washington-Self-Efficacy Scale. Moreover, qualitative interviews with participants and the 3 trainers took place at the end of the training.
Results: On average, participants scored higher on self-efficacy at the end of the self-efficacy training than at the start. Participants of the training were enthusiastic about the programme. They told they learned skills to cope with the SCI, e.g. to ask for help and to speak openly about their situation. The trainers of the self-efficacy training noticed a process of mental growth in the participants of the training due to discussing theory, practicing together and learning from peers.
Discussion and conclusion: A self-efficacy training stimulates self-efficacy in persons with SCI and seems a valuable part of a rehabilitation programme after SCI.
Clinical message: Based on these results, the self-efficacy training will be continued in the SCI rehabilitation programme of The Hoogstraat rehabilitation.

P60

Revalideren is Leren, óók voor zorgprofessionals.

Wat zijn de ervaringen, wensen en behoeften van zorgprofessionals?

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Inleiding: Om de revalidant mede-eigenaarschap over zijn revalidatieproces te geven en de overstap naar de thuissituatie soepeler te laten verlopen, is op de klinische afdeling van revalidatiecentrum Tolbrug het concept Revalideren is Leren (R=L) geïmplementeerd. Binnen dit concept moet de zorgprofessionals zijn 'zorgbril' verwisselen voor een 'leerbril' en zo wel "leer" expert (coach), als inhoudelijk 'expert' zijn.
Patiënten & Methode: Via een kwalitatieve studie met semigestructureerde interviews zijn ervaringen, wensen en behoeften van verschillende zorgprofessionals die werken volgens het concept 'Revalideren is Leren' in kaart gebracht. In totaal zijn acht zorgprofessionals geïnterviewd in de periode van maart t/m april 2021.
Resultaten en discussie: Doordat er meer interdisciplinair wordt samengewerkt, zien professionals verbetering op de volgende vlakken: vakoverstijgend (interdisciplinair) werken, initiatief nemen, vrijheid, tijd en leren van elkaar. Wat zij nog moeilijk vinden is dat het proces van de revalidant leidend is bij de uitvoering, dat verwacht wordt dat ze meer 'doen met' in plaats van 'praten over'. Zij geven aan dat cognitief aangedane revalidanten zonder ziekte-inzicht lastiger meekomen in de open structuur van R=L. Het is voor professionals moeilijk regie te nemen in de uitvoering van revalideren is leren (ruimte nemen binnen de autonomie die zij krijgen). Het vertrouwen in zichzelf en elkaar ten aanzien van de beheersing van het concept R=L is nog niet optimaal.
Conclusie: De ervaringen van de zorgprofessionals van de klinische revalidatieafdeling binnen Tolbrug zijn overwegend positief over R=L. Veel verbeteringen hebben plaatsgevonden, maar voor vraagstukken rondom hun eigen regie zijn de zorgprofessionals nog zoekende.

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Revalideren is leren is voor iedereen

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Inleiding: Om de overstap van revalidatie naar huis te verkleinen en de revalidant medezeggenschap te geven over zijn revalidatieproces, is er op de klinische revalidatieafdeling de Tolbrug de werkwijze ‘Revalideren is Leren’ (R=L) toegepast. Binnen deze werkwijze dienen de zorgprofessionals vakoverschrijdend aan de slag te gaan en protocollen los te laten. Zij nemen een generaliserende rol aan als revalidatiecoach om aan te sluiten op vragen van de revalidant.

Patiënten & Methode: Middels een kwalitatief onderzoek met semigestructureerde interviews zijn de drie basisbehoeften van verschillende zorgprofessionals die werken volgens het concept ‘Revalideren is Leren’ in kaart gebracht. De aanwezige mate van deze basisbehoeften geeft een indicatie voor de aanwezigheid van autonome motivatie en/of mogelijke groei hierin. In totaal zijn acht zorgprofessionals geïnterviewd in de periode van maart t/m april 2021.

Resultaten en discussie: De zorgprofessionals zijn nog zoekende naar hoe zij de werkwijze eigen maken. Zij hebben nog onvoldoende vertrouwen in elkaar om als één geheel interdisciplinair team de uitdaging aan te gaan. Dit geeft onzekerheid. De onzekerheid heeft effect op zowel de autonomie als competentie. De zorgprofessionals zijn vanwege de grote verandering nog aan het wennen. Structuur wordt gemist en dit heeft effect op het maken van eigen keuzes. Ook laat dit hen twijfelen aan het bezitten van voldoende kennis en kunde.

Conclusie: De drie psychologische basisbehoeften worden op dit moment onvoldoende ondersteund, waardoor het creëren en de groei van autonome motivatie beperkt wordt. De zorgprofessionals zijn op weg om de basisbehoeften te versterken, maar zijn hier nog zoekende in.

P62

Cognitive assessment in a digital era: current state-of-art in neuropsychological outcome

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Background: Cognitive performance is often assessed with neuropsychological paper-and-pencil tasks in a laboratory setting. This method is designed to assess the maximum capacity of the brain with respect to cognitive functions, given most optimal circumstances. In order to make predictions of cognitive performance during daily life situations, innovative techniques are required to mimic complexity and dynamics of daily life situations and to generate more fine grained outcome measures. This study provides an overview of current state of art to estimate cognitive capacity in dynamic situations with innovative techniques and novel outcome measures.

Method: A systematic review was performed (2008–2021) using PubMed and Scopus. Cognitive measures regarding memory, attention and executive functions were extracted from the following techniques: computer tasks, real-life tasks, serious games, Virtual Reality (VR) and Augmented Reality (AR) simulations. The current study focused on three novel outcome measures: Accuracy (e.g. hits, misses, false alarms, correct rejections, total score); Duration (e.g. reaction time; completion time; time target is found); Efficiency (e.g. effective strategy, rule break); Eye movement (e.g. eye fixations, duration fixations, number of gazes).

Results: Of the 546 articles were found, 55 articles met the inclusion criteria. 15 focusing on computer tasks, 13 real-life tasks, 27 VR simulations, no AR simulations and no Serious Games. Accuracy measures were most often used (80-100% of the studies, irrespective of technique). Total duration to complete the task was used in 54-74% of studies, irrespective of technique. Efficiency was used in 46% of real-life tasks and 41% of VR simulations. Only in 15% of VR simulations (and no other method), eye gaze events were measured.

Conclusion: Technological advances in neuropsychological assessment allow for novel, more sensitive and ecologically valid outcome measures. However, in most studies accuracy and total duration were used as estimations of cognitive capacities. Moreover, AR and SG techniques are mostly used for training motor skills. Even though designing more interactive simulations and tasks increases ecological validity, and even observing your patients during simulations will increase our insights in mechanisms underlying cognitive complaints in daily life, the potential of digitized assessment and novel sensitive outcomes measures is currently not employed to its full extent.

P63

Trends in defining and distinguishing virtual reality in post-stroke rehabilitation

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Objective. Critique has been voiced on the broad use of the term “virtual reality” (VR), but this critique was not based on systematic evidence. In this study, we assessed how review papers on post-stroke rehabilitation defined VR and what types of mixed reality systems were described as “VR”.
Search strategy. We searched for reviews in Scopus, Web of Science and PubMed. Keywords for the search string were “stroke”, “virtual reality” and “rehabilitation” and synonyms for these terms.
Selection of articles. We identified 366 unique records through the database search and excluded 245 articles. Reasons for exclusion were: not a review; not about stroke, virtual reality or rehabilitation; no full text available; no full text in English or Dutch.
Results. 36% of reviews did not define VR. We identified 16 mixed reality types that greatly differed in level of immersion, the extent to which real and virtual information were mixed and the way patients interacted with the system. In contrast, the most common distinction of VR in the literature was into two categories (immersive versus non-immersive). In addition, the seven most frequently mentioned systems all used a 2D monitor with limited field of view rather than the latest immersive technology.
Conclusion. Our analysis revealed that reviews on post-stroke VR rehabilitation did not or only broadly defined “VR” and did not focus on a specific system. Since the efficacy and feasibility of rehabilitation may depend on the specific system, we propose a new data-driven taxonomy to distinguish different systems.