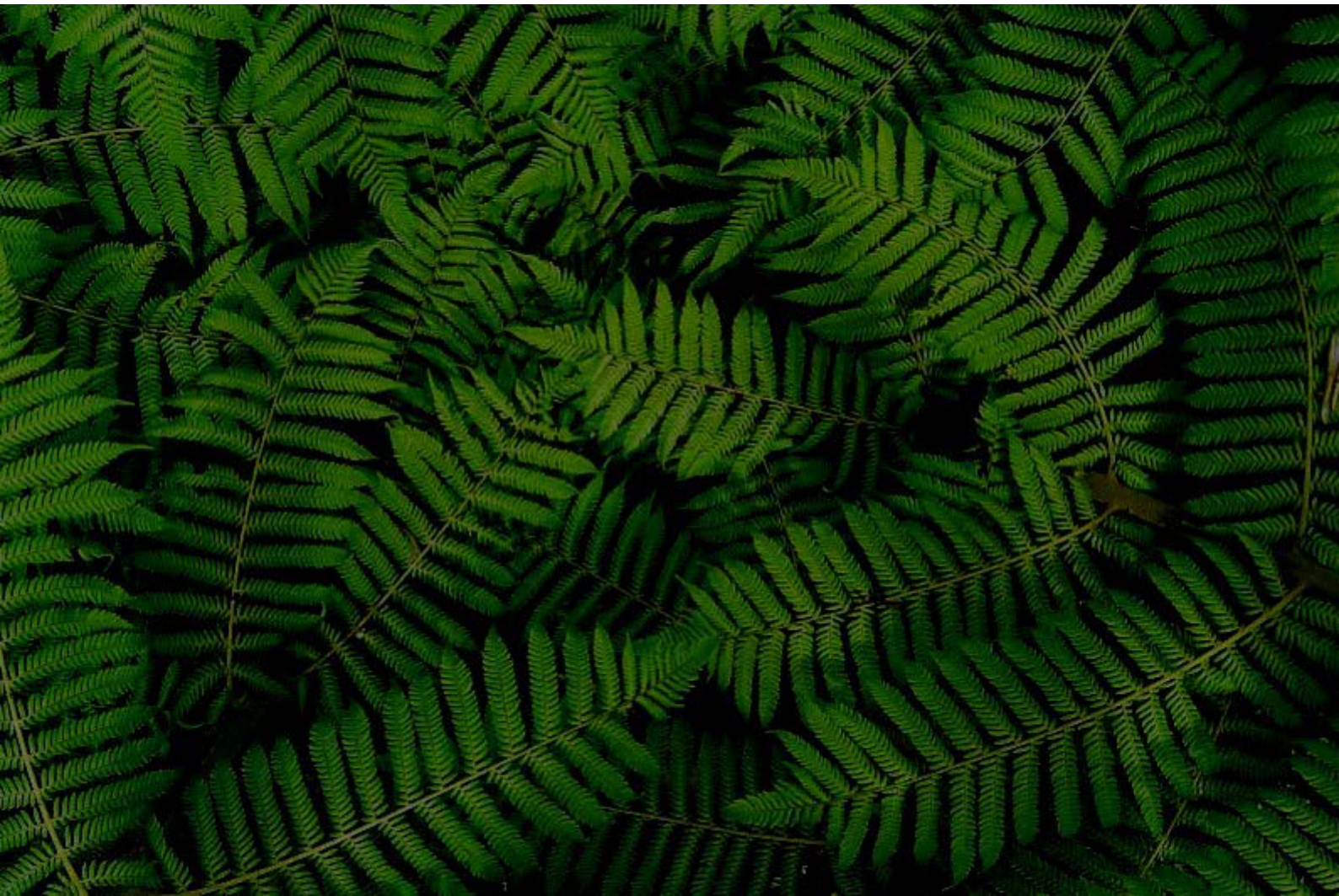
Hosted by Seating to go
Pumau ki te Oranga
Part of the Geneva Healthcare Group


F5 Corpus VS
More than just mobility.
Scan here to learn more!
w | permobil.com
p | 0800 115 255
e | sales.nz @permobil.com
permobil

TABLE OF CONTENTS



WELCOME

Kia ora – Welcome!

On behalf of the committee, we would like to warmly welcome you to the third Oceania Seating Symposium, coming to you from Aotearoa, New Zealand. We acknowledge these have been unprecedented times and we have been encouraged by the support and flexibility our colleagues and friends from across the sector have shown as we have navigated the move to a fully virtual programme.

The theme of the conference, Whanaungatanga: Connecting People and Communities, embraces the importance of relationships, past and present. The Oceania Seating Symposium (OSS) is a partnership between Seating To Go in New Zealand, and Swinburne University of Technology in Australia, and we would not be here without the encouragement and support of Maureen Story and the International Seating Symposium (ISS) Vancouver team. Many of you will know that the original ISS meeting took place in Vancouver in 1983 and we were saddened to hear that they were unable to proceed with their event this year. ISS Pittsburgh also had to pivot in the weeks leading up to their event in January, to a fully virtual programme. We have been grateful for the advice and support from Mark Schmeler and his team at ISS Pittsburgh as we also made the move to a virtual platform.

Thank you to all our sponsors including Platinum Plus Sponsor Permobil, Platinum Sponsor Allied Medical, and Gold Sponsors C1South, Invacare, Sunrise Medical, Cubro and Morton & Perry. We would be unable to run the conference without all our partners and we hope the move away from a virtual exhibition hall and into our main programme is a positive one for all.

I am incredibly lucky to have two amazing teams to support me as New Zealand Chair of OSS – the Seating To Go whānau who have taken up the slack as we get closer to the event and helped with the practicalities of hosting OSS, and the small but dynamic OSS Committee. Our team includes the Australian Chair, Rachael McDonald who is so generous with her time – I don't know how she does it; Liz Turnbull who did me the greatest favour by stepping into my old role as Service Manager at Seating To Go – a compassionate and thoughtful leader; Lu Budden and Dean Bradley from Convention Management NZ Ltd who live the motto "Keep calm and carry on"; Fi Graham and Bonnie Sawatzky who generously offered their expertise on the Programme Committee.

Finally welcome to all our invited speakers, delegates and presenters. You are an amazing group of people from all over the world. OSS 2022 will be a memorable event because of your contributions.

Ngā mihi

Deb Wilson - New Zealand Chair OSS

SYMPOSIUM THEME:

Whanaungatanga - connecting people and communities

We belong to one of the most beautiful countries in the world, RICH in culture. Through the years tikanga Maori has diluted and adapted to survive as the world changes around it...however some core principles have stood the test of time. Whanaungatanga is one of these principles representing Aotearoa's age old culture of connecting and caring.

It means different things to different people, but in essence it paints a picture of belonging to something bigger than oneself. A "bigger picture" full of people that live, love and band together through both their celebrations and tribulations, to form that beautiful thing we call our whanau.

In our mahi we are privileged to be welcomed into many whanau in their time of need, supporting where we can in what can be very dark times. Delving deeper into this beautiful kaupapa can only serve to strengthen our ability to awhi our whanau through these shadows, and strengthen our bonds as a community...so let's have that korero.

As we emerge from a challenging time globally, this korero is more important than ever. The Oceania Seating Symposium in Aotearoa (New Zealand), April 2022, is an opportunity for the wheeled mobility and seating community to reconnect and share our experiences, strengthening not only our ties to each other but our skillset to grow and be impactful in our position within our communities.

"Whiria te tangata"
- Weave the people together


ROHO Hybrid
Select Cushion
Scan below to
learn more
permobil
Ph: 0800 115 255 | e: sales.nz@permobil.com | www.permobil.com

GENERAL INFORMATION

Keeping to time

The virtual platform is set to start and finish on time as per the programme.

Access to platform dates

For all those that have registered for OSS Virtual, a link to access the platform will be emailed a few days before the Symposium. Access is granted to the individual for 3 months after the event to access the presentation recordings for the days you have registered.

Some presenters may provide handouts and/or a copy of their PowerPoint slides. These can be found on the platform alongside their presentation.

Chat Q&A / Live stream Q&A

Chat Q&A is where questions are typed to the presenters. If they are available, they will type a reply or save the question for the live stream Q&A. Chat Q&A is the only option for the 30 & 15min sessions & posters. Presenters and attendees can add to the chat Q&A at any time during the event.

Live stream Q&A is where the presenter is live on screen. They won't be able to see you but will answer any typed questions live. Live Q&A is only available for 60min or more sessions.

Passport prize – Be in to win!

Attend the OSS Sponsor's sessions, answer the questions correctly via Survey Monkey by 30 April 22, and be in to win a $500 Amazon card or a free registration to OSS 2023 in Melbourne, Australia. (a survey monkey link will be emailed to all those registered)

Attendance certificates

These will be available on the website after the symposium.

Refresher certificates

NZ Therapists only

Level 1 & Level 2 Wheeled Mobility & Postural Management Refresher certificates are available for therapists registered for the 3day event, who have engaged with at least 16 hrs of online content between 5 April – 30 June. This time frame has been extended due to pressure on our workforce during the Omicron outbreak. All session recordings will be available via the platform for 3 months.

Reviewed on 30 June 22.

You will need to add which level you are applying for to your registration before 3rd of April.

Breakfast session with the International Society of Wheelchair Professionals (ISWP)

This is separate event, hosted by ISWP. All delegates and presenters will be forwarded the Zoom link prior to the session.

Networking function – how it works

Join us online Wednesday 6th April for the networking function and the OSS Quiz.

EMPOWERING NEW ZEALANDERS TO LIVE THEIR LIVES WITH DIGNITY, **NO MATTER WHAT...**

OUR PROMISE TO YOU...
SPEED, EASE AND CONSISTENCY

What you get when working with Allied Medical

- 6 Technical Product Specialists and 3 Outbound Technicians across the country
- 6 DMERT certified In-house Technicians
- Three warehouses covering both the North and South Islands storing over 50,000 products and parts
- New Zealand based Customer Care Team to assist with quotes, trials and product queries
- Online quote tool for instant quotes for non-complex products
- Monthly certified training for Technicians and Subcontractors
- Access to clinical education, training, and helpful resources
- Fun, kindness, and a commitment to help others - from all our team!

www.alliedmedical.co.nz

ALLIED MEDICAL LIMITED

COMMITTEE

Full Committee Members

Debbie Wilson (Aotearoa/New Zealand Chair)

BappScOT, NZROT,
Training Lead / Clinical Specialist, Seating To Go, New Zealand

Deb Wilson is an Occupational Therapist with over 30 years clinical experience. She is the Training Lead of Seating To Go, part of the Geneva Healthcare Group and a leading wheelchair and seating assessment, training and repair service in New Zealand.

In 2009, she helped develop the NZ Ministry of Health wheeled mobility and postural management credential for occupational therapists and physiotherapists. She is the NZ Chair for OSS and has contributed to capacity building in the Pacific Islands with Motivation Australia. Deb is currently a member of the ISWP Wheelchair Educators Package Development Group.

Rachael McDonald (Australian Chair)

Associate Professor Rachael McDonald is a clinical, research and teaching Health Professional with an interest in enabling people with lifelong disabilities to participate in life situations. She has worked extensively in this field, within both children's services and adult settings, and has worked in the area of wheelchair and seating provision and evaluation for over 20 years across the UK and Australia.

She supervises research (honour's, MSc and PhD) students specialising in the care of people with complex disability, and has published widely. She previously held a joint appointment with the Department of Occupational Therapy and the Centre for Developmental Disability Health Victoria at Monash University. Her role at CDDHV included health professional education and leading research activities, however her interest in using technology as an enabler but also as a tool for collecting objective evidence was a feature of her occupational therapy research.

This interest has led to her recent appointment as the Chair of the Department of Health and Medical Science at Swinburne University of Technology, where this research is developing further and she is looking forward to more in depth applications of technology to improving the experience of people who use seating and wheelchairs.

Liz Turnbull

Bachelor of Occupational Therapy (with merit), NZ Registered OT
Service Manager, Seating to Go, New Zealand Training Lead / Clinical Specialist, Seating To Go, New Zealand

Liz Turnbull is the Service Manager for Seating to Go, a specialist service providing assessment, repairs, and modification throughout the Waikato, Lakes and Bay of Plenty regions, and training and mentoring services nationwide.

Liz graduated with a Bachelor of Occupational Therapy from Otago Polytechnic in 1997. Since qualifying she has worked in several practice areas including acute care and rehabilitation in hospital settings and community rehabilitation in both New Zealand and the UK.

Having enjoyed assistive technology thorough out her career, Liz began working in the field of complex wheelchairs and postural management in 2007 when she joined Auckland's regional specialist Ministry of Health assessment service, Mobility Solutions. Since 2007 she has worked in clinical, coaching and leadership roles within the wheelchair and seating. She has been involved extensively in service development, working groups and professional forums within the sector and is a member of the national Enable Panel for the credentialing of therapists in Wheeled Mobility and Postural Management – Level 2 and complex custom fabrication.

Liz joined the Seating to Go team as Service Manager in 2021. Having a special interest in professional development, evidence informed practice, education and coaching means Liz is delighted to be a part of the OSS planning team again.

Programme Committee Members

Associate Professor Bonita Sawatzky

Bonita Sawatzky is an Associate Professor in the Department of Orthopaedics at the University of British Columbia. Dr. Sawatzky has worked extensively with people with spinal cord injury, including traumatic and non-traumatic populations, as well as adults and children. The focus of her research has been to find ways to make mobility easier and more efficient for those with spinal cord injuries. This includes developing a better understanding of the biomechanics of mobility and identifying ways to educate individuals on how to walk or wheel more effectively. In addition, Dr. Sawatzky has begun to explore more specifically issues related with ageing such as technologies and training for older populations, as well as understand functional changes with ageing of individuals with rare spinal cord diseases. She worked with the Vancouver ISS committee for 18 years and now enjoying working with the OSS organizing committee!

Dr Fiona Graham

Fi (Fiona) is an occupational therapist, specialising in work with families and children. Her PhD with the University of Queensland has examined the effectiveness of coaching parents of children with disabilities to enhance children's success in everyday life. Fiona developed Occupational Performance Coaching (OPC) as part of her PhD and continues to research and provide training in OPC. Current research interests include working with families and caregivers, therapists' uptake of evidence-based practice, undergraduate clinical training and the efficacy of participation-focused interventions.

Fi teaches in the Diploma of Rehabilitation and the Certificate in Health Science (Clinical Rehabilitation) at University of Otago, Wellington.

Symposium Managers

We are pleased to join the team and bring you the OSS virtual.

Lu Budden & Dean Bradley
Convention Management NZ Ltd

Email: Lu@cmnzl.co.nz
Phone: +64 21 407 158

Independence Chairs

"A Vela chair gives the user more independence inside their home or at work"

- With electric Hilow function
- Walkable
- Central brake
- Many assessories
- Customisable to user needs
- Dropdown armrests for easier transfers

Morton&Perry
Healthcare Equipment Solutions

0800 238 523
mortonperry.co.nz

C1 SOUTH

FUNCTION - INDEPENDENCE - CHOICE

www.c1south.co.nz info@c1south.co.nz

SUPPORTING PARTNERS

PLATINUM PLUS PARTNER

Permobil founder Dr. Per Uddén believed that helping people achieve the greatest level of independence is a basic human right and, for over 50 years, Permobil has held fast to that belief. Here at Permobil, we take a personal approach to wheelchairs and seating systems. It means every product we create is inspired by the real lives of people with limited mobility.

It means each of our employees strives every day to solve the challenges of mobility, comfort and safety. Challenges our customers face every day.

And it means that, no matter what our customers are striving for, we're there to support them, using the latest technologies and our own ingenuity. Why? Because we believe everyone has the right to the same standards.

For more information about our range of products including manual/power wheelchairs, seating and positioning products, power assist, along with our clinical resources see here:

New Zealand

www.permobil.com/en-nz
www.facebook.com/PermobilNZ

Australia

www.permobil.com/en-au
www.facebook.com/PermobilAus

PLATINUM PARTNER

Owned and operated in New Zealand, Allied Medical offers a wide selection of assistive technology including New Zealand's largest collection of wheelchairs and powerchairs combined with a range of backs, seating, supports and accessories. Based in Auckland with team members in Hamilton, Hawke's Bay, Wellington, Christchurch and Dunedin, Allied Medical's vision is to empower New Zealanders with solutions to live their lives with dignity, no matter what.

www.alliedmedical.co.nz
www.instagram.com/alliedmedical
www.facebook.com/AlliedMedicalLtd

GOLD PARTNERS

Improving people's lives is part of our DNA. Since 1983, we've pioneered the era of the high-performance wheelchair, challenged conventions and led innovation. Today, Sunrise Medical is one of the most globally well-known and recognisable industry leaders in the design, manufacture and distribution of mobility products.

Our key products, marketed under the Quickie, Zippie, Breezy, Sterling, JAY and Breezy Everyday proprietary brands, are sold through a network of dealers or distributors in over 130 countries. Sunrise Medical headquarters is in Malsch, Germany with North American headquarters in Fresno, California, and employs 2,200 associates worldwide.

Our mission is simple, improve people's lives by creating innovative, high-quality products.

Our customers always come first, we are committed to exceeding expectations and building relationships, providing individualised mobility solutions based upon their needs.

For more information about our range of products and clinical resources visit our website: www.sunrisemedical.com.au

OR

Follow Our Social Media: www.facebook.com/SunriseMedical.AU
www.instagram.com/sunrisemedicalau

Morton & Perry is a private NZ company formed 25 years ago, with its primary goal 'To make a difference'. "We like to challenge the Status Quo and always strive to add value to clients, therapists & contract stakeholders".

Morton & Perry's Key Products:
Meyra & TA Powerchairs: Manufactured and designed in Germany & Denmark. From Standups (Sky & TAiQ) to all terrain (Optimus 2 & RS), and everything in between. All chairs are inclusive of many power functions. more info

Vicair seating: The lower maintenance air cushion. With improved microclimate and 100% machine washable. Now also with improved user reach performance. more info

Nxt back systems. Incl. the popular Xtend (height adjustable) backrest, offer the perfect fit & function. more info

Vela Independence Chairs: Vela offers enhanced seating options, including elevate. Providing indoor independence for those with limited mobility. more info

Our dedicated team are here to support you and your clients, we will provide you with the latest technology solutions. We do not compromise on quality and function.

www.mortonperry.co.nz

GOLD PARTNERS cont.

C1 South specialises in wheelchair seating and provides a range of quality, innovative products from around the world to promote function, independence and choice for people with a disability. We provide the latest solutions and technology 'south' of the 'C1' (the top of the spine) to help improve the quality of life and overall well being for the end user.

www.c1south.co.nz

Cubro have been enhancing the quality of life for the elderly and disabled since 1983 by providing the latest innovative equipment solutions across communities, aged care facilities and the wider healthcare industry throughout New Zealand.

Built on a long history of customer-focused ethics and family values, we are committed to fostering a culture of care, supporting people with their mobility and independence.

We are a trusted healthcare supplier, backed by an extensive range of reputable equipment, and a strong, compassionate team. We have more than 130 employees based throughout New Zealand with offices, service and distribution centres in Auckland, Tauranga, Wellington, Nelson and Christchurch. We also offer our own dedicated freight, install and a qualified service and maintenance team.

www.cubro.co.nz

Invacare manufactures and distributes a comprehensive range of personal assistance products to help our users enjoy a comfortable, safe and active lifestyle. Our mission is embodied in our company motto to "Make Life's Experiences Possible". Today, Invacare is a global leader in the worldwide market for medical products and services used in the home. Invacare designs, manufactures and distributes an extensive line of innovative home and long-term care medical products and services that promote recovery and active lifestyles. We are committed to understanding our customer's needs and exceeding their expectations to help rebuild and maintain active lifestyles.

www.invacare.co.nz

BRONZE PARTNERS

ottobock.

www.ottobock.com.au

Melrose
KIWI CONCEPT CHAIRS

www.melrosechairs.co.nz

MEDIX 21™
HELPING YOU MOVE AHEAD

www.medix21.co.nz

REHASENSE
more than mobility

www.rehasense.com

TOURISM
NEW ZEALAND

Provided a supporting grant to help take our event to people from across the globe. We look forward to welcoming you in person to beautiful Aotearoa, New Zealand, in the future.

24-hour positioning takes a team

We know it takes a team to achieve complete postural care for your clients and their whānau. And we're here to help you achieve it.

Let our trusted team of solutions advisors and RNZOTs guide you through the possibilities. Together, we can achieve anything.

CUBRO

Together, we care

Call us for free advice on 0800 101 211

sales@cubro.co.nz | cubro.co.nz

INVACARE

Yes, you can.

matrx SEATING SERIES

E2 Back SERIES

The Ripple Effect

Postural Support for independent mobility.

INVITED SPEAKERS

Amanda Lowry

Amanda broke her neck eight years ago in a surfing accident. The accident, that rendered her a tetraplegic, set her life on a new trajectory. Post – injury she slowly began to build a new life with her young family finding innovative ways to do the things she loved. Amanda got back in the water and spent two years learning to move her body and swim again. She started playing wheelchair rugby and found the freedom and joy of competitive sport, and connected with a fabulous community that helped her negotiate the realities of her new body. Both swimming and wheelchair rugby offered Amanda high-performance opportunities, she chose swimming. There is never been an athlete with her level of impairment ever swim for New Zealand. Amanda believes that involvement in sport is transformational and is currently working towards a PhD examining welfare and care in high-performance disability sport. Prior to her accident she had received a Masters SocSc for her work on Māori State engagement. She works with several not-for-profit organisations in the disability sector. Her research interests examine the structures and institutions that underpin the exclusion of minority groups.

Invited Speakers cont.

Associate Professor Tim Adlam

Dr Tim Adlam is an Associate Professor of Global Disability Innovation at UCL Global Disability Innovation Hub in London, and director of the multidisciplinary MSc in Disability, Design and Innovation. For over 20 years, Tim has worked to create technology to enable disabled people to do what they want to do, working across physical and cognitive disability, including early powered mobility and dynamic seating for children with dystonia. He advocates a thoroughly engaged approach that solves problems that matter to disabled people with beautiful, useful and usable technology. Children are born curious so it is important that we enable all children to do what they love to do: to explore and discover the unknown in the world and in themselves. To do this, they need to move. Tim is father of a child with autism and cerebral palsy who has taught him never to make assumptions about what is possible.

Professor Rachael McDonald

Professor Rachael McDonald is currently the Chair of Nursing and Allied Health at Swinburne University of Technology and the research program lead in Chronic Disease and Disability in the Iverson Health Innovation Research Institute. Rachael is a clinical, teaching and research health professional who is passionate about supporting people living with disabilities to participate in the life situations that they want and need to, and has/is supervising 17 research students, has over 100 publications including 50 in peer reviewed journals and has attracted over $4m of research funding to enable this to occur. Placing people at the heart of research about them is key.

Jean Minkel

PT, ATP

Ms. Minkel is a physical therapist and master clinician well recognized for her work in Assistive Technology. She is currently the Senior Vice President at ICS - Independence Care System, a not for profit, care management agency for persons living with a physical disability in New York City; where she also leads the, On A Roll seating clinic. Jean has been an invited keynote speaker at conferences in the US, Canada, Australia, New Zealand and Japan. She is a published author, including many peer reviewed journal articles and most recently, she co-edited, with Michelle Lange, the newly published textbook, Seating and Wheeled Mobility – a Clinical Resource Guide. The A.T. community has recognized Jean for her contributions by awarding to her, the RESNA Fellow award in 1995 and the Sam McFarland Mentor Award in 2012.

Invited Speakers cont.

Lisbeth Nilsson

PhD, Reg. Occupational Therapist
Associated to Lund University, Sweden

Lisbeth Nilsson is a PhD and specialist in occupational therapy and associated researcher of Occupational Therapy and Occupational Science at Lund University, Sweden. She developed the intervention Driving to Learn™ in powered wheelchair for people with profound cognitive disabilities. Her special interests are tool use learning and assessment and facilitation of the learning process. She and her collaborator Durkin, PhD and OT, UK, developed the Assessment of Learning Powered mobility use (ALP).

Her current focus is implementation of the ALP tool in powered mobility intervention and other fields of assistive technology. She is actually collaborating and carrying out research nationally and internationally with OTs, PTs and SLPs; and she has presented and published her findings worldwide since 1998.

Invited Speakers cont.

Dr Carlee Holmes

Carlee is the senior physiotherapist in the Young Adult Complex Disability Service (YACDS) at St. Vincent's Hospital Melbourne and also works in private neurological practice. The YACDS is a transition service from paediatric to adult healthcare for young adults with complex medico physical disabilities including cerebral palsy.

Carlee has a particular interest in the measurement of postural asymmetry in non-ambulant adults with cerebral palsy and is currently completing a PhD investigating "Assessment and Management of the common postural characteristics in young adults with Cerebral palsy". She has also gained additional certification in Postural Care and Measurement of Body Symmetry.

Carlee is a research associate for CP Achieve and involved in the consumer working group. She is also a member of the American Academy for Cerebral Palsy and Developmental Medicine Lifespan committee.

Carlee has worked in spasticity clinics for both the general neurological population and for adults with cerebral palsy. She has also been involved in presenting a course on "Understanding Wheelchair Prescription" alongside conference workshops and presentations.

Carlee has several publications related to the measurement of postural asymmetry in adults with cerebral palsy. The translation of knowledge and research findings regarding the measurement and monitoring of postural asymmetry and the secondary consequences is a key focus area with the aim of educating clinicians and improving the lifespan care of adults living with complex disabilities.

Ginny Paleg

Ginny Paleg is a pediatric physiotherapist from Silver Spring, Maryland, USA. For the past 17 years, she has worked with children aged 0-3 years in homes and childcare. Ginny earned her master's degree in physical therapy at Emory University and her DScPT at the University of Maryland Baltimore. Ginny specializes in posture and mobility assessment and interventions for children at GMFCS Levels IV and V. She is certified in Prechtl General Movement Assessment (GMA) and the Hammersmith Infant Neurological Exam (HINE) and trained in Routines Based Interventions (McMaster) and coaching (Sheldon and Rush). She has published over 20 peer-reviewed journal articles on standers, supported stepping devices, and power mobility. She is the lead author for the American Academy of Cerebral Palsy Hypotonia Care Pathway and the Chair of the AACPDM Communications Committee. She served on the Scientific Committees for the AACPDM and EACD in 2022.

CHAIR SELECTION GUIDE

Seating Matters arjo

MOBILITY					
TRANSFER	Transfers independently or with minimal assistance. May be using a stand aid.	Needs assistance of more than one person to transfer. May be using a stand aid.	Can transfer with assistance but may need to be hoisted.	Is hoist dependent.	Is hoist dependent.
PRESSURE ULCERS	Low – medium risk.		Medium risk.	Medium – high risk. Has presence/history of a pressure injury or at risk.	Medium – high risk. Has presence/history of a pressure injury or at risk.
POSTURE	Requires minimal lateral support.		Continually sliding or falling from chair. May need legs elevated due to oedema.	Requires lateral support. Has difficulty maintaining an upright posture. Has Scoliosis either fixed or flexible.	Requires maximum lateral and head support. Has difficulty maintaining an upright posture. Has a kyphosis either fixed or flexible.
FALLS & SLIDING	Leans to the side and slides from chair.		Becomes agitated. At high risk of falls.	Needs continual postural correction.	Needs continual postural correction.
CHAIR		MILANO	MILANO / ATLANTA	MILANO - SORRENTO - ATLANTA	MILANO - SORRENTO
					

* Images courtesy of Arjo

Seating Matters
Phone: +61 1300 001 050
Email: info@seatingmatters.com.au
Website: www.seatingmatters.com.au

Arjo
Phone: 0800 000 151
Email: info.nz@arjo.com
Website: www.arjo.com

Oceania SEATING SYMPOSIUM 2021

WHANAUNGATANGA

Connecting People & Communities

SAVE THE DATE

ATSNZ Disability Expo

28 - 29 September 2022

Vodafone Events Centre, Manukau Auckland

Proudly supported by:

Auckland Unlimited

AUCKLAND TĀMAKI MAKAURAU

CALL FOR ABSTRACT SUBMISSIONS

to present at the Expo are now open!

Visit www.atsnzexpo.nz/Abstracts for further information

The ATSNZ Disability Expo will be **THE** event for showcasing products and services designed for the rehabilitation, aged care, home care markets and leisure and recreation markets.

The latest in assistive technology & how this impacts on physical & mental wellbeing.

OVER 70% of exhibition spaces sold! Don't miss out.

www.atsnzexpo.nz

Geneva Healthcare
Together for good

Geneva Healthcare is New Zealand's trusted experts in aged care, illness, injury and disability support. Since 1996, we've been supporting New Zealanders to live their best life and thrive by keeping well, living independently and staying connected with their community.

We offer real career opportunities, competitive rates, and the flexibility of permanent, part time or casual work.

We have also been recognised as a healthcare provider and recruitment company to receive the YWCA Best Practice Compact Award for proving our commitment to equal pay and gender diversity within our organisation.

Join our innovative and hardworking team of registered clinicians working with our Wellness, Disability & Rehabilitation Services.

We are looking for:

- Wheelchair & Seating Therapists
- Occupational Therapists
- Physiotherapists
- Dietitians
- Social Workers
- Registered Nurses
- Speech Language Therapists
- Rehabilitation Coaches

Please contact us to apply or for more info

Phone: 0800 GENEVA | 0800 436 382
Email: recruitment@genevahealth.com
Website: genevahealth.com

Seating to go
Pumau ki te Oranga
Part of the Geneva Healthcare Group

Geneva Healthcare

Tuesday 5TH APRIL 2022

*Subject to change

Tuesday 5th April					
8.30	**Welcome and Karakia Timatanga – Deb Wilson & Dr Taku Parai** **Opening address – Deb Wilson, NZ Chair**				
9.00	**Keynote: Amanda Lowry, Aotearoa, New Zealand** Turning the tables on brokenness, fragility, and disability through whakawhanaungatanga – community connectedness, whānau and engaging in the world. 40mins + 5mins Q&A				
9.45	**STRETCH & REFRESH**				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
10.00	**A1:** International Society of Wheelchair Professionals' (ISWP) learning modules for wheelchair service providers. (60 mins) **Amira Tawashy** **Lee Kirby** **Paula Rushton** **(Canada)**	**B1**: The rehab role of palliative care in support of women with SCI/D and breast cancer (60 mins) *Intermediate – Advanced* LIVESTREAM INTERACTIVE SESSION **Jean Minkel (USA)** **Bonita Sawatzky (Canada)**	**C1:** Blazing Trails! Assessment of all-terrain wheelchairs for off road access. (60mins) **Kendra Betz (USA)**	**D1:** The intricacies of posture, vision and mobility: The developmental trajectory of self-initiated mobility. (60 mins) **Teresa Plummer (USA)**	**E1:** Choosing the right mobility device for infants and children. (60 mins) **Ginny Paleg (USA)**
11.00	**A2:** The benefits of connected chair technology to power wheelchairs users and other stakeholders. (30 mins) **Rachel Fabiniak (Australia)** *Followed by a 30 min LIVESTREAM panel discussion with: **Karin Leire (Sweden)** **Mark Schmeler (USA)** **Fi Graham (NZ)** **Chair: Rachael McDonald (Australia)** (30mins)	**B2:** Changes with Age – Giving you the justification for custom manual wheelchairs for the geriatric client. (60 mins) **Christie Hamstra (Canada)**	**C2**: Training caregivers to assist with manual wheelchair skills: An Instructional Session. (60mins) **Lee Kirby** **Cher Smith** **(Canada)**	**D2:** Slipping and Sliding: Exploring the link between horizontal shear forces and sliding frequency. (30mins) **Bart Van Der Heyden (Belgium)**	**E2**: Applying Disability Studies and Critical Disability Theory to Mobility Technology Research: Tensions Explored, Lessons Learned (60mins) **Heather Feldner (USA)**
11.30				**D3:** Segmental Assessment of Trunk Control (SATCo) (30 mins) **Robert Norman** **Amy Bjornson** **(Australia)**	
12.00	**LUNCH & POSTERS** ***P1:*** *Whiria te tangata with Dynamic Seating - A case Study* **Victoria Cotton (New Zealand)** ***P2:*** *"He Took Off…Fast!": A Photo Narrative of Modified Ride-On Car Use by Children and Families.* **Reham Abuatiq, Heather Feldner (USA)** ***P3:*** *Trends in complex wheelchair and seating equipment provision in Tāmaki Makaurau, Aotearoa* **Maria Whitcombe-Shingler (NZ)** ***P4:*** *"We can do it together" Co-adaptation of the Wheelchair Skills Training Program for children* **Beatrice Ouellet (Canada)** ***P5:*** *Wheelchair Skill Development for a Therapy Team* **Amy Hughes, Maria Whitcombe Shingler (New Zealand)** ***P6:*** *Monitoring wheelchair tyre pressure as part of wheelchair user education.* **Bill Contoyannie, Angela Rowe, Kim Vien (Australia)**				

	Session A	Session B	Session C	Session D	Session E
13.00	**A3:** Assessment of Learning Powered mobility use – approach and application of the ALP. (90 mins) PRE-RECORD & LIVESTREAM SESSION **Lisbeth Nilsson (Sweden)**	**B3**: Finding the best available evidence - fast: A brief refresher on finding & evaluating research for the busy clinician. (90 mins) LIVESTREAM INTERACTIVE SESSION **Fi Graham (New Zealand)**	**C3**: Development and implementation of an evidence-based guideline for introducing powered mobility to infants and toddlers. (60mins) **Heather Feldner** **Teresa Plummer** **(USA)**	**D4:** 3D Printing for Seating and Mobility Dispensaries – Design and manufacturing within a clinic based format. (90mins) LIVESTREAM INTERACTIVE SESSION **Richard Pasillas** **Victor Cavente** **(USA)**	**E3**: Mobile shower commode chairs for people with larger bodies. (60mins) **Emma Friesan (Netherlands)**
14.00			**C4:** Access & Independence for Everyone – Enabling independence through power wheelchairs and alternative controls (60 mins) **Scott Staunton (Australia)**		**E4: Cubro Gold Sponsor Session** Seating and positioning – 24-hour posture care **Helen Murray** **Garry Stanners** (60mins)
14.30	**A4:** Functional Movement Disorder – where do we fit in? (30mins) **Rachel Maher (New Zealand)**	**B4**: No session at this time		**D5:** Ready to Roll: wheelchair skill development for therapists. (30 mins) **Meg Whitelaw** **Michelle Smith** **(New Zealand)**	
15.00	**STRETCH & REFRESH**				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
15.15	**A5: Medix 21 Bronze Sponsor Session:** Paediatric Seating in the Classroom and at Home	**B5: Rehasense Bronze Sponsor Session:** The challenges of power-addons for wheelchair drivers – Rehasense PAWS solutions	**C5:** No session at this time	**D6: Ottobock Bronze Sponsor Session:** Ottobock The Human Empowerment Company	**E5: Melrose Bronze Sponsor Session:** Uniquely You, Made in NZ by Melrose Chairs.
15.30	**A6:** The art and science of community mat evaluations. Toolbox tips to overcome identified barriers. (60mins) **Amy Bjornson (Australia)**	**B6**: Pressure Injuries are Ageist! Why is ageing a major risk factor for pressure injury development? (60 mins) **Rachel Fabiniak (Australia)**	**C6:** The Wheel Story: Impact of wheels and tyres on manual wheelchair performance and propulsion efficiency. (60mins) **Curt Prewitt (USA)**	**D7:** Made To Move – I Am: The use and value of seated balance based movement technology and how moving with balance can change a life. (60mins) **Marcus Thompson (New Zealand)**	**E6:** The impact of seating and positioning on respiratory system function. (60 mins) **Lois Brown (Australia)**
16.30	**A7: Invacare Gold Sponsor's session:** The Ripple Effect – Evaluation of Foam Configuration in Temperature and Moisture Control (30 mins) **Anna Sokol (Canada)**	**B7:** Wheelchair and seating solutions for people with multiple sclerosis. (30 mins) **Rachel Brown (New Zealand)**	**C7: Allied Medical Platinum Sponsor Session:** Supportive Seating: Matching prescription to provision, for all children. (30mins) **Laura Finney** **James Gilmour** **(Northern Ireland)**	**D8**: How mental health is impacted by mobility: A look into the evidence. (30 mins) **Rainy Wu (China)**	**E7: Sunrise medical Sponsor Session:** Converting Energy into Motion – Quickie Nitrum (30mins) **Amy Bjornson (Australia)**
17.00	**Finish for the day**				

WEDNESDAY 6TH APRIL 2022

*Subject to change

Wednesday 6th April					
8.30	**Welcome & today's notices – Deb Wilson, NZ Chair**				
8.40	**Plenary**: Understanding purpose in the Collision of Profession and Parenthood - **Dr Tim Adlam (UK)** (40 mins) + 5mins Q & A				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
9.30	**A8:** "Bridging the Gap" – Implementing a community therapist led wheelchair assessment clinic within inpatient rehabilitation wards. (15mins) **Angela Kennedy (New Zealand)**	**B8**: Strengthening the growth of sustainable wheelchair provision communities of practice: The bigger Picture (30mins) **Rosie Gowran (Ireland)**	**C8:** Analysing the cost of failing to include everyone in society with universal design. (15mins) **Tim Young (New Zealand)**	**D9:** Preliminary report on the development of a novel front wheel attachment for manual wheelchairs. (15mins) **Jaimie Borisoff (Canada)**	**E8:** Virtual training: connecting peers to communities through wheelchair skill education. (30 mins) **Krista Best Celine Faure Ed Griesbrecht (Canada)**
	A9: Breaking New Ground: Establishing an advanced practitioner (Wheelchair & Seating) role in Hawkes Bay. (15mins) **Antjedine Borchers (New Zealand)**		**C9:** Finite element analysis for assessment of tissue-deformation on the buttocks in the context of pressure injury. (15mins) **Carlos Kramer (The Netherlands)**	**D10: Arjo Bronze Sponsor session** The effectiveness of clinical, therapeutic seating after the Covid-19 pandemic for long term care patients. (15 mins) **Martin Cominotto (Australia)**	
10.00	**STRETCH & REFRESH**				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
10.15	**A10:** Where is the Pelvis? Where is the Head? An advanced look at postural support. (60 mins - LIVESTREAM) **Jean Minkel (USA)**	**B9**: From idea to innovation – a practical session on problem solving, design, disability and innovation. (2 hours LIVESTREAM INTERACTIVE WORKSHOP) **Tim Adlam Louisa Cotton Roxana Ramirez-Herrera (UK)**	**C10:** Kick the Tyres! Evaluating wheeled mobility devices for performance & safety. (60 mins) **Kendra Betz (USA)**	**D11:** The paediatric powered wheelchair standing device: a historical perspective. (60 mins) **Lisa Kenyon (USA) Bonita Sawatzky (Canada)**	**E9:** A pilot study comparing postural and functional skills in supportive vs. unsupportive Wheelchair Backs (60 mins) **Jessica Pedersen (USA) Cynthia Smith (USA)**
10.30					
10.45					
11.00					
11.15	**STRETCH & REFRESH**				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
11.30	**A11: C1 South Gold Sponsor Session** Facing Forward – What's Up with Head and Neck Supports (60 mins) **Stephanie Tanguay (USA)**	**B9: Continued:** From idea to innovation – a practical session on problem solving, design, disability and innovation. (2 hours LIVESTREAM INTERACTIVE WORKSHOP) **Tim Adlam Louisa Cotton Roxana Ramirez-Herrera (UK)**	**C11: No session at this time**	**D12**:Complex wheelchair and seating positioning: The postural assessment process! (60mins) **Joana Santiago (Australia)**	**E10**: Tales from the field: Using fully customised seating products. (15mins) **Jenni Dabelstein (Australia)**
11.45					**E11**: Novel method of propulsion pattern recognition in a manual wheelchair simulator. (15mins) **Salman Nourbakhsh (Canada)**

12.00					**E12:** Perceived access to livelihoods among spinal cord injury individuals in Tanzania following Motivation Peer Training (15mins) **Annabelle de Serres-Lafontaine (Canada)**
12.15					**E13:** Longitudinal analysis of OT students' participation in a wheelchair skills boot-camp. (15mins) **Ed Giesbrecht (Canada)**
12.30	**LUNCH & POSTERS** ***P7:*** *Blind spot sensor systems for power-wheelchairs.* **Alice Pellichero (Canada)** ***P8:*** *Getting in Trouble Together: Use of Assistive Technology to Facilitate Toddler Participation* **Rachel Maher (New Zealand)** ***P9:*** *Evaluating clinical outcomes of modular wheelchair seating solutions in Muscular Dystrophy: a case study* **Bridget Churchill (UK)** ***P10:*** *Meeting Changing Seating Needs Post Hip surgery.* **Tracee-lee Maginnity (Australia)** ***P11:*** *Use of Virtual Boundaries to Facilitate Safer Community Access: A Case Study of Customisation* **Sandra Malkin, Richard Sutton (Australia)**				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
13.30	**A12:** Supporting psychological wellness in children and families with disabilities / medical conditions: reflections from paediatric practice. (90 mins) LIVESTREAM INTERACTIVE SESSION **Nicola McDonald Helen Thorne (New Zealand)**	**B10**: Moving towards guided self-assessment and personal budgets for seating and mobility equipment: Through the lens of Enabling Good Lives. (90m mins) LIVESTREAM INTERACTIVE SESSION **NZ Ministry of Health, Mana Whaikaha and Enable NZ. (New Zealand)**	**C12:** Exploring power mobility use – a learning approach for children and adults with cognitive impairment. A focus on the early phases of the learning process. (90 min workshop) PRE-RECORD & LIVESTREAM SESSION **Lisbeth Nilsson (Sweden)**	**D13:** Time for a Switch: The evaluation of non-proportional drive controls. (60 mins) **Jay Doherty (USA)**	**E14: Permobil Platinum Plus Sponsor Session:** Understanding the Design of Manual Wheelchairs from an Engineer's Perspective. (60 mins) **Sam Baker (Australia)**
14.30				**D14:** Physical risk factors influencing wheeled mobility in children with cerebral palsy (15mins) **Jackie Casey (UK)**	**E15:** Use of activity chairs/standing aids by people with disabilities: results from a Master thesis. (15mins) **Naja Tidemann (Denmark)**
14.45				**D15:** Power-wheelchair users with severe cognitive impairment can improve their capacities (15mins) **Alice Pellichero (Canada)**	**E16:** Tales from the field: My love affair with smart electronics (15mins) **Jenni Dabelstein (Australia)**
15.00	**STRETCH & REFRESH**				

	Session A	Session B	Session C	Session D	Session E
15.15	**A13:** Supporting the growth and development of wheelchair and seating therapists: a coaching approach. (60 mins) **Maria Whitcombe-Shingler** **Alexandra Haydon** **(New Zealand)**	**B11: Permobil Platinum Plus Sponsor Session** Smart Drive: New Updates and their Clinical Applications – (60mins) **Sam Baker** **Rachel Fabiniak** **(Australia)**	**C13:** The measurement of postural asymmetry in non-ambulant adults with cerebral palsy. (60 mins) **Carlee Holmes** **(Australia)**	**D16: Permobil Platinum Plus Sponsor Session:** Introducing the New ROHO Hybrid Select (60mins) **Terri Davies** **Rachel Maher** **(New Zealand)**	**E17:** Listening to Their Voices: Children's and families' perspectives of power mobility use. (60 mins) **Lisa Kenyon (USA)**
16.15 **16.30**	**A14:** Can user centred design be used to develop assistive technology? Testing a framework for collaboration. (60 mins) **Hana Phillips** **Gianni Renda** **Rachael McDonald** **(Australia)**	**B12:** Get me out of here: Manual wheelchair power add on devices. (60 mins) **Mitchell Stone** **(Australia)**	**C14**: Night- time positioning: Systematic approach to successful outcomes. (60 mins) **Joana Santiago** **(Australia)**	**D17:** No session at this time	**E18**: Considerations for Determining Optimal Manual Wheelchair Configuration – what are the "non-negotiables"? (60 mins) **Deb Wilson** **Sandie Grant** **(New Zealand)**
17.15 **17.30**	**GRAB A DRINK & NIBBLES FOR A MIX & MINGLE** **WHEELCHAIR TRIVIA QUIZZ LED BY Prof Rachael McDonald – be in to win an OSS registration for Melbourne 2023.**				

THURSDAY 7TH APRIL 2022

Thursday 7th April					
7.00 – 8.00	Learn how the International Society of Wheelchair Professionals (ISWP) can help you! Breakfast session facilitated by **ISWP – Registration link will be sent to all delegates. A zoom link will be sent via ISWP to those who have registered.**				
8.30	**Welcome & Open Address** – 10mins				
8.40	**Plenary: Mobility Equity – Jean Minkel (USA)** 40mins + 5 mins Q&A				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
9.30	**A15: Sunrise Medical Gold Sponsor Session:** Quickie Q500 M Mini - Come learn about the ultra-compact power wheelchair that's packed with BIG performance. (30mins) **Amy Bjornson (Australia)**	**B13:** An overview of wheelchair provision education in Canadian occupational therapy programmes. (15mins) **Paula Rushton** **Ed Giesbrecht** **(Canada)**	**C15:** Postural asymmetries, pain, and ability to change position of children with cerebral palsy. (15mins) **Jackie Casey (UK)**	**D18**: Choosing cushion protection over skin protection?! (15mins) **Carlos Kramer** **(Netherlands)**	
9.45		**B14**: The design requirements of a telehealth wheelchair and seating assessment service for Aotearoa: A mixed methods analysis of stakeholder views. (15mins) **Fi Graham** **(New Zealand)**	**C16:** Their voices: What caregivers say about sleep systems for their children. (15mins) **Jane Hamer** **(New Zealand)**	**D19**: COVIDisruption: evolving home-based MWC skills training to full telerehabilitation delivery (15mins) **Ed Giesbrecht** **Krista Best** **(Canada)**	
10.00	**STRETCH & REFRESH**				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
10.15	**A16:** Using power mobility as a therapeutic intervention to support development and learning across the lifespan. (60 mins) **Lisbeth Nilsson (Sweden)** **Lisa Kenyon (USA)**	**B15**: Wheelchair Educators' Package: A tool to enhance wheelchair education globally. (60 mins) LIVESTREAM SESSION **Paula Rushton (Canada)** **Mary Goldberg (USA)** **Yohali Burrola-Mendez (Canada)** **Jon Pearlman (USA)** **Sara Munera (USA)** **Rosie Gowran (Ireland)** **Deb Wilson (New Zealand)**	**C17: :** How do people actually use their manual wheelchairs, and what really matters? (60 mins) **Curt Prewitt (USA)**	**D20:** Strategies for online training in seating & mobility complimented with telehealth. (60mins) **Mark Schmeler** **Madelyn Betz** **(USA)**	
11.15	**STRETCH & REFRESH**				
11.30	**A17: Allied Medical Platinum Sponsor Session:** Think Lego, a constructive approach for paediatric mobility (30mins) **Eric Van Olst** **(The Netherlands)**	**B16**: The seat cushion micro climate: Surface temperature, moisture and humidity - Effects on skin integrity. (30mins) **Amy Bjornson (Australia)**	**C18: Allied Medical Platinum Sponsor Session** Vibration's Effect on a Manual Wheelchair User (30mins) **Curt Prewitt (USA)**	**D21: Invacare Gold Sponsor Session:** Amplify the push – Using manual wheelchairs without strain and pain. (30mins) **Michael Urso** **(Germany)**	

12.00 – 13.00	LUNCH				
	Session A	**Session B**	**Session C**	**Session D**	**Session E**
13.00 **13.30**	**A18:** Diversifying Standing Opportunities for Children: Clinically reasoning the options and justifying their funding. (60 mins) **Jamie Cockle (Australia)**	**B17:** Culturally safe practice in Aotearoa New Zealand as a Wheelchair and Seating Therapist. (60mins) **Jazz Fox** **Liz Turnbull** **(New Zealand)**	**C19:** Balancing the options – Managing Pelvic Obliquity in Seating (60 mins) **Angela Rowe** **Kim Vien** **(Australia)**	**D22:** Understanding the lifespan postural issues of non-ambulant adults with CP, as measured with the Goldsmith Indices of Body Symmetry. (60 mins) **Carlee Holmes (Australia)**	
14.00	**A19: Allied Medical Platinum Sponsor Session:** A New Frontier: Introducing the Quantum 4Front 2. (30mins) **Jay Doherty (USA)**	**B18:** Can the prescription of a mobility device facilitate increased connection to one's community? (30mins) **Tracee-Lee Maginnity (Australia)**	**C20**: Making a success of custom moulded seating. (30mins) **Kate Pain (Australia)**	**D23**: Managing Forces in Active Bodies. Dynamic seating from theory to practice. (30 mins) **Amy Bjornson** **Robert Norman** **(Australia)**	
14.30	**Closing Keynote: Prof Rachael McDonald** *(Australia)* **Innovation or Improvement? What is the potential for the Fourth Industrial Revolution (Industry 4.0) to influence the lives of people living in wheelchairs?**				
15.10 – 15.30	**Upcoming events from our partners:** *(1min overview)* **ATSNZ** **ARATA** **ISS Pittsburgh** **OSS 2023** **Farewell and Karakia Whakamutunga - Deb Wilson & Dr Taku Parai**				

15%
OFF

Affordable Wheelchairs & Homecare Products

Call us today

0800 55 55 88 | info@privatecarenz.com | privatecarenz.com

Private Care NZ
making every day easier

Freedom from worry with Freedom Medical Alarms

Connect to emergency medical assistance at the push of a button. The gift of freedom from worry could be fully funded if eligible.

Talk to our team to learn more. Call us on 0800 380 280 today.

Freedom Medical Alarms

0800 380 280 | info@freedomalarms.co.nz | freedomalarms.co.nz

ABSTRACTS

TUESDAY 5TH APRIL 2022

KEYNOTE: Turning the tables on brokenness, fragility, and disability through whakawhanaungatanga – community connectedness, whanau and engaging in the world.

Amanda Lowry

Abstract

A new life began the moment I broke my neck. A new life, not only for me, but for my young family too. In this uncharted territory, we struggled to visualise how we were going to connect and engage with each other – our whanau, the environment and friends. The role of the mobility and seating community was vital, in helping us negotiate this new terrain. For many whanau, disability (congenital or impaired) brings with it, trauma, pain and fear. In your mahi (work) you pay attention to what is important to the whanau (people and families) that you work with, gradually introducing us to the strange world of mobility equipment. The innovations and technologies of assistive devices underpin 'how' we are to be in the world. They create opportunities for engagement in the built and natural environment – with friends and whanau in ways we never thought possible. For your awhi (care) we are grateful!

Yet, there is inequality embedded within this korero (conversation). There are different systems within countries and between countries. Some of us are provided with all the equipment and support that need, whereas others have to fight, petition and pay to access the equipment that will enable them to have a life – not necessarily a good life, but a life.

Engagement with disability heightens the awareness that disabled lives are shaped not only by structural and social barriers but exclusion and inequality. The mobility and seating community are changemakers. You respond to need, driving innovation and sharing knowledge to ensure that the disabled population have access to the latest life changing technologies. These technologies enable us to engage and contribute to our families and communities. They allow us to be comfortable in our bodies; to move through the world; to access nature, to swim, climb and play. For many of us, you are very important people in our disability stories, helping us reclaim what we thought was lost; our freedom and opportunities to feel fully human.

Speaker Biography

Amanda broke her neck eight years ago in a surfing accident. The accident, that rendered her a tetraplegic, set her life on a new trajectory. Post – injury she slowly began to build a new life with her young family finding innovative ways to do the things she loved. Amanda got back in the water and spent two years learning to move her body and swim again. She started playing wheelchair rugby and found the freedom and joy of competitive sport, and connected with a fabulous community that helped her negotiate the realities of her new body. Both swimming and wheelchair rugby offered Amanda high-performance opportunities, she chose swimming. There has never been an athlete with her level of impairment ever swim for

New Zealand. Amanda believes that involvement in sport is transformational and is currently working towards a PhD examining welfare and care in high-performance disability sport. Prior to her accident she had received a Masters SocSc for her work on Māori State engagement. She works with several not-for-profit organisations in the disability sector. Her research interests examine the structures and institutions that underpin the exclusion of minority groups.

A1: International Society of Wheelchair Professionals' (ISWP) learning modules for wheelchair service providers.

Ms. Amira Tawashy[1], Ms. Sara Munera[2], Ms. Krithika Kandavel[2], Dr. Mary Goldberg[3], Dr. Lee Kirby[4], Dr. Paula Rushton[5], Ms Samantha Shann[6]
[1]Dalhousie University, Halifax, Canada. [2]International Society of Wheelchair Professionals (ISWP), Pittsburgh, USA. [3]University of Pittsburgh, Pittsburgh, USA. [4]Nova Scotia Health Authority, Halifax, Canada. [5]University of Montreal, Montreal, Canada. [6]World Federation of Occupational Therapists, Newcastle, United Kingdom
Ms. Amira Tawashy, Occupational Therapist
Ms. Sara Munera,Technical Coordinator
Ms. Krithika Kandavel, Research and Training Coordinator
Dr. Mary Goldberg, Associate Professor
Dr. Lee Kirby, Physician
Dr. Paula Rushton, Associate Professor
Ms Samantha Shann, President

Learning objectives

1. Describe the content of the International Society of Wheelchair Professionals (ISWP) modules, including similarities and differences from 2012 World Health Organization (WHO) Wheelchair Service Training Package (Basic Level);
2. Discuss the development process of the ISWP modules;
3. Provide feedback on the content and development process

Abstract

The WHO estimates that less than 20% of the 100 million people in the world who need a wheelchair have access to an appropriate one that meets their needs. Inappropriate wheelchair service provision has adverse effects on safety, health, and other basic human rights. Limited training allocated to wheelchair service provision contributes to inappropriate wheelchair service delivery.

The ISWP has a mission to serve as a global resource to wheelchair service standards and provision through education and information exchange. In its aim to professionalize wheelchair services around the world, ISWP promotes the WHO Guidelines on providing manual wheelchairs in less resourced settings. Expert opinion provided the basis for these guidelines and related WHO educational packages that have been the primary basis of ISWP's hybrid training (part on-line, part in-person) of wheelchair service providers. The Integration Committee of the ISWP was charged with reviewing the content of the Basic Package with a view to making any necessary revisions to ISWP materials to reflect updated knowledge and practice. As such, the ISWP has integrated current literature and evidence-based guidelines into the ISWP materials to create an up-to-date online, interactive learning experience. This process was completed in an iterative manner through consensus of an international group of content experts. The ISWP's online modules can be used either through instructor facilitation or asynchronous self-study.

This session will provide information on the development and content of the updated ISWP learning resources for wheelchair provision. The participants will explore select on-line modules and be encouraged to discuss the process and content with questions and comments in both small and large group discussions.

Content references

1) Toro ML, Eke C, Pearlman J. The impact of the World Health Organization 8-steps in wheelchair service provision in wheelchair users in a less resourced setting: a cohort

study in Indonesia. BMC Health Serv Res. 2016 Jan 22;16:26. doi: 10.1186/s12913-016-1268-y. PMID: 26801984; PMCID: PMC4722611.

2) Fung K, Miller T, Rushton PW, Goldberg M, Toro ML, Seymour N, Pearlman J; International Society of Wheelchair Professionals. Integration of wheelchair service provision education: current situation, facilitators and barriers for academic rehabilitation programs worldwide. Disabil Rehabil Assist Technol. 2020 Jul;15(5):553-562. doi: 10.1080/17483107.2019.1594408. Epub 2019 Apr 23. PMID: 31012755.

3) Keeler L, Kirby RL, Parker K, McLean KD, Hayden JA. Effectiveness of the Wheelchair Skills Training Program: a systematic review and meta-analysis. Disabil Rehabil Assist Technol. 2019 May;14(4):391-409. doi: 10.1080/17483107.2018.1456566. Epub 2018 Apr 4. PMID: 29616832.

4) Guidelines on the Provision of Manual Wheelchairs in Less Resourced Settings. Geneva: World Health Organization; 2008. PMID: 23785745.

Presenter biography

Amira Tawashy is an occupational therapist with a special interest in wheelchair provision – particularly in under resourced settings. She has over 15 years of clinical rehabilitation experience working with individuals who have sustained spinal cord injuries and traumatic brain injuries. Amira currently teaches in the Occupational Therapy program at Dalhousie University and travels with the Walkabout Foundation to provide wheelchairs and wheelchair education to individuals living in Eastern Africa.

R. Lee Kirby received his MD degree from Dalhousie University in Halifax, Nova Scotia, Canada. His specialty training in Physical Medicine and Rehabilitation was carried out at the University of Washington in Seattle, Washington, USA, at Dalhousie University and at Stoke Mandeville Hospital in England. He is a Professor in the Division of Physical Medicine and Rehabilitation in the Department of Medicine at Dalhousie University with a cross-appointment in Community Health and Epidemiology. His primary research interest is the safety and performance of wheelchairs. He has held research grants from a number of national and international funding bodies. He has authored or co-authored 2 books and 168 papers in peer-reviewed journals. His Google Scholar profile notes 6,199 citations. He heads the team that developed the Wheelchair Skills Program, a low-tech, high-impact training program that is relevant for both more- and less-resourced settings.

Paula Rushton is an Associate Professor in the School of Rehabilitation, Occupational Therapy Program at the University of Montréal and a researcher at the CHU Ste-Justine Research Center. Her research is focused on measurement, intervention, knowledge translation and education related to improving the wheeled mobility of both adults and children through an improved wheelchair service provision process. From the measurement, intervention and knowledge translation perspective, Rushton's expertise lies in the domains of wheelchair skills and wheelchair confidence. From the education perspective, Rushton has been working with the International Society of Wheelchair Professionals to enhance wheelchair content in health care professional university curricula globally.

A2: The Benefits of Connected Chair Technology to Power Wheelchairs Users and Other Stakeholders

Rachel Fabiniak
Permobil, Sydney, Australia
Director of Clinical Education - Asia Pacific

Karin Leire
Permobil, Stockholm, Sweden
Vice President Research and Innovation

Learning objectives

1. Describe 2 examples about how data from connected chair technology can benefit wheelchair users, carers or clinicians.
2. Discuss 2 examples about how data from connected chair technology can benefit technicians, manufacturers, researchers or policy makers.
3. Explain 1 way how connected chair technology could be used in your practice.

Abstract

Knowledge on wheelchair users is generally derived from smaller heterogeneous samples. Big data are available via connected chairs and have great potential to extend this knowledge. This course will discuss the benefits of using connected data for different stakeholders by giving examples of how these data are being used.

Currently there are 6000 power wheelchair users connected. From these data, two types of insight can be distinguished: performance insights about how technology is functioning and behaviour insights about how technology is being used. Several functionalities can be analysed, such as the distance driven, battery health, the use of elevation, tilt, recline and standing functions.

Stakeholders that can benefit are:

1) Wheelchair users and carers: from having information about how they are using their chair via apps that show how long they can drive with the current battery status or when there is an error and may need service.

2) Clinicians: can follow-up with clients on how much they are using their power seat functions to access identified key positions.

3) Service technicians: can utilise a proactive service delivery model with insights that decrease the risk of wheelchair breakdown and decrease the amount of wheelchair downtime if a repair is needed.

4) Wheelchair manufacturers: can use data to inform the design of new products. For example, by analysing the most common combination of actuator angles used in standing, manufacturers can set the optimal ranges for new wheelchairs.

5) Researchers: using connected data in collaborative projects can be linked to clinical data, results from other measurements or to document compliance in interventions.

6) Policy makers: data showing evidence for the benefits of power wheelchair use can inform insurance policy coverage decisions.

Content references:

1) Althoff T, Sosič R, Hicks JL, King AC, Delp SL, Leskovec J. (2017) Large-scale physical activity data reveal worldwide activity inequality. *Nature*. Jul 20;547(7663):336-339.
2) Dicianno B. E., Morgan A., Lieberman J., & Rosen L. (2016). Rehabilitation Engineering & Assistive Technology Society (RESNA) position on the application of wheelchair standing devices: 2013 current state of the literature. *Assistive Technology*, vol. 28, Issue 1, pp. 57–62.
3) Magasi S, Wong A, Miskovic A, Tulsky D, Heinemann AW (2018). Mobility

Device Quality Affects Participation Outcomes for People with Disabilities: A Structural Equation Modeling Analysis. Arch Phys Med Rehabil. Jan;99(1):1-8

FOLLOWED BY 30 MIN LIVESTREAM PANEL DISCUSSION

What is the current and potential for 'data'?

Karin Leire (Sweden)
Mark Schmeler (USA)
Fi Graham (NZ)
Chair: Rachael McDonald (Australia)

Learning objectives

1. To identify where data is or can be routinely collected and stored
2. To discuss ethical, privacy and other issues around data collection and storage
3. To understand the potential and limitations of data.

Presenter biography

Rachel Fabiniak began her studies at The Georgia Institute of Technology, where she graduated with her Bachelor of Science in Biology in 2009. Rachel then went on to receive her Doctorate in Physical Therapy from Emory University in 2013.After receiving her doctorate, Rachel went into clinical practice as a physiotherapist in the Spinal Cord Injury Day Program at Shepherd Center in Atlanta, Ga. There she developed a passion for seating and mobility which ultimately led to her career with Permobil in 2018. In 2020, Rachel became Director of Clinical Education for Asia-Pacific.

Karin Leire has got a master's degree in biomedical sciences from University of Uppsala, Sweden. She has got a 20-year experience in clinical research and evidence-based medicine for both pharmaceuticals and medical devices. She is currently the Vice President of Research & Innovation at Permobil group, defining and leading the research roadmap, gathering customer insights from direct interactions with stakeholders and large datasets from the connected

Mark Schmeler is an Associate Professor and Vice Chair for Education & Training in the Department of Rehabilitation Science & Technology at the University of Pittsburgh. He oversees all aspects of the graduate training curriculums and continuing education in the field of Assistive Technology. He is also an Occupational Therapist and Assistive Technology Professional with over 30 years of experience. He continues to practice part-time at the Center for Assistive Technology at the University of Pittsburgh Medical Center where he also serves as Interim Director. His area of research is focused on clinical outcomes and service delivery models to foster evidence-based practice and equitable policy for access to products and services. He has published several peer-reviewed articles and position papers related to tool development, registries, telehealth, and best-practices in Assistive Technology.

Fiona Graham is a Senior Lecturer with the University of Otago teaching postgraduate interprofessional rehabilitation. Her research areas include telehealth in rehabilitation, knowledge translation and participation focused interventions, particularly for paediatric populations. She resides in Christchurch, New Zealand.

Rachael McDonald is clinical, teaching and research professor who aims to conduct research with people with disabilities to support and enable participation as well as educate the health professionals of the future. This is done by focussing on collaborative multidisciplinary research and teaching, concentrating on emerging areas of health, technology and emerging technologies and identifying, and addressing barriers.

They have over 100 publications, and attracted over $10million in research funding, and supervised 29 research students.

B1: The Rehab Role of Palliative Care in support of women with SCI/D and Breast Cancer

Jean Minkel
Independence Care System, Brooklyn, NY, USA
Dr Bonnie Sawatzky, PhD
Associate Professor, Department of Orthopaedics
International Collaboration on Repair Discoveries (ICORD)
University of British Columbia, Canada

Learning objectives

Upon completion of this workshop, participants will be able to:

1. Define the differences between Palliative Care and Hospice Care.
2. List the four domains of inquiry when following the principles of a Palliative System of Care.
3. Define the physical, psychological, spiritual and support / care partner impact of Breast Cancer treatment on women with a SCI/D

Abstract

The U.S. National Consensus Project for Quality Palliative Care defines palliative care as: “Beneficial at any stage of a serious illness. Palliative care is an *interdisciplinary* care delivery system designed to anticipate, prevent, and manage physical, psychological, social, and spiritual suffering to optimize quality of life for patients, their families and caregivers. Palliative care can be delivered in any care setting through the collaboration of many types of care providers"

What are ‘palliative care concerns”?
These concerns are patient specific and can only be identified when there has been an honest and direct conversation exploring the patient’s strengths and suffering in the areas of:

- Physical Health and Functioning
- Psychological Health and Functioning
- Social Needs and Available Supports
- Spiritual Needs and Supports

A thoughtful inquiry, through unhurried conversation(s), into these four domains of a person’s life, is essential in ordered to be aware of and mindful of the person’s quality of life. Equally valued in the Palliative Care philosophy, is an inquiry into and support of the quality of life of the client’s families and caregivers; who are often bearing a large burden; too often without adequate support.
This workshop will present the components of the Palliative model of care followed by the application of this model via an interview. Dr. Sawatzky will share her lived experience of being a woman with an SCI/D and a diagnosis of breast cancer, along with her research knowledge of SCI/D. Participants will be guided through some of the common secondary impairments experienced by breast cancer survivors and their additional impact on function and well-being of women with SCI/D. Participants will see that palliative care through an interdisciplinary approach. This includes accessing rehab therapies and devices to assist in functioning, as well as mental health and social supports to optimize outcomes.

Content references

1) Sawatzky B, Edwards C, Walters-Shumka A, Standfield S, Shenkier T, Harris S. A Perspective on Breast Cancer in Women with Spinal Cord Injuries. *Spinal Cord* 2021. DOI: 10.1038/s41393-021-00628-2

2) Comprehensive Palliative Care in MS: CMSC Consensus Statement and Proposed Guidelines. https://www.mscare.org/page/palliative

3) Kluger BM, Persenaire MJ, Holden Sk, et al. Implementation issues relevant to outpatient neurological palliative care. *Ann Pall Med.* 2018; 7(3)339-348.

4) Hidding JT, Beurskens CH, van der Wees PJ, van Laarhoven HW, Nijhuis-vander Sanden MW. Treatment related impairments in arm and shoulder in patientswith breast cancer: a

systematic review. *PLoS One*. 2014;9:e96748 https://doi.org/10.1371/journal.pone.0096748.

5) Gross SE, Pfaff H, Swora M, Ansmann L, Albert U, Gross-Kinkel A Healthdisparities among breast cancer patients with/without disabilities in Germany. *Disability Health J.* 2020; 13. https://doi.org/10.1016/j.dhjo.2019.100873.

6) de Padua AL, Strickland K, Patrick M, Ditunno JF. Spinal cord injuredwomen's treatment of breast carcinoma: alert to complications. *Spinal Cord Ser Cases.* 2018;4:46.

Presenter biography

Ms. Minkel is a physical therapist and master clinician well recognized for her work in Assistive Technology. She is currently the Senior Vice President at ICS - Independence Care System, a not for profit, care management agency for persons living with a physical disability in New York City; where she also leads the, *On A Roll* seating clinic. Jean has been an invited keynote speaker at conferences in the US, Canada, Australia, New Zealand and Japan. She is a published author, including many peer reviewed journal articles and most recently, she co-edited, with Michelle Lange, the newly published textbook, Seating and Wheeled Mobility – a Clinical Resource Guide. The A.T. community has recognized Jean for her contributions by awarding to her, the RESNA Fellow award in 1995 and the Sam McFarland Mentor Award in 2012.

Bonita Sawatzky is an Associate Professor in the Department of Orthopaedics at the University of British Columbia. Dr. Sawatzky has worked extensively with people with spinal cord injury, including traumatic and non-traumatic populations, as well as adults and children. The focus of her research has been to find ways to make mobility easier and more efficient for those with spinal cord injuries with over 80 peer reviewed publications. She aims to develop a better understanding of the biomechanics of mobility and identifying ways to educate individuals on how to walk or wheel more effectively. In addition, Dr. Sawatzky has begun to explore more specifically issues related with ageing such as technologies and training for older populations, as well as understand functional changes with ageing of individuals with rare neuro/orthopaedic conditions. She worked with the Vancouver ISS committee for 18 years and now enjoying working with the OSS organizing committee!

B2: Changes with Age – Giving You the Justification for Custom Manual Wheelchairs for the Geriatric Client

Dr Christie Hamstra
Motion Composites, St. Roch de l'Achigan, Canada
Clinical Education Specialist

Learning objectives

1. Discuss two musculoskeletal changes associated with the normal aging process.
2. Describe two distinct adjustments to a manual wheelchair to counteract changes seen in a geriatric client.
3. Explain two justification rationales where the geriatric client would benefit from an ultralightweight wheelchair

Abstract

The elderly client can be easily overlooked as one who could benefit from a custom fitting or adjustable manual wheelchair. They are too often provided the "basic" wheelchair without much thought on the part of the clinician because it requires little to no work to justify. The normal aging process causes losses in strength and muscle mass, decreased ROM, and postural changes. These normal aging decreases can be intensified by disease processes that require wheelchair dependence. Having a manual wheelchair that can be custom fit in all aspects including seating will give the user optimum positioning for function.

Decreased overall strength, especially in upper extremities, including loss of muscle mass is well documented as an age-related change. Increases in kyphosis, and other postural changes, combined with decreased strength along with disease processes can make self-propelling a manual wheelchair difficult for an elderly client, if not placed in optimum position. The geriatric population is often overlooked as a group requiring custom fitting or modifications, and they end up with poorly fitting, poorly performing equipment, which as a result can lead to decreased mobility, increased morbidity and even mortality.

This session with look at normal physiological changes that come with aging, and how proper wheelchair seating, base selection, fitting, and set up, can and should be justified for the geriatric client. One size fits all should not be used for a geriatric client who will utilize the wheelchair for an extended period of time (most likely longer than 6 months). A custom manual wheelchair, fit to client specifics can provide optimum outcomes and hopefully better quantity and quality of life for the geriatric client.

Content references:

1) Goda, H., Hatta, T., Kishigami, H., Suzuki, A., & Ikeda, T. (2015). Does a Novel-Developed Product of Wheelchair Incorporating Pelvic Support Prevent Forward Head Posture during Prolonged Sitting? Plos One, 10(11). doi: 10.1371/journal.pone.0142617
2) Vidt, M. E., Daly, M., Miller, M. E., Davis, C. C., Marsh, A. P., & Saul, K. R. (2012). Characterizing upper limb muscle volume and strength in older adults: A comparison with young adults. Journal of Biomechanics, 45(2), 334–341. doi: 10.1016/j.jbiomech.2011 .10.007
3) Fukumoto, Y., Ikezoe, T., Yamada, Y., Tsukagoshi, R., Nakamura, M., Takagi, Y., … Ichihashi, N. (2015). Age-Related Ultrasound Changes in Muscle Quantity and Quality in Women. Ultrasound in Medicine & Biology, 41(11), 3013–3017. doi: 10.1016/j.ultrasmedbio.2015.06.017

Presenter biography

Christie Hamstra is a Clinical Education Specialist with Motion Composites and has experience as both a Physical Therapist in

seating clinic and ATP as a supplier in the area of seating and mobility and wheelchair prescriptions. Christie received her Masters of Science in Physical Therapy from Andrews University, and a transitional Doctorate of Physical Therapy from Oakland University, and yearly teaches complex rehab technology to current students. As Christie has worked in many settings, she enjoys sharing her expertise and passion with fellow clinicians. Christie has provided education in multiple areas of the United States and Canada, and has presented at The European Seating Symposium, The Canadian Seating and Mobility Conference, and The International Seating Symposium.

C1: Blazing Trails! Assessment of All-Terrain Wheelchairs for Off Road Access

Kendra Betz
University of Pittsburgh, Denver, USA
Physical Therapist

Learning objectives

At the end of the session, participants will be able to:

1. Describe three enhanced features of wheeled mobility devices that support access to off-road and extreme terrain environments.
2. Discuss three limitations of wheeled mobility devices designed for all-terrain performance.
3. Review two reasons that consumer cognition and problem solving are critical for safe use of an all-terrain mobility device.

Abstract

Wheeled mobility devices with enhanced function that are intended for off-road or extreme-terrain access are commercially available and pursued by individuals with mobility impairment. Many people pursue an all-terrain wheelchair for recreational pursuits such as hiking, hunting, fishing, golf, or beach access. Others are interested in unique wheelchair features to access personal property, perform yard maintenance or animal care tasks, for farm/ranch work or to just “go for a walk” on terrain that cannot be accessed from their usual wheelchair. For some, an enhanced function wheelchair is appealing for vocational or volunteer work, community participation or hobby interests. While many products offer highly exceptional features that support access otherwise inaccessible environments, objective assessment of the wheeled mobility device and comprehensive evaluation of the wheeled mobility user is critical for determining reliable performance, durability and consumer safety. Common wheelchair provision considerations carry exceptional implications for enhanced function wheelchairs including specific device characteristics, customization options, power seat function capability, controller features, transportation and storage requirements, and interface with other assistive technologies. The consumer evaluation must include cognition, risk management and problem solving abilities in addition to physical, sensory and functional assessment. This session will empower participants with a framework for evaluating all-terrain mobility devices to support an accurate and meaningful assessment of potential benefits and possible limitations for clients who use wheelchairs. Case examples with action photos and video will be utilized to emphasize key points, and audience participation will be facilitated to support a thorough review of the topic. Discussion points will include application of established international test standards, relevance of current published literature and needs for further study, product regulation and coding, funding options, ethical considerations and essential consumer education and training to optimize safety and mitigate risks associated with enhanced function mobility device compromise or failure.

Content references

1) Mhatre A, Martin D, McCambridge M, Reese N, Sullivan M, Schoendorfer D, Wunderlich E, Ruchman C, Mahilo D, Pearlman J. Developing product quality standards for wheelchairs used in less-resourced environments. *African J of Disability*. 2017.

2) Kirby RL, Miller WC, Routhier F, Demers L, Mihailidis A, Polgar JM, Rushton PW, Titus L, Smith C, McAllister M, Theriault C, Thompson K, Sawatzky B. Effectiveness of a Wheelchairs Skills Training Program for Powered Wheelchair Users: A randomized controlled trial. *Arch Phys Med Rehabil*. 2015; 96 (11): 2017-26.

3) Toro ML, Worobey L, Boninger MD, Cooper RA, Pearlman, J. Type and frequency of reported wheelchair repairs and related adverse consequences among people with spinal cord injury. Arch Phys Rehabil. 2016; 97(10):1753-60.

4) Hogaboom NS, Worobey LA, Houlihan B, Heinemann A, Boninger M. Wheelchair breakdowns are associated with pain, pressure injuries, rehospitalization, and self-perceived health in full-time wheelchair users with spinal cord injury. *Arch of Phys Med Rehabil*. 2018 Oct;99(10): 1949-1956.

5) Betz K, Dicianno B, Pearlman J, Karg T, Mandala M, Jacobs K, Bagian T. Clinical Limits of Use Tools (CLOUT) for Wheeled Mobility Devices. February 2018. www.ncps.va.gov/professionals/publications/CLOUT.asp

Presenter biography

Kendra Betz is a Physical Therapist and RESNA Assistive Technology Professional who is speaking at OSS as adjunct faculty for the University of Pittsburgh. She has also worked for the Veterans Health Administration in the USA since 1993. Kendra's areas of clinical specialization include SCI rehabilitation, assistive technology, adaptive sports, and patient safety. Kendra teaches regularly at national and international forums, leads national projects for medical device evaluation and has developed innovative programs to provide specialized support for adaptive athletes. Her expertise is recognized in the USA by induction into the National SCI Association Hall of Fame, the Air Force Association's Employee of the Year Award, and the Clinical Excellence and Distinguished Lecture Awards from the Academy of SCI Professionals.

C2: Training Caregivers to Assist with Manual Wheelchair Skills: An Instructional Session

R. Lee Kirby[1], Cher Smith[2]
[1]Dalhousie University, Halifax, Canada. [2]Nova Scotia Health, Halifax, Canada
R. Lee Kirby, Professor
Cher Smith, Occupational Therapist

Learning objectives

On completion of this workshop, attendees will be able to:

1. Describe how to safely and effectively perform a set of 23 wheelchair skills in the capacity of a caregiver assisting a manual wheelchair user.
2. Assess caregivers' capacity to assist manual wheelchair users in performing a set of 23 wheelchair skills.
3. Identify motor-skills-learning principles and training tips that may be useful for training caregivers to perform a set of 23 wheelchair skills.

Abstract

Many manual wheelchair users require the assistance of caregivers to effectively and safely manage obstacles in their everyday lives. Unfortunately, there can be negative health impacts on caregivers. Although research evidence is beginning to accumulate on the caregiver role in general, the assessment and training of caregivers to assist in the performance of wheelchair skills have received little attention. The Wheelchair Skills Program (WSP) (www.wheelchairskillsprogram.ca) provides such protocols. This workshop will provide participants with an opportunity to observe and discuss a set of 23 caregiver skills including preferred techniques, assessment methods and training principles.

Content references:

1) Kirby RL, Rushton PW, Smith C, Routhier F, Axelson PW, Best KL, Betz K, Burrola-Mendez Y, Contepomi S, Cowan R, Giesbrecht E, Kenyon LK, Koontz A, MacKenzie D, Mortenson B, Parker K, Smith E, Sonenblum S, Tawashy A, Toro M, Worobey, L. Wheelchair Skills Program Manual Version 5.1 (2020). Published electronically at Dalhousie University, Halifax, Nova Scotia, Canada. www.wheelchairskillsprogram.ca/eng/manual.php.
2) Kirby RL, Rushton PW, Routhier F, Demers L, Titus L, Miller-Polgar J, Smith C, McAllister M, Theriault C, Matheson K, Parker K, Sawatzky B, Labbé D, Miller WC. Extent to which caregivers enhance the wheelchair skills capacity and confidence of power wheelchair users: a cross-sectional study. Arch Phys Med Rehabil. 2018;99:1295-302.
3) Keeler L, Kirby RL, Parker K, McLean KD, Hayden J. Effectiveness of the Wheelchair Skills Training Program: a systematic review and meta-analysis. Disabil Rehabil Assist Technol 2019;14:391-409.

Presenter biography

R. Lee Kirby received his MD degree from Dalhousie University in Halifax, Nova Scotia, Canada. His specialty training in Physical Medicine and Rehabilitation was carried out at the University of Washington in Seattle, Washington, USA, at Dalhousie University and at Stoke Mandeville Hospital in England. He is a Professor in the Division of Physical Medicine and Rehabilitation in the Department of Medicine at Dalhousie University in Halifax, Nova Scotia, Canada with a cross-appointment in Community Health and Epidemiology. His primary research interest is the safety and performance of wheelchairs. He has held research grants from a number of national and international funding bodies. He has authored or co-

authored 2 books and 168 papers in peer-reviewed journals. He heads the team that developed the Wheelchair Skills Program, a low-tech, high-impact training program that is relevant for both more- and less-resourced settings.

Cher Smith did her Occupational Therapy training at the University of Toronto and received her MSc Degree in Kinesiology from Dalhousie University. She is a member of the Dalhousie University Wheelchair Research Team and acts as the Seating and Mobility Coordinator at Nova Scotia Health in Halifax, Nova Scotia, Canada. She is also an Adjunct Professor in the School of Occupational Therapy at Dalhousie University. She has been working as an OT in research, clinical and educational work for 25 years. In 2002, Cher was awarded the Mundy Award by the Canadian Adaptive Seating and Mobility Association. She has presented widely to national and international audiences.

D1: The intricacies of posture, vision and mobility: The developmental trajectory of self-initiated mobility

Dr. Teresa Plummer
Belmont University, Nashville, USA
Associate Professor

Learning objectives

1. Describe the visual structures and functions of typical infants/children.
2. Understand the relationship between visual, postural and mobility milestones and how this impacts self-initiated mobility.
3. Discuss ways in which postural and mobility interventions can be utilized to improve visual functions for children with mobility impairments.
4. Describe the importance of self-initiated mobility for infants 6-36 months.

Abstract

This instructional session will present an overview of typical infant development. A comparison will be made between typical and atypical development for infants with developmental and mobility delays. A review of the neurological structures and functional skills related to posture, mobility and vision will be discussed and linked to the need for multi-modal interventions for mobility. Because the first 6 months of life are the most sensitive and the first 6 years the most significant for developmental of the visual system, this instructional course will highlight the need for mobility interventions for infants and discuss how this specifically relates to visual development. Further, this course will stress the importance of an inter-disciplinary collaboration of therapists and caregivers to develop effective strategies that can provide for integration of "therapy" that supports visual and motor development into everyday life activities. We will discuss positioning, handling, environmental, and mobility modifications to enhance the progress and participation of infants with developmental delays.

The intricate link between all sensorimotor systems will be explored to demonstrate how visual development relates to postural control and how postural control relates to mobility.

An understanding of these topics will aid participants in understanding the need for self-initiated mobility for infants and recommending appropriate mobility interventions at an early age

Content references:

1) Campos, J., Anderson, D., Barbu-Roth, M., Hubbard, E., Hertenstein, M., & Witherington, D. (2000). Travel broadens the mind. *Infancy, 1(2),* 149-219.
2) Feldner, H. (2019). Impacts of early powered mobility provision on disability identity: A case study. *Rehabilitation psychology*, *64*(2), 130.
3) Feldner, H. A., Logan, S. W., & Galloway, J. C. (2019). Mobility in pictures: A participatory photovoice narrative study exploring powered mobility provision for children and families. *Disability and Rehabilitation: Assistive Technology*, *14*(3), 301-311
4) Feldner, H. A., Logan, S. W., & Galloway, J. C. (2016). Why the time is right for a radical paradigm shift in early powered mobility: the role of powered mobility technology devices, policy and stakeholders. *Disability and Rehabilitation: Assistive Technology, 11*(2), 89-112.
5) Focaroli, V., & Iverson, J. (2017). Children's Object Manipulation: A Tool for Knowing the External World and for Communicative Development. In *The Hand: Perception, Cognition, Action* (pp. 19–26). Springer.
6) Frank, M. C., Amso, D., & Johnson, S.P. (2013). Visual search and attention to faces during

early infancy. *Journal of Experimental Child Psychology,* 118, 13-26.
7) Gaven, S. (2004). Early neurosensory visual development of the fetus and newborn. *Clinics in Perinatology. 31,* 199-216
8) Henderson, A., & Pehoski, C. (2006). Hand Functions in the Child: Foundations for Remediation, 2nd ed. Mosby, Elsevier. St. Louis, MO.
9) Plummer, T., Logan, S. W., & Morress, C. (2020). Explorer Mini: Infants' Initial Experience with a Novel Pediatric Powered Mobility Device. *Physical & Occupational Therapy In Pediatrics*, 1-17.
10) Rosen, L., Plummer, T., Sabet, A., Lange, M.L., & Livingstone, R. (2017). RESNA position on the application of power mobility devices for pediatric users. *Assistive Technology, 12*, 1- 9. doi: 10.1080/10400435.2017.1415575
11) Scheiman, M. (2011). *Understanding and managing vision deficits: A guide for occupational therapists.* Thorofare, NJ: SLACK Inc.≥
12) Soska, K. C., & Adolph, K. E. (2014). Postural Position Constrains Multimodal Object Exploration in Infants. Infancy, 19(2), 138-161. doi:10.1111/infa.12039
13) Westcott, S., & Burtner, P. (2004). Postural control in children: Implications for pediatric practice. *PT and OT in Pediatrics, 24,* 5-55.
14) World Health Organization., (2014). *Visual impairment and blindness*. Retrieved from: http://www.who.int/mediacentre/factsheets/fs282/en/

Presenter biography

Dr. Teresa Plummer, PhD, OTR/L, ATP, CEAS, CAPS holds credentials as an Assistive Technology Professional (ATP), Certified Ergonomic Specialist (CEAS) and Certified Aging in Place Specialist (CAPS). Dr. Plummer has been a practicing occupational therapist since 1979 and has been an invited presenter to Dublin, Switzerland, Singapore, Buenos Aires and many state and national conferences. She has assisted in the development of wheelchair service practice guidelines for North America, Europe and Australia. She also works the International Society of Wheelchair Professionals, selected to serve on the Educators' Package Development to create sustainable evidence - based curriculum for OT/PT programs worldwide. Her areas of research center around participatory methods, qualitative research and users' perspectives of mobility devices. Her recent works has been with the Explorer Mini by Permobil A device cleared by FDA for infants 12-36 months. Her work now centers around creating practice guides and developing research protocols for clinical testing.

D2: Slipping and sliding: exploring the link between horizontal shear forces and sliding frequency.

Bart Van Der Heyden
Private Practise 'de kine', gent, Belgium

Learning objectives

1. Describe the impact of different wheelchair adjustments on sliding, seating tolerance, head position and upper extremity function
2. Describe the impact of different pelvis support systems on sliding frequency
3. Discuss at least 3 postural interventions for dealing with sliding challenges
4. Be able to advise and implement a postural intervention plan for users with common seating challenges for maintaining posture and long-term functional ability.

Abstract

Inappropriate wheelchair seating is common. Among long-term care residents, the prevalence rate of inappropriate seating was 58,6%, the implications of which are discomfort, poor positioning and mobility and skin integrity issues (1 and 2). Individually prescribed wheelchairs are recommended to ensure proper fit and enhance function (3,4).

But what is the effect of common seating interventions and wheelchair adjustments on sliding frequency and is there a link between the sliding tendency of wheelchair users and the total horizontal shear force?

Several wheelchair users with sliding tendencies will be examined and discussed. The initial sliding frequency and repositioning frequency will be recorded, and the total horizontal shear force will be measured using the Ishear measuring tool. Then a seating assessment will be preformed. Based on the wheelchair user's needs and the findings of the seating assessment, common seating interventions will be implemented:

- Back support adjustments (tilt and recline)
- Introduction of a 2 and 4 point pelvic positioning system
- Different mounting angles of 2 point positioning systems: 45 degree vs. 70 degree angle

These adjustments have an influence on the sliding frequency and total horizontal shear force. The findings of the cases will be analyzed and the impact of different postural control techniques will be discussed.

Content references:

1) Canada S. Participation and Activity Limitation Survey 2006. Ottawa: 2008
2) 2.Giesbrecht EM, Martenson, WB, Miller W. Prevalence and facility level correlates of need for wheelchair seating assessment among long term care residents. Gerontology. 2012; 58(40:378-384)
3) Mortenson WB, Miller WC. The wheelchair procurement process: perspectives of clients and prescribers. Can J Occp Therapy. 2008; 75: 167-75
4) Bourbonniere MC, Fawcett LM, Miller WC, Garden J, Mortenson WB. Prevalence and predictors of need for seating intervention and mobility for persons in long-term care. Can J Aging. 2007;26:195–204

Presenter biography

Bart Van Der Heyden has specialized in the field of seating, wound care and mobility for over 25 years. After studying physical therapy in Gent, Belgium, he gained experience in Germany providing seating and therapy for children with Cerebral Palsy. After working in a rehab setting in the USA he offered clinical consultations to wheelchair users, clinicians and manufacturers worldwide. He has also

started a physical therapy practice with his wife in Belgium.

Bart has developed multiple training courses and workshops on skin management, seating assessment, seating techniques & interventions for different user populations. He has presented for seating specialists all over the world and he developed a seating approach for clinical problem solving and maximizing outcomes.

Bart is known as a skilled and experienced clinician and presenter with a global, hands-on and multi-disciplinary view on clinical practice and seating.

More info: www.super-seating.com

D3: Segmental Assessment of Trunk Control (SATCo)

Mr Robert Norman, Ms Amy Bjornson
Sunrise Medical, Sydney, Australia
Mr Robert Norman, Product Specialist Clinical Hub
Ms Amy Bjornson, Clinical Director – Asia Pacific

Learning objectives

1. The participant will be able to describe how the SATCo can be used as an outcome tool for postural Control
2. The participant will be able to state at least one adjustment that facilitates segmental targeted training in the person's trunk posture.
3. The participant will be able name 2 approaches in integrating positioning equipment functionally into daily routines

Abstract

This seminar is focused on the application of a treatment approach called "Segmental Assessment of Trunk Control", (SATCo) in the Pediatric Population. Many of our treatment paradigms in therapy and the application of Assistive Technology are based on facilitating proximal stability for distal function. SATCo is an alternative treatment approach that is based on targeted training to gain control of trunk posture. Therapist's hands or therapy supports are placed on the child's trunk directly beneath the segment where control is found to be difficult in the child. This support is gradually lowered as control is gained. During the seminar, attendees will learn about SATCo and the underlying research that was led to its development, this will be discussed specific to the selection and set-up in standing frames and a therapy bench. Additionally the SATCo can also be used as an outcome tool for justifying the clinical effectiveness in sitting and standing therapy. Case examples will be used to demonstrate this approach.

Content references:

1) Butler PB, Saavedra S, Sofranac M, Jarvis SE, Woollacott MH. Refinement, Reliability, and Validity of the Segmental Assessment of Trunk Control. Pediatric Physical Therapy. 2010; 22(3):246-257. Winner of the Toby Long Award for the best manuscript published in Paediatric Physical Therapy, 2010.
2) Palisano RJ, Rosenbaum P, Walter S, et al. Development and reliability of a system to classify gross motor function in children with cerebral palsy. Dev Med Child Neurol. 1997; 39: 214–223. https://canchild.ca/en/resources/44-gross-motor-function-measure-gmfm
3) Haley SM, Coster WJ, Ludlow LH, Haltiwanger JT, Andrellos PA. Pediatric Evaluation of Disability Inventory: Development, Standardization and Administration Manual. Boston, MA: Trustees of Boston University, 1992. Haley S, Coster W. PEDI-CAT: Development, Standardization and Administration Manual. Boston, MA: CRECare, LLC, 2010.
4) Pountney TE, Cheek L, Green E, Mulcahy C, Nelham R. Content and Criterion Validation of the Chailey Levels of Ability. Physiotherapy. 1999; 85(8): 410-416.
5) Rodby-Bousquet E, Persson-Bunke M, Czuba T. Psychometric evaluation of the Posture and Postural Ability Scale for children with cerebral palsy. Clinical Rehabil. 2016; 30(7): 1-8. Rodby-Bousquet E, Agustsson A, Jonsdottir G, Czuba T, Johansson AC and Hagglund G. Interrater reliability and construct validity of the Posture and Postural Ability Scale in adults with cerebral palsy in supine, prone, sitting and standing positions. Clin Rehabil 2014; 28: 82–90. (Note: This paper gives the PPAS in full.)

Presenter biography

Robert Norman is a seating and mobility product specialist in Australia and is currently working in the Sunrise Medical Clinical Hub. Robert has 17 years of experience in seating and mobility industry in the UK as well as Australia for the last 5 years. His past experience is as a Technical Trainer at JCM seating in the UK, Paediatric Product Specialist for Hewerdines in the UK, working with a children's charity. Robert has also worked for equipment suppliers in Australia as a senior AT Consultant. Robert has presented nationally in Australia on various seating and mobility topics.

Amy Bjornson trained as a Physical Therapist in the United States, Amy has over 20 years' experience working with adult and pediatric neurologic populations, with specialties in the treatment of spinal cord injury, and provision of assistive technology for clients with physical challenges.

Based in Sydney, Amy currently develops and implements national and international training programs on using Assistive Technology to enhance inclusion, health and well-being in those with physical disabilities. She also serves a product improvement and development role for Sunrise Medical, Australia.

Amy is a dynamic speaker who has lectured extensively on seating and mobility. She has also traveled to several developing countries, learning and sharing information with their medical communities.

Amy received her ATP certification in 1995, SMS certification in 2015 and Australian Physiotherapy certification in 2018. She is an active member of Wheelchairs for Humanity, Health Volunteers Overseas and offers technology support to Hidden Treasures Home, Fuzhou China.

E1: Choosing the Right Mobility Device for Infants and Children

Dr Ginny Paleg
Montgomery County Infants and Toddlers Program, Rockville, USA

Learning objectives

1. Understand how to identify which infants can benefit from early mobility

2. Evidence for power mobility

3. Who can self propel

4. Evidence for upright supported stepping devices

Abstract

The General Movement Assessment and Hammersmith Infant Neurological Exam score allows us to identify which infant will most likely have lifelong sensory and motor impairments at 2-5 months of age. Using the Gross Motor Function Classification System (GMFCS) level, physical therapists can predict very early which child will most likely benefit from early augmented mobility interventions. In this session, speakers will present our research on power mobility, who can self propel and gait trainers, support walkers and a dynamic mobility system.

Content references:

1) Altizer W, Noritz G, Paleg G. Use of a dynamic gait trainer for a child with thoracic level spinal cord injury. BMJ Case Rep. 2017 Oct 10;2017.
2) Rodby-Bousquet E, Paleg G, Casey J, Wizert A, Livingstone R. Physical risk factors influencing wheeled mobility in children with cerebral palsy: a cross-sectional study. BMC Pediatr. 2016 Oct 10;16(1):165.
3) Livingstone R and Paleg G. Measuring Outcomes for Children with Cerebral Palsy Who Use Gait Trainers. Technologies 2016, 4(3), 22.
4) Paleg, G and Livingstone R. Evidence-Informed Clinical Perspectives on Selection of Gait Trainer Features for Children with Cerebral Palsy. International Journal of Therapy and Rehabilitation. 2016 23 (9) .
5) Paleg G, Huang M, Vasquez Gabela SC, Sprigle S, Livingstone R. Comparison of the Inertial Properties and Forces Required to Initiate Movement for Three Gait Trainers. Assist Technol. 2016 Fall;28(3):137-43
6) Paleg G and Livingstone R. Outcomes of gait trainer use in home and school settings for children with motor impairments: A systematic review. Clin Rehabil. 2015 Jan 30.
7) Livingstone, R and Paleg, G. Practice considerations for the introduction and use of power mobility for children. Dev Med Child Neurol. 2013 Sep 3.
8) Casey J, Paleg, G, and Livingstone, R. (2013) Facilitating child participation through power mobility. British Journal of Occupational Therapy, 76 (3). pp. 157-159.

Presenter biography

Ginny Paleg is a pediatric physiotherapist from Silver Spring, Maryland, USA. For the past 17 years, she has worked with children aged 0-3 years in homes and childcare. Ginny earned her master's degree in physical therapy at Emory University and her DScPT at the University of Maryland Baltimore. Ginny specializes in posture and mobility assessment and interventions for children at GMFCS Levels IV and V. She is certified in Prechtl General Movement Assessment (GMA) and the Hammersmith Infant Neurological Exam (HINE) and trained in Routines Based Interventions (McMaster) and coaching (Sheldon and Rush). She has published over 15 peer-reviewed journal articles on standing, gait trainers, and power mobility. She is the

lead author for the American Academy of Cerebral Palsy Hypotonia Care Pathway. She is the Incoming Chair of the AACPDM Communications Committee (2021-2023). Her latest publications are a case study on a child with “treated type 1 SMA” and a study on weight bearing in various positions in 3 models of standers.

E2: Applying Disability Studies and Critical Disability Theory to Mobility Technology Research: Tensions Explored, Lessons Learned

Dr. Heather Feldner
University of Washington, Seattle, USA
Assistant Professor

Learning objectives

After attending this session, participants will be able to:

1. Discuss two differences between the medical, social, and political-relational models of disability.
2. Identify three ways in which a medical model of disability underpins pediatric mobility technology provision, despite adoption of more contemporary philosophical beliefs about mobility, disability, and assistive technology.
3. Describe at least two methods and outcomes of a mobility technology research program infused with Disability Studies principles.
4. Evaluate one way that Disability Studies and Critical Disability Theory may be applied to the development of a mobility technology research program or influence clinical practice in the participant's practice setting.

Abstract

Mobility is essential for all children to access their world and achieve self-directed participation in family and community life. However, a complex landscape exists for clinicians and caregivers supporting this goal, especially for young children who may benefit from early mobility technology (MT) intervention. Despite adoption of more contemporary philosophical beliefs about mobility, disability, and technology, challenges to implementation remain, including a focus on walking as an implicitly preferred mode of mobility, shortcomings in the availability and design of pediatric technology, negative perceptions of wheelchairs as a signifier of disability, and accessibility barriers. These issues reflect a medical model view of disability and expose the tension between this traditional rehabilitation approach and a disability studies perspective, which interrogates the able-bodied ideal, situates disability as a social construct, and considers technology use in a more relational context.

This presentation describes how the field of Disability Studies and a political-relational theory of disability underpinned the development and implementation of a novel MT research program at the University of Washington in Seattle, WA, USA. Results from several studies conducted as a part of this research program will be shared, including quantitative device use patterns; qualitative caregiver perspectives of disability and responses to their child's disability/identity, their emerging role as advocates, and their changing views of MT across time; and participatory photo journals that provide visually compelling narratives about technology and community engagement. This presentation will highlight new research evidence that may better prepare clinicians and assistive technology professionals to engage with families around the complex topics of disability and MT as a part of multimodal mobility intervention, as well as to advocate for policy and accessibility change outside the clinic. It will also highlight how critical disability theory can serve as a powerful tool for interrogating both the role of, and reaction to, the introduction of MT in the early stages of family life with a child with a disability.

Content references:

1) Feldner, H. A., Logan, S. W., & Galloway, J. C. (2019). Mobility in pictures: a participatory photovoice narrative study exploring powered mobility provision for children and

families. *Disability and Rehabilitation: Assistive Technology*, *14*(3), 301-311.
2) Feldner, H. (2019). Impacts of early powered mobility provision on disability identity: A case study. *Rehabilitation Psychology*, *64*(2), 130.
3) Feldner, H. A., Logan, S. W., & Galloway, J. C. (2016). Why the time is right for a radical paradigm shift in early powered mobility: the role of powered mobility technology devices, policy and stakeholders. *Disability and Rehabilitation: Assistive Technology, 11*(2), 89-112.
4) Gibson, B. (2016). *Rehabilitation: a post-critical approach*. CRC Press.
5) Gibson, B. E., & Teachman, G. (2012). Critical approaches in physical therapy research: Investigating the symbolic value of walking. *Physiotherapy Theory and Practice*, *28*(6), 474-484.
6) Kafer, A. (2013). *Feminist, queer, crip*. Indiana University Press.
7) Logan, S. W., Bogart, K. R., Ross, S. M., & Woekel, E. (2018). Mobility is a fundamental human right: Factors predicting attitudes toward self-directed mobility. *Disability and health journal*, *11*(4), 562-567.
8) Logan, S. W., Hospodar, C. M., Bogart, K. R., Catena, M. A., Feldner, H. A., Fitzgerald, J., ... & Smart, W. D. (2019). Real World Tracking of Modified Ride-On Car Usage in Young Children With Disabilities. *Journal of Motor Learning and Development*, *1*(aop), 1-18.
9) Pituch E, Rushton PW, Ngo M, Heales J, Poulin Arguin A. Powerful or Powerless? Children's, Parents', and Occupational Therapists' Perceptions of Powered Mobility. Physical & occupational therapy in pediatrics. 2019 May 4;39(3):276-91.

Presenter biography

Dr. Heather Feldner is an Assistant Professor in the Department of Rehabilitation Medicine, core faculty in the Disability Studies Program, and an Associate Director of the Center for Research and Education on Accessible Technology and Experiences (CREATE) at the University of Washington in sunny Seattle, WA, USA. Her research is centered at the intersection of mobility, disability, and technology in two primary areas: Perceptions of disability and identity and how these emerge and evolve through technology use in children and adults with disabilities; and in the design and implementation of pediatric mobility technology, considering how attitudes and the built environment affect equity, participation, and device use. Her current work incorporates multidisciplinary, mixed methods, and participatory approaches drawing from her background as a pediatric physical therapist, doctoral work in disability studies, and postdoctoral research in user-centered rehabilitation and design in mechanical engineering.

P1: Whiria te tangata with Dynamic Seating - A case Study

Ms Victoria Cotton
Northland DHB, Whangarei, New Zealand
Physiotherapist/Wheelchair Therapist

Learning objectives

1. Name 3 Seating Dynamic Accessories that may increase tolerance in sitting

2. Describe 2 modifications to allow change of force in dynamic seating

3. Identify 3 different seating components to assist with positioning

Abstract

This is a case study poster presentation of a young man(age 21) using complex seating and wheelchair with Dynamic components to assist with management of tone and movements. The client has had numerous complex surgeries and many wheelchair and seating interventions over the years. I have been his therapist for approx. 20 years.

He is very keen to share the latest model with you as many others may benefit from his journey .

We ,the client, whanau and members of Wheelchair Services, have grown together overcoming many challenges not to mention our ages, technology and life experiences The case study has a WhOM outcome measure.

Content references

1) Resna - Position Statements on Dynamic Seating
2) Let's get moving ! Providing movement within a wheelchair . Michelle L Lange. e ParentConnect ,Featured Topics, Mobility05/25/2018 admin.
3) Seating Dynamics -Revolutionizing the Dynamic Footrest Marc Hagen .Closing the Gap March 17,2021

Presenter biography

Victoria Cotton is a physiotherapist originally from UK -qualified in UK. She worked for many years in the Middle East and New Zealand as Wheelchair and Seating therapist in Northland for Te Poari Hauora a Rohe o Te Tai Tokerau (NorthlandDHB)

We travel around Te Tai Tokerau supporting clients and Whanau which has many Health and Service inequalities.

P2: "He Took Off...Fast!": A Photo Narrative of Modified Ride-On Car Use by Children and Families

Ms. Reham Abuatiq, Dr. Heather Feldner
University of Washington, Seattle, USA
Reham Abatiq, PhD Student
Dr Heather Feldner, Assistant Professor

Learning objectives

After this poster session, participants will be able to:

1. Identify the role of photovoice narratives as a participatory action research method applied to the field of pediatric positioning and mobility.
2. Understand at least three perceived facilitators and barriers of modified ride-on car access and use by children with CP or developmental delay and their families.
3. Discuss how the visual impact and narration of child and family technology experiences can be leveraged to improve products and processes related to mobility equipment.

Abstract

Powered mobility devices (PMDs) can increase independent mobility and enhance function and participation in children with disabilities. Over the past decade, modified ride-on cars have emerged as one alternative early powered mobility option for young children with disabilities such as cerebral palsy (CP) or developmental delay.

Although popularity of modified ride-on cars has been growing, little is known from families' own point of view about their perceived mobility priorities and experiences with the cars over a longitudinal period. We aimed to empower families of children with CP or developmental delay to share their mobility stories and experiences with modified ride-on cars using their own words and pictures, via a participatory research technique known as Photovoice Narrative. During an overarching longitudinal study with 19 families, where children between the ages of one and four years old and their caregivers were provided with a custom modified ride-on car for home and community exploration, mobility, and socialization, a subset of 14 families completed this participatory study as co-researchers. Each caregiver was given a digital research camera with a blank memory card and a list of guiding questions, but had the freedom to take photos of anything they felt was meaningful or important related to their child's modified ride-on car use. Participants then selected their favorite or most meaningful photos, and provided brief narrations. Narrations which were transcribed verbatim and grouped into themes alongside the photos using constant comparison. Three preliminary themes emerged from the data: 1) *My Child CAN…*2) *Mobility Begets Agency and Community Building*; and 3) *Technology Challenges and Barriers Remain.* This study demonstrates that Photovoice Narratives are an accessible and visually compelling way to understand how modified ride-on cars may fit or misfit in the lives of children with disabilities and their families.

Content references

1) Burke, J. (2012). 'Some kids climb up; some kids climb down': culturally constructed play-worlds of children with impairments. *Disability & Society*, *27*(7), 965-981.
2) Carver, J., Ganus, A., Ivey, J. M., Plummer, T., & Eubank, A. (2016). The impact of mobility assistive technology devices on participation for individuals with disabilities. *Disability and Rehabilitation: Assistive Technology*, *11*(6), 468-477.
3) Chiarello, L. A., Palisano, R. J., Maggs, J. M., Orlin, M. N., Almasri, N., Kang, L. J., & Chang, H. J. (2010). Family priorities for activity and participation of children and youth with cerebral

palsy. *Physical therapy*, *90*(9), 1254-1264.
4) Dockett, S., Einarsdottir, J., & Perry, B. (2017). Photo elicitation: Reflecting on multiple sites of meaning. *International Journal of Early Years Education*, *25*(3), 225-240.
5) Feldner, H. A., Logan, S. W., & Galloway, J. C. (2019). Mobility in pictures: a participatory photovoice narrative study exploring powered mobility provision for children and families. *Disability and Rehabilitation: Assistive Technology*, *14*(3), 301-311.
6) Palisano, R. J., Shimmell, L. J., Stewart, D., Lawless, J. J., Rosenbaum, P. L., & Russell, D. J. (2009). Mobility experiences of adolescents with cerebral palsy. *Physical & occupational therapy in pediatrics*, *29*(2), 133-153.
7) Sutton-Brown, C. A. (2014). Photovoice: A methodological guide. *Photography and Culture*, *7*(2), 169-185.
8) Rodger, S., Jackson, D., Vines, J., McLaughlin, J., & Wright, P. (2019, May). JourneyCam: Exploring experiences of accessibility and mobility among powered wheelchair users through video and data. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. 1-15).
9) Taherian, S., & Davies, C. (2018). Multiple stakeholder perceptions of assistive technology for individuals with cerebral palsy in New Zealand. *Disability and Rehabilitation: Assistive Technology*, *13*(7), 648-657.

Presenter biography

Ms. Reham Abuatiq is a pediatric physical therapist and second-year PhD student in the Rehabilitation Sciences Program at the University of Washington in Seattle, WA, USA. Originally from Amman, Jordan, Reham holds a Bachelor's Degree in Physical Therapy and a Master's in Health Services Management from Yarmouk University and the Royal College of Surgeons in Ireland. She has extensive experience in training physical therapy students in public hospitals, outpatient rehabilitation clinics, and special education schools, and worked as a clinician at Al-Hussein Society for Physically Disabled Children with children with cerebral palsy, spina bifida, Duchenne Muscular Dystrophy, and Down syndrome. Her research interests include advancing access to physical therapy services for children in Jordan, improving equity for children with disabilities in school and community settings, and supporting the transition from adolescence to adulthood in young people with cerebral palsy.

Dr. Heather Feldner is an Assistant Professor in the Department of Rehabilitation Medicine, core faculty in the Disability Studies Program, and an Associate Director of the Center for Research and Education on Accessible Technology and Experiences (CREATE) at the University of Washington in sunny Seattle, WA, USA. Her research is centered at the intersection of mobility, disability, and technology in two primary areas: Perceptions of disability and identity and how these emerge and evolve through technology use in children and adults with disabilities; and in the design and implementation of pediatric mobility technology, considering how attitudes and the built environment affect equity, participation, and device use. Her current work incorporates multidisciplinary, mixed methods, and participatory approaches drawing from her background as a pediatric physical therapist, doctoral work in disability studies, and postdoctoral research in user-centered rehabilitation and design in mechanical engineering.

P3: Trends in complex wheelchair and seating equipment provision in Tāmaki Makaurau, Aotearoa

Maria Whitcombe-Shingler
ADHB, Auckland, New Zealand, Educator

Learning objectives

1. To consider the trends in complex wheelchair and seating provision over the last decade.
2. Increase awareness of a holistic approach to wheelchair and seating assessment and equipment provision that considers the social, environmental and lifestyle needs of the individual alongside their clinical requirements, using the principle of Whanaungatanga, connecting.
3. Consider use of clinical data as the basis for improving outcomes and use of resources.

Abstract

Auditable data is increasingly available and accessible from digitised clinical records, to inform clinicians of overall practice trends in complex wheelchair and seating equipment provision, as opposed to anecdotal evidence. It gives useful feedback on client demographics and equipment used that can help inform equity and effectiveness. *'He mauri tō te tangata, he whakapapa tōna, he mana motuhake'* Everyone has mana and identity that makes that person no more and no less important than the next person.

Mobility Solutions is based in Tāmaki Makaurau, Auckland, a large metropolitan city in the North Island of Aotearoa, New Zealand. It is the most populous urban area in the country, and has an urban and rural population of about 1,717,500 (June 2020). Data is analysed to demonstrate practice changes and outcomes within the service in the last decade, and the importance of enabling and increasing social connection through effective mobility and positioning.

'*Me hui kanohi ki te kanohi kia rongo i te mauri o te tangata!'* It is important to meet face to face, eye to eye, breath to breath to get a full understanding of the people we are working with.

Content references

1) Bray et al. (2014). Wheelchair interventions, services and provision for disabled children: a mixed-method systematic review and conceptual framework. BMC Health Services Research, 14:309 Retrieved from http://www.biomedcentral.com/1472-6963/14/309Health Research Council of New Zealand. (2019). Maori Health Advancement Guidelines. Retrieved from **https://www.hrc.govt.nz/sites/default/files/2021-02/HRC%20Maori%20Health%20Advancement%20Guidelines.pdf**MOH. (2002). Toward Clinical Excellence. An introduction to clinical audit, peer review and other clinical practice improvement activities. Retrieved from https://www.health.govt.nz/system/files/documents/publications/moh_tce_2002.pdfMOH. Equipment and modifications for disabled people. Retrieved from
2) https://www.health.govt.nz/your-health/services-and-support/disability-services/types-disability-support/equipment-and-modifications-disabled-people
3) Paki, T. (2015). Whanaungatanga. Retrieved from http://blog.core-ed.org/blog/2015/07/whanaungatanga.html
4) Statistics New Zealand. (2020). Population estimates and projections. Retrieved from https://www.stats.govt.nz/topics/population-estimates-and-projections?gclid=EAIaIQobChMIh5r9qsvv7wIVUx0rCh1GMw-KEAAYASAAEgIRevD_BwE

Presenter biography

Maria Whitcombe-Shingler is an occupational therapist, who works at the Mobility Solutions Complex Wheelchair and Seating Service in the Auckland Region. Her main role is currently as an educator and mentor for therapists new to the service. She completed her Masters researching adult users' experiences and perspectives of using multifunction power wheelchairs in Aotearoa, New Zealand.

P4: “We can do it together” Co-adaptation of the Wheelchair Skills Training Program for children

Beatrice Ouellet[1,2], Dr Paula Rushton[3,4], Dr Marie-Eve Lamontagne[1,2], Dr Krista Best[2]
[1]Laval University, Quebec, Canada. [2]Centre for Interdisciplinary Research in Rehabilitation and Social Integration, Quebec, Canada. [3]Montreal University, Montreal, Canada. [4]CHU Ste-Justine Research Center, Montreal, Canada
Beatrice Ouellet, Occupational therapist and PhD student
Dr Paula Rushton, Associate professor
Dr Marie-Eve Lamontagne, Associate professor
Dr Krista Best, Assistant professor

Learning objectives

After attending the presentation, participants will be able to:

1. Identify 3 obstacles limiting the provision of pediatric wheelchair training services.
2. Identify 5 children and parents’ needs regarding wheelchair training.
3. Describe 6 essential components that a wheelchair training intervention should include to respond the needs of children and their family.

Abstract

Introduction. Independent wheelchair mobility represents more than moving through spaces for children with physical disabilities. It facilitates exploration and interaction with the environment, thus fostering global development and social participation. However, wheelchair use is a complex activity that requires training for safe and effective mobility. An evidence-based Wheelchair Skills Training Program (WSTP) has been used effectively by rehabilitation clinicians to train adults, but there are limited pediatric-specific guidelines. Preliminary evaluations of the WSTP with children suggested that modifications are needed to increase adherence and effectiveness. The aim of this study is to co-adapt the WSTP for children ages 5 to 12 years (WSTP-Ped). **Method.** Using nominal group techniques, nine online meetings were conducted with an international committee of experts in wheelchair training. Consensus for modifications to the WSTP for children was obtained. Interviews with 5 parent-child dyads were conducted to identify families’ needs and preferences for wheelchair training. **Preliminary results.** Pediatric training should focus on occupational goals and structured play-based approaches. Parents should be active partners of the training team. A developmental progression of wheelchair skills acquisition can help rehabilitation clinicians define a suitable customized practice schedule depending on age, expected level of independence, and goals. Certain skills of the WSTP should be adapted to pediatric wheelchair components and physical characteristics of younger children (e.g. picks objects from floor). Tips and tricks for teaching wheelchair skills to children should be added to the WSTP manual. **Conclusion.** This project will result in integration of pediatric considerations in the WSTP manual, and creation of a pediatric specific manual, derived in partnership with its intended users (ie., children, clinicians and parents). The WSTP manual will be available to pediatric rehabilitation clinicians as an easy-to-use resource for wheelchair mobility training. The next step is to conduct a randomized control trial to evaluate effectiveness.

Content references

1) Keeler, L., Kirby, R. L., Parker, K., McLean, K. D., & Hayden, J. A. (2019). Effectiveness of the wheelchair skills training program: A systematic review and meta-analysis. *Disability and Rehabilitation: Assistive Technology*, *14*(4), 391–409. https://doi.org/10.1080/17483107.2018.1456566

2) McMillan, S. S., King, M., & Tully, M. P. (2016). How to use the nominal group and delphi techniques. *International Journal of Clinical Pharmacy*, *(20160205)*. https://doi.org/10.1007/s11096-016-0257-x
3) Sawatzky, B., Rushton, P. W., Denison, I., & McDonald, R. (2012). Wheelchair skills training programme for children: A pilot study. *Australian Occupational Therapy Journal*, *59*(1), 2–9. https://doi.org/10.1111/j.1440-1630.2011.00964.x

Presenter biography

Beatrice Ouellet is an occupational therapist with experience working in pediatrics. She completed a master's degree in public health and is now a doctoral student in clinical and biomedical sciences (option rehabilitation) at Laval University (Quebec, Quebec, Canada). Her project aims to co-develop and evaluate a wheelchair training program for children that is based on the Wheelchair Skills Program. She is a member of the Wheelchair Skills Program pediatric sub-committee. She is supervised by Krista Best, PhD and Marie-Eve Lamontagne, OT PhD.

P5: Wheelchair Skill Development for a Therapy Team

Miss Amy Hughes
ADHB, Auckland, New Zealand
Miss Amy Hughes, Kaiwhakaora Ngangahau
Ms Ulrike Luebcke, Kaiwhakaora Ngangahau
Miss Brylee Lyons, Kaiwhakaora Ngangahau
Mrs Michelle Smith, PT
Mrs Meg Whitelaw, Kaiwhakaora Ngangahau

Learning objectives

Following this poster session, participants will:

1. Learn about the journey of wheelchair skill development amongst a team of therapists measured by a pre and post survey.
2. View the resources developed to facilitate provision of wheelchair setup and skills training.

Abstract

From identifying learning needs to skill competency, the journey of service improvement can take time. This poster demonstrates our Ready to Roll wheelchair skill development for therapists within the Mobility Solutions service.

As clinicians working with complex clients, we recognised the need to up skill our team to achieve more effective wheelchair training outcomes. Our goal was to ensure that there is consistency in our practice through having standardised processes and skill level within our team.

Utilising the initial training and experience from Debbie Wilson and the Seating to Go service and drawing on the Wheelchair Skills Programme (Kirby et el.2018) we embarked on a service improvement journey. We completed a pre wheelchair skills training confidence survey across the team which identified the need for skill development, standard practice procedures and equipment to facilitate safe and effective training.

Understanding our client population and improving on client outcomes has guided us in this project.

We then completed a post wheelchair skills training confidence survey across the team with excellent results and helpful feedback for ongoing training. Through measuring baseline confidence and setting specific goals we have been able to increase the awareness, skill and confidence level of the therapy team. These outcomes are expected to support clients to become more effective wheelchair users.

This poster aims to share the resources developed throughout this mahi work which could be of benefit to other service providers thereby weaving people together, whiria te tangata.

Content references

1) Best, K.l., Routhier, F., & Miller, W.C. (2014). A description of manual wheelchair skills training: current practices in Canadian rehabilitation centres. Retrieved from https://doi.org/10.3109/17483107.2014.907367
2) Keller, L. et al. (2018). Effectiveness of the Wheelchair Skills Training Program: a systematic review and meta-analysis. Retrieved from https://doi.org/10.1080/17483107.2018.1456566
3) Kirby RL, et al. (2019). Wheelchair Skills Program Manual Version 5.1 Dalhousie University, Halifax, Nova Scotia, Canada. Retrieved from https://wheelchairskillsprogram.ca/wp-content/uploads/WSP-Manual-version-5.0-approved-version.3.pdf
4) Kirby RL, et al. (2019). Effectiveness of a Wheelchair Skills Training Program for Powered Wheelchair Users: A Randomized Controlled Trial. Retrieved from

https://doi.org/10.1016/j.apmr.2015.07.009
5) Tu, J. et al. (2017). Effectiveness and safety of wheelchair skills training program in improving the wheelchair skills capacity: a systematic review. Retrieved from **https://doi.org/10.1177/0269215517712043**

Presenter biography

Maria Whitcombe-Shingler is an occupational therapist, who works at the Mobility Solutions Complex Wheelchair and Seating Service in the Auckland Region. Her main role is currently as an educator and mentor for therapists new to the service. She completed her Masters researching adult users' experiences and perspectives of using multifunction power wheelchairs in Aotearoa, New Zealand.

Amy Hughes completed her undergraduate Occupational Therapy degree at the Auckland University of Technology in 2008. Amy has worked in numerous practice areas including Palliative care, Spinal Rehabilitation and Community Occupational Therapy in New Zealand and Australia. Amy has a passion for wheelchair and seating and has spent the majority of her career working within this specialist area with both the Mobility Solutions and Seating To Go wheelchair and seating assessment teams.

P6: Monitoring Wheelchair Tyre Pressure as part of wheelchair user education

Mr Bill Contoyannie[1,2], Ms Angela Rowe[1,2], Ms Kim Vien[1]
[1]Melbourne Health, Melbourne, Australia.
[2]Monash Health, Melbourne, Australia
Mr Bill Contoyannie, Rehabilitation Engineer
Ms Angela Rowe, Physiotherapist
Ms Kim Vien, Occupational Therapist

Learning objectives

1. To understand the importance of maintaining tire pressure and its impact on wheelchair use
2. To evaluate the effectiveness of tyre pressure education for young adults.
3. To learn strategies around supporting someone with their wheelchair maintenance

Abstract

Young adult wheelchair users seen by the specialised wheelchair and seating clinics at both Monash and Melbourne health have goals relating to optimising the use and performance of their wheelchairs by reducing the effort to push or propel the wheelchair. Research has established that performance efficiency in wheelchair use is directly related to wheelchair tyre pressures more than the wheelchair mass (De Groot S, Vegter RJ, Van der Woude LH - 2013).

The wheelchair tyre pressure was recorded for every client when attending the clinics with a view to establishing both the level that wheelchair tyres are maintained to, as well as part of an introduction for the clients to the performance of their wheelchairs.

Data collected over a number of years indicated that there were discrepancies between left and right wheelchair tyres as well as lower tyre pressure compared to the relevant ideal pressure to which the wheelchair tyres should have been set. During clinic visits the tyre pressures were set correctly and education was delivered to the client to optimise the performance and use of their wheelchair. In subsequent clinic visits, tyre pressure measures demonstrated similar lower tyre pressures indicating little to no change in behaviors to maintain optimum tyre pressures. The data is analysed and presented to show the general setting of tyre pressure of the wheelchairs at these clinics including the same client/wheelchair on return visits.

As clinicians, we need to consider the barriers to maintaining optimum tyre pressure including poor access to a tyre compressor, need for physical or cognitive support, and lack of education on the importance of maintaining optimum tyre pressure. Further research would be beneficial to understand these barriers and establish more effective strategies to maintain tyre pressure and optimising the use and performance of wheelchairs

Content references

1) Sawatzky BJ, Denison I. *Wheeling efficiency: the effects of varying tyre pressure with children and adolescents*. Pediatr Rehabil. 2006 Apr-Jun;9(2):122-6. doi: 10.1080/13638490500126707. PMID: 16449070.
2) De Groot S, Vegter RJ, Van der Woude LH. *Effect of wheelchair mass, tire type and tire pressure on physical strain and wheelchair propulsion technique*. Med Eng Phys. 2013 Oct;35(10):1476-82. doi: 10.1016/j.medengphy.2013.03.019. Epub 2013 May 2. PMID: 23642660.
3) Booka M, Yoneda I, Hashizume T, Lee H, Oku H, Fujisawa S. *Effect of Tire Pressure to Physical Workload at Operating a Manual Wheelchair*. Stud Health Technol Inform. 2015;217:929-34. PMID: 26294587

Presenter biography

Bill Contoyannis is a qualified rehabilitation Engineer with a degree in Mechanical engineering and a Masters of Biomedical Engineering and is an adviser to health departments, professional organisations, and support associations throughout Australia. He currently works within the speciaslied seating teams at Melbourne Health and Monash Health.

He has been involved in a broad range of rehabilitation and assistive technology areas and has contributed to the field area of assistive technology for over thirty years and with a range of activities including incident investigation, education, research, advice, and clinical support. As part of this work he conducted formal training courses worldwide in patient safety, failures of assistive technology devices and litigation avoidance, and material science relating to the fabrication of artificial limbs, orthopaedic devices, wheelchairs, and other assistive technology. Further, Bill has conducted research in both the development and assessment of assistive technology.

Angela Rowe is a physiotherapist with over 20 years of experience, predominantly in the fields of neurology and disability. She has completed post-graduate studies in the field of Postural Management and worked as a Postural Management therapist at The Royal Hospital for Neuro-disability in London. Since returning to Melbourne, Angela has worked in two Wheelchair and Seating Services at The Royal Melbourne Hospital and Monash Health. Angela has co-authored a Wheelchair organisational standard at Monash Health and been involved in various research projects and conference presentations with her Wheelchair and Seating clinic team. She has a particular passion for upskilling other therapists and has led training workshops and provided mentorship. Angela also has her own business Postural Innovations which provides bed positioning assessments, wheelchair consultations and a product range of postural supports for 24 hour positioning.

Kim Vien is a Senior Occupational Therapist working in the disability sector specialising in the area of seating and equipment prescription. Having been in the disability sector for over 10 years, Kim has presented on the topic of seating at the 2017 & 2019 Oceania Seating Symposiums and at multiple ATSA daily living expos. Kim graduated in 2005 from the University of South Australia and completed honors in health sciences. With further studies in access consulting, she has expanded her skills to understand the built environments and how consumers and their technologies can interact more effectively. She has worked in both hospital and community settings and is now focused on improving services for adults with disabilities and their assistive technology needs.

A3: Assessment of Learning Powered mobility use - approach and application

Lisbeth Nilsson
Associated to Lund University, Sweden
Occupational Therapists

Learning objectives

1. Discuss why it is important to apply the full ALP with instrument and facilitating strategies
2. Explain important aspects of how to apply the facilitating strategies
3. Apply the ALP approach to another activity involving tool use learning

Abstract

The learning approach Assessment of Learning Power mobility use (ALP) was developed for power mobility intervention with children and adults with multiple and complex disabilities involving mild to profound cognitive impairment. The ALP tool includes the ALP-instrument for assessment of the eight-phase learning process, and the ALP-facilitating strategies for guidance of approach for each phase and stage in the process. The instrument covers the full range of observational categories from novice to expert performance, thereby providing unique information necessary for assessing actual phase and stage of learning, also in early learners. The facilitating strategies informs selection of intervention approaches offering challenges matching the learners actual phase of tool use understanding. Using the full ALP is emphasized as a pre-requisite for best possible learning.

The ALP approach involves facilitator and learner in a reciprocal process of exploration, mutual interaction and learning. The facilitator explores the needs, characteristics and performance of the learner, as well as how to individually apply the ALP tool; and the learner explores how to interact with their physical and social environment in a new situation, as well as exploring what effects they get from active exploration of using a powered mobility tool. Video recordings will be used to illustrate one child's progress through the process of learning powered mobility use. Important aspects of the facilitating approach and possible outcomes of tool use learning in powered mobility are presented.

The identified learning process has gained recognition as being applicable with other assistive technologies. One example is the adaptation ALP for AAC (Alternative and Augmentative Communication) which will be shown. The generic ALP tool, version 3.0 is presented and exemplified by suggesting what performance is observed in the phases of learning for simple tools such as a spoon for self-feeding and complex tools such as applications for smart phones.

References:

1) Nilsson, L. Driving to Learn. The process of growing consciousness of tool use – a grounded theory of de-plateauing [dissertation]. [Lund, Sweden]: University of Lund; 2007. Available at: https://lup.lub.lu.se/search/publication/548098
2) Nilsson L. Powered mobility for people with profound cognitive disabilities leads to developing occupational performance. British Journal of Occupational Therapy. 2019;82(11)655–657.
3) Nilsson L., & Durkin J. Assessment of learning powered mobility use—Applying grounded theory to occupational performance. Journal of Rehabilitation Research and Development. 2014;51(6):963–74.
4) Nilsson L., & Durkin J. Powered mobility intervention: understanding the position of tool use learning as part of implementing the ALP tool. Disability and Rehabilitation: Assistive Technology. 2017;12(7):730-739.
5) Svensson, E. & Nilsson, L. Inter-rater reliability of the assessment of

learning powered mobility use, version 2.0, when applied with children and adults engaged in Driving to Learn in a powered wheelchair. Australian Occupational Therapy Journal. 2021; 68(2): 115-123.

Presenter Biography

Lisbeth Nilsson is a PhD and specialist in occupational therapy and associated researcher of Occupational Therapy and Occupational Science at Lund University, Sweden. She developed the intervention Driving to Learn™ in powered wheelchair for people with profound cognitive disabilities. Her special interests are tool use learning and assessment and facilitation of the learning process. She and her collaborator Durkin, PhD and OT, UK, developed the Assessment of Learning Powered mobility use (ALP).

Her current focus is implementation of the ALP tool in powered mobility intervention and other fields of assistive technology. She is actually collaborating and carrying out research nationally and internationally with OTs, PTs and SLPs; and she has presented and published her findings worldwide since 1998.

A4: Functional Movement Disorder – where do we fit in?

Rachel Maher
Permobil New Zealand, Auckland, New Zealand
Clinical Education Specialist

Learning objectives

Participants will

1. Be able to identify underlying mechanisms and aetiological factors associated with FMD
2. Identify three different presentations of FMD
3. Understand the basic treatment strategies behind FMD, including the role of the MDT

Abstract

This session will present an overview of Functional Movement Disorder, reviewing underlying mechanisms and aetiology, how it is diagnosed and potential treatment strategies, including the role of therapy.

Functional Movement Disorder (FMD) is a complex disorder with a wide range of signs of symptoms affecting a diverse range of individuals. Historically FMD was referred to as 'conversion' disorder, a diagnosis given when diagnostic tests failed to identify an organic cause for a person's symptoms, and with psychiatric / psychological intervention being the standard treatment. This approach has not always resulted in good outcomes, with a level of disability often persisting over time.

A person diagnosed with FMD can present with a significant level of disability, with resulting activity limitations and participation restrictions, hence will often be referred to therapy services for assistance and treatment. Establishing the optimal intervention for this person can be challenging, with the need to balance the potential for recovery in the long term with the need to maintain quality of life and participation in life activities in the short term.

Recent research has highlighted the role of a multi-disciplinary team approach to treatment of FMD, including both physiotherapy and psychological/psychiatric care. Treatment begins with how the diagnosis is communicated to the person, with a person's understanding and acceptance of the diagnosis impacting on their engagement with physiotherapy to help re-learn movement patterns and psychologist / psychiatrist input to address any underlying anxiety, depression or limiting behaviours where appropriate.

Content references:

1) Barbey, A. & Aybek, S. (2017). Functional Movement Disorders. Curr Opin Neurol, 30:427-434. DOI:10.1097/WCO.0000000000000464
2) Nielsen, G., Stone, J., Matthews, A., et al (2015). Physiotherapy for functional motor disorders: a consensus recommendation. Neuropsychiatry. 86: 1113-1119. dx.doi.org/10.1136/jnnp-2014-309255).
3) Nielsen, G., Buszewicz, M., Edwards, M.J. & Stevenson, F. (2020). A qualitative study of the experiences and perceptions of patients with functional motor disorder. Disability and Rehabilitation. Downloaded from Stevenson_Patient perceptions and experiences FMD_D&R_Revision Nov 11_clean.pdf (ucl.ac.uk)

Presenter biography

Rachel Maher graduated from the University of Otago in 2003 with a Batchelor of Physiotherapy, and later gained her Post Graduate Diploma in Physiotherapy (Neurorehabilitation) in 2010.

After graduating, Rachel gained experience in inpatient rehabilitation and community Physiotherapy, before moving into a Child Development Service, working with children aged 0 to 16 years.

Rachel developed a passion for seating and mobility while working children, recognising the value of a team approach to wheelchair and seating provision to achieve the best outcomes for end users.

Rachel later moved into a Wheelchair and Seating Outreach Advisor role at Enable New Zealand in 2014, complementing her clinical knowledge with experience in New Zealand Ministry of Health funding processes.

Rachel joined Permobil in June 2020, and is passionate about education and working collaboratively to achieve the best result for our end users

B3: Finding the best available evidence -fast: A brief refresher on finding & evaluating research for the busy clinician. (90 min LIVESTREAM INTERACTIVE SESSION)

Fi Graham

Participants will:

- Draft a clinical question that results in focused and accurate search results.
- Identify which (free) database best answers their search question.
- Identify a structured approach to reduce or increase their search results without imposing a bias on search results.

This 90 minute workshop will step participants through articulating clinical question of the research evidence and conducting a simple database search, in ways that maintain objectivity in the search results. We will recap on strategies that avoid searching ways that confirm our biases (e.g, avoiding the 'how do I find evidence that proves what I do is the best approach' type of searching.

Participants will require pen and paper, and would benefit from either having two screens available, or be familiar with how to split their screen (so that the presentation platform and a database platform are simultaneously in view). There will be some small group activities as well as individual tasks. This is not a sit and listen session!

Presenter biography

Fiona Graham is a Senior Lecturer with the University of Otago teaching postgraduate interprofessional rehabilitation. Her research areas include telehealth in rehabilitation, knowledge translation and participation focused interventions, particularly for paediatric populations. She resides in Christchurch, New Zealand.

C3: Development and Implementation of an Evidence-Based Guideline for Introducing Powered Mobility to Infants and Toddlers

Dr. Heather Feldner[1], Dr. Teresa Plummer[2], Ms. Alyson Hendry[3]
[1]University of Washington, Seattle, USA. [2]Belmont University, Nashville, USA. [3]Speech and Movement, LLC, Columbus, USA
Dr. Heather Feldner, Assistant Professor
Dr. Teresa Plummer, Professor
Ms. Alyson Hendry, Speech Language Pathologist

Learning objectives

After attending this session, participants will be able to:

1. Describe two ways that principles of family-centered care and evidence-based practice can inform powered mobility device introduction and use for infants and toddlers with disabilities.
2. Understand the purpose and results of an international Delphi consensus survey in developing an evidence-based guideline consensus document for the introduction of powered mobility to infants and toddlers.
3. Discuss three major components of the guideline consensus document and how they are relevant to clinical seating and mobility provision.
4. Synthesize three benefits of interdisciplinary collaboration for facilitating successful introduction of powered mobility devices for infants and toddlers.
5. Describe how the components of the guideline consensus document may support more rigorous international research and clinical work in the future.

Abstract

It is essential to support emerging mobility and exploration for infants and toddlers with disabilities. One means of enacting this support is via access to, and success with, powered mobility as one aspect of multimodal mobility intervention. Pioneering work in this field has led to promising theory and evidence, defining powered mobility learner stages, developing training tools to facilitate driving skills, and amplifying the important ties between mobility, socialization, and cognition. However, between varying policies, attitudes, access to devices, and device design constraints, there remains little standardization of how to introduce powered mobility to infants in a safe and structured manner during an exploratory stage of learning. With the recent introduction of the Permobil® Explorer Mini powered mobility device, the first of its kind designed for children ages 12-36 months, a unique interdisciplinary opportunity arose to address this gap by developing an evidence-based, family-centered guideline for systematically introducing the Explorer Mini and other powered mobility devices to this age group.

This session will be presented in two parts. Part one will describe the processes of guide development, which included an extensive literature review combined with a Delphi Consensus study undertaken with more than 40 international stakeholders (PT, OT, SLP, caregivers) to identify and prioritize critical elements of powered mobility introduction to infants and toddlers. Delphi study results will be shared and literature from across rehabilitation, psychology, child development, and family-centered care will be highlighted. Part two will present a detailed examination of the completed guideline document. Safety, play and communication recommendations, environmental and sensory approaches, and facilitating strategies for structured and unstructured learning across multiple developmental domains will be shared. The session will conclude with exploring how this guideline may support clinical practice and

research in a variety of contexts to maximize outcomes for infants and toddlers learning powered mobility.

Content references:

1) Adolph, K. E., & Hoch, J. E. (2019). Motor development: Embodied, embedded, enculturated, and enabling. *Annual review of psychology*, *70*, 141-164.
2) Bray, N., Kolehmainen, N., McAnuff, J., Tanner, L., Tuersley, L., Beyer, F., ... & Craig, D. (2020). Powered mobility interventions for very young children with mobility limitations to aid participation and positive development: the EMPoWER evidence synthesis. *Health Technology Assessment (Winchester, England)*, *24*(50), 1.
3) Carver, J., Ganus, A., Ivey, J. M., Plummer, T., & Eubank, A. (2016). The impact of mobility assistive technology devices on participation for individuals with disabilities. *Disability and Rehabilitation: Assistive Technology*, *11*(6), 468-477.
4) Feldner, H. A., Logan, S. W., & Galloway, J. C. (2016). Why the time is right for a radical paradigm shift in early powered mobility: the role of powered mobility technology devices, policy and stakeholders. *Disability and Rehabilitation: Assistive Technology, 11*(2), 89-112.
5) Feldner, H. (2019). Impacts of early powered mobility provision on disability identity: A case study. *Rehabilitation psychology*, *64*(2), 130.
6) Feldner, H. A., Logan, S. W., & Galloway, J. C. (2019). Mobility in pictures: a participatory photovoice narrative study exploring powered mobility provision for children and families. *Disability and Rehabilitation: Assistive Technology*, *14*(3), 301-311.
7) Focaroli, V., & Iverson, J. (2017). Children's Object Manipulation: A Tool for Knowing the External World and for Communicative Development. In *The Hand: Perception, Cognition, Action* (pp. 19–26). Springer.
8) Hoch, J. E., O'Grady, S. M., & Adolph, K. E. (2019). It's the journey, not the destination: Locomotor exploration in infants. *Developmental science*, *22*(2), e12740.
9) Nilsson, L., & Durkin, J. (2014). Assessment of learning powered mobility use-Applying grounded theory to occupational performance. *J Rehabil Res Dev*, *51*(6), 963-74.
10) Kenyon, L. K., Jones, M., Breaux, B., Tsotsoros, J., Gardner, T., & Livingstone, R. (2019). American and Canadian therapists' perspectives of age and cognitive skills for paediatric power mobility: a qualitative study. *Disability and Rehabilitation: Assistive Technology*, 1-9.
11) Livingstone, R. W., Bone, J., & Field, D. A. (2020). Beginning power mobility: An exploration of factors associated with child use of early power mobility devices and parent device preference. *Journal of Rehabilitation and Assistive Technologies Engineering*, 7, 1-12.
12) Livingstone, R. & Paleg, G. (2014). Practice considerations for the introduction and use of power mobility for children. *Developmental Medicine & Child Neurology, 56*(3), p. 210-22.
13) Plummer, T., Logan, S. W., & Morress, C. (2020). Explorer Mini: Infants' Initial Experience with a Novel Pediatric Powered Mobility Device. *Physical & Occupational Therapy In Pediatrics*, 1-17.
14) Rosen, L., Plummer, T., Sabet, A., Lange, M.L., & Livingstone, R. (2017). RESNA position on the application of power mobility devices for pediatric users. *Assistive Technology, 12*, 1- 9. doi: 10.1080/10400435.2017.1415575

Presenter biography

Dr. Heather Feldner is an Assistant Professor in the Department of Rehabilitation Medicine, core faculty in the Disability Studies Program, and an Associate Director of the Center for Research and Education on Accessible Technology and Experiences (CREATE) at the University of Washington in sunny Seattle, WA, USA. Her research is centered at the intersection of mobility, disability, and technology in two primary areas: Perceptions of disability and identity and how these emerge and evolve through technology use in children and adults with disabilities; and in the design and implementation of pediatric mobility technology, considering how attitudes and the built environment affect equity and participation. Her current work incorporates multidisciplinary, mixed methods, and participatory approaches drawing from her background as a pediatric physical therapist, doctoral work in disability studies, and postdoctoral research in user-centered rehabilitation and design in mechanical engineering.

Dr. Teresa Plummer, PhD, OTR/L, ATP, CEAS, CAPS holds credentials as an Assistive Technology Professional (ATP), Certified Ergonomic Specialist (CEAS) and Certified Aging in Place Specialist (CAPS). Dr. Plummer has been a practicing occupational therapist since 1979 and has been an invited presenter to Dublin, Switzerland, Singapore, Buenos Aires and many state and national conferences. She has assisted in the development of wheelchair service practice guidelines for North America, Europe and Australia. She also works the International Society of Wheelchair Professionals, selected to serve on the Educators' Package Development to create sustainable evidence - based curriculum for OT/PT programs worldwide. Her areas of research center around participatory methods, qualitative research and user perspectives of mobility devices. Her recent works has been with the Explorer Mini by Permobil, a device cleared by FDA for infants 12-36 months. Her work now centers around creating practice guides and developing research protocols for clinical testing.

Ms. Alyson Hendry, MA, CCC-SLP is a Speech Language Pathologist and Institute for Integrative Nutrition Certified Health Coach. She owns a private practice where she provides speech language pathology services in both English and Spanish for children and their families. Alyson also provides individual and group health coaching for rehabilitation professionals and educators, and offers courses for provision of effective telehealth services. She is passionate about the integration of communication and mobility for children with disabilities.

C4: Access & Independence for Everyone – Enabling independence through power wheelchairs and alternative controls.

Mr Scott Staunton
Sunrise Medical, Wetherill Park, Australia,
Rehabilitation Engineer / Clinical Hub Team at Sunrise Medical

Learning objectives

- Assessment for suitability of alternative controls
- Raise awarenesss in regards to options available for alternative controls
- Raise awareness with regards to modifications possible for powerchairs to enable independence

Abstract

Realising the potential of clients with reduced motor function can result in improved independence and ability to integrate with their environment. Through the provision of powered wheelchairs, alternative drive controls and made to order modifications these limiting factors can be reduced to helping maximise function and independence.

The challenge and goal for therapists when evaluating for appropriate alternative drive controls is knowing what technology is available to enable maximum independence where limiting factors are present and independence where it was thought there were none or limitations were present prior to assessment.

The session will take on a holistic approach to the assessment of alternative drive controls for powered wheelchairs and highlight the importance of the seating, mobility and driving assessment impact on the assessment of specialty controls. Demonstrating the need for special modifications such as powered swing away chin controls and foot operated control systems as an example to help enable independence will also help provide clarity on options that it was thought may have not been available prior to the assessment process.

By the end of the session, each participant will have a good understanding of the assessment process for powered wheelchair controls systems. Be able to establish various options available in regards to alternative control devices and maximise the potential movements of their clients through systems such as:

- Proportional Head control
- Chin Control Systems
- Switched Systems
- Sip and Puff Systems
- Head Array Systems

Assessment techniques will also be discussed in regards to driving competencies allowing participants to apply what has be learned during the session to help achieve the outcomes and goals of their clients. This session will ensure equipment issued can meet the goals of clients: promoting function, independence and integration into the community, ensuring equipment is fit for purpose.

Content references:

1) https://mobilitymgmt.com/articles/2017/06/01/alternative-drive-controls.aspx[BA1]
2) Kamarajetal2014_Quantifying Power wheelchair driving ability
3) Digiovine, C.P., Koontz, A.M., Berner, T. F., Kim, D.J., Schmeler, M., Cooper, R. & Cooper, R.A. (2021) 14 - Wheelchairs and Seating Systems, Braddom's Physical Medicine and Rehabilitation (Sixth Edition), Elsevier, 261-290.e2, https://doi.org/10.1016/B978-0-323-62539-5.00014-X

4) Lange, Michelle; Minkel, Jean, Seating and Wheeled Mobility: A Clinical Resource Guide; Slack Incorporated 2017
5) Koontz AM, Brindle ED, Kankipati P, Feathers D, Cooper RA. Design Features that Impact the Maneuverability of Wheelchairs and Scooters. Archives of Physical Medicine and Rehabilitation May 2010; 91:759-64.
6) Wiart L, Darrah J, Cook A, Hollis V, May L. Evaluation of powered mobility use in home and community environments. Physical & Occupational Therapy in Pediatrics. 2003; 23(2):59-75.
7) Spinal Seating Modules, ACI state Spinal Cord Injury Service NSW Government Australia www.aci.health.nsw.gov.au/networks/spinal-cord-injury/spinal-seating
8) Torkia, Ried, Korner-Bitensky, Power wheelchair driving challenges in the community: A Users' Perspective' Disability and Rehabilitation, 2014, Assistive Technology 10(3)

Presenter biography

Scott Staunton - From the UK and with experience in Prosthetics prior to training with the NHS as a Rehabilitation Engineer in 2003 Scott brings with him 18 years of knowledge and experience in the management of various client populations with relation to the provision of appropriate seating, mobility and pressure reducing equipment. In 2008, Scott moved to Australia and has worked with various equipment suppliers helping to support clients, carers and therapists to help provide a holistic approach to the provision of assistive technology.

Now with the Clinical hub team at Sunrise Medical Scott brings with him a passion for the assessment and management of clients with complex seating and mobility needs, ensuring equipment issued has a positive outcome in relation to the needs of his clients.

D4: 3D Printing for Seating and Mobility Dispensaries - Design and Manufacturing Within a Clinic Based Format

Mr. Richard Pasillas, Mr. Jeremy Cantu, Mr. Victor Carvente
CUSHMAKER 3D, Santa Fe Springs, USA
Mr. Richard Pasillas, Owner/President
Mr. Jeremy Cantu, Quality Control & Production Supervisor
Mr. Victor Carvente, 3D Printing Specialist

Learning objectives

Goals: To share knowledge and firsthand experience regarding an emerging technology that will likely dominate all custom fabrication seating and mobility services in the years to come. To guide the audience to an awareness that portions of this technology are open-source, accessible and within a budget for anyone wishing to venture forward.

Objective 1 - Describe the nature and mechanism of 3D printing technologies as applicable to the seating and mobility industry.

Objective 2 - Spell out which tools or assets are most accessible for expediting mass customization.

Objective 3 - Actuate a plan to integrate 3D printing technologies into one's own workplace or ad hoc field clinic. .

Abstract

As clinicians and fabricators the biggest challenge in dispensing complex rehab services is to problem solve and produce one-of-a-kind solutions, in a timely and efficient manner. Typically, we have numerous technical and commercial avenues to address these challenges. Still, we ultimately must question whether the funding source will provide adequate reimbursement for our proposed one-off solution and whether time constraints, staffing limitations or location circumstances are conducive to the drafted proposal.

Over the past few decades, 3D printing has emerged as a highly viable fabrication tool for one-of-a-kind prototypes and functional end products. In fact, 3D printing technologies have proven to reduce fabrication costs to agile minimums: in terms of labor, materials, floor space, tooling and time to delivery. An even bigger advantage to this technology is that, once a solution is dispensed, its digital profile remains a part of an ever growing library of proven solutions. Subsequently, these archived solutions can be: re-dispensed, further embellished, proportioned to new anthropometrics or even repurposed from a more expedient starting point. More importantly, 3D printing technologies also represent the ideal tool for customization on a broader scale of uses, disciplines and departments. (1)(4)

This didactic presentation will detail numerous aspects in which 3D printing technology is used to dispense a wide range of seating, positioning, mobility, ADL and other related components. Numerous examples will be available for audience members to keenly inspect and manipulate first hand.

The goal for this presentation is to spread awareness and technical insight for these easily accessible, open-source and office compatible fabrication tools. The presenters will highlight 3D printed seating/mobility components from workshops and clinics around the world. Additional discussion will include recommendations for what audience members should look for when making purchasing decisions regarding 3D printers, drawing/slicing software and feedstock. (2)(3)(5)

Content references:

1) The Ten Principles Of 3D Printing 1.https://bigthink.com/experts-corner/the-ten-principles-of-3d-printing

2) 3D Printing Introduction for Occupational Therapists and Students 2. https://tinyurl.com/yy47vgu8
3) A 3D Printed Seat With A Cellular Structure That Molds to Your Butt 3. https://tinyurl.com/yyb64jbd
4) Computer-aided Product Design With Performance-Tailored Mesostructures 4. https://tinyurl.com/y2xxs4q5
5) 3D Printing and Developing Patient Optimized Rehab. Tools (Port) - A Technological Leap. 5. https://tinyurl.com/y5knuo8j

Presenter biography

Richard Pasillas: cushamsterrick@gmail.com, CUSHMAKER 3D. USA
Owner/President of CUSHMAKER 3D. Has spent 42 years in the complex rehab industry as a custom seating specialist. Mr. Pasillas began investigating 3D printing as a seating & mobility fabrication tool in 2006 and produced a proof of concept wheelchair seat cushion, using SLS technology, in February 2013. Mr. Pasillas has designed 90 3D printed products and has delivered over 3000 of these components to wheelchair dependent consumers since 2014.

Jeremy Cantu: jeremyscottcantu79@gmail.com. CUSHMAKER 3D. USA
Quality Control & Production Supervisor for CUSHMAKER 3D. He is responsible for stress testing and quality assurance standards of all deliverable products. He is also involved in product research & development and currently supervises 6 highly specialized fabrication technicians. Mr. Cantu has 23 years experience in DME and Complex Rehab industry and has previously assisted with Lecture presentations at OSS Australia, 2019 and ISS Vancouver, 2020.

D5: Ready to Roll: wheelchair skill development for therapists

Mrs Meg Whitelaw[1], Ms Ulrike Luebcke[2], Ms Amy Hughes[2], Mrs Michelle Smith[2], Miss Jazz Fox[2]
[1]Mobility Solutions, Auckland, New Zealand.
[2]ADHB, Auckland, New Zealand
Mrs Meg Whitelaw, Occupational Therapist
Ms Ulrike Luebcke, Kaiwhakaora Ngangahau
Ms Amy Hughes, Kaiwhakaora Ngangahau
Mrs Michelle Smith, PT
Miss Jazz Fox, Kaiwhakaora Ngangahau

Learning objectives

1. Have been introduced to the resources, tools and techniques used to facilitate wheelchair skill development amongst therapists.
2. Learn about applying wheelchair skills assessment and training with their clients.
3. Take home practical tips and resources that will facilitate provision of wheelchair skills assessment and training.

Abstract

From identifying learning needs to skill competency, the journey of service improvement can take time. In this session we will be offering participants the opportunity to learn about our Ready to Roll wheelchair skill development for therapists within the Mobility Solutions service.

As clinicians working with complex clients, we recognised the need to up skill our team to achieve more effective wheelchair training outcomes. Our goal was to ensure that there is consistency in our practice through having standardised processes and skill level within our team.

Utilising the initial training and experience from Debbie Wilson and the Seating to Go service and drawing on the Wheelchair Skills Programme (Kirby et el.2018) we have embarked on a service improvement journey. We completed a pre wheelchair skills training confidence survey across the team which identified the need for skill development, standard practice procedures and equipment to facilitate safe and effective training. Understanding our client population and improving on client outcomes has guided us in this project.

We have completed a post wheelchair skills training confidence survey across the team with excellent results and helpful feedback for the continuation of the project. Through measuring baseline confidence and setting specific goals we have been able to increase the awareness, skill and confidence level of the therapy team. These outcomes are expected to support clients to become more effective wheelchair users.

In this session we will cover the essential components of wheelchair skills assessment and training for therapists and how we have applied this within our service. We will share the resources developed throughout this mahi which could be of benefit to other service providers thereby weaving people together, whiria te tangata.

Content references:

1) Best, K.l., Routhier, F., & Miller, W.C. (2014). A description of manual wheelchair skills training: current practices in Canadian rehabilitation centres. Retrieved from https://doi.org/10.3109/17483107.2014.907367
2) Keller, L. et al. (2018). Effectiveness of the Wheelchair Skills Training Program: a systematic review and meta-analysis. Retrieved from https://doi.org/10.1080/17483107.2018.1456566
3) Kirby RL, et al. (2019). Wheelchair Skills Program Manual Version 5.1 Dalhousie University, Halifax, Nova Scotia, Canada. Retrieved from

https://wheelchairskillsprogram.ca/wp-content/uploads/WSP-Manual-version-5.0-approved-version.3.pdf
4) Kirby RL, et al. (2019). Effectiveness of a Wheelchair Skills Training Program for Powered Wheelchair Users: A Randomized Controlled Trial. Retrieved from https://doi.org/10.1016/j.apmr.2015.07.009
5) Ozturk, A., Ucsular, F. (2010). Effectiveness of a wheelchair skills training programme for community-living users of manual wheelchairs in Turkey: a randomized controlled trial. Retrieved from https://doi.org/10.1177/0269215510386979
6) Tu, J. et al. (2017). Effectiveness and safety of wheelchair skills training program in improving the wheelchair skills capacity: a systematic review. Retrieved from **https://doi.org/10.1177/0269215517712043**

Presenter biography

Meg Whitelaw is an Occupational Therapist with a special interest in working with clients with complex access needs. She studied OT at the University of Cape Town and went on to complete her second honours degree in augmentative and alternative communication at the University of Pretoria. She spent seven years working in low resourced areas in rural South Africa before moving to New Zealand in 2020. She is currently working as a wheelchair and seating therapist at Mobility Solutions wheelchair seating and assessment service based in Auckland, New Zealand.

Michelle Smith completed her undergraduate degree in Physiotherapy at the University of Pretoria in South Africa. Her interests in wheelchairs stemmed from an undergraduate study completed on the prevalence of shoulder pain in manual wheelchair users. She worked as a sports and orthopaedic physiotherapist for six years before moving to New Zealand in 2019 where she started working as a wheelchair and seating therapist. She has recently stepped into the role of Service Lead at Mobility Solutions wheelchair seating and assessment service based in Auckland, New Zealand.

E3: Mobile shower commode chairs for people with larger bodies.

Emma L. Friesen, PhD

Learning objectives

By the end of this workshop, participants will be able to:

1. Describe at least five steps and tasks associated with going to the toilet
2. Discuss the four seating goals for toileting when an individual uses a mobile shower commode chair
3. Describe Dionne's five bariatric body types;
4. Discuss three posture and positioning challenges for seating people with larger bodies.

Abstract

Toileting, intimate hygiene, and bathing / showering are essential activities of daily living. These activities may involve many tasks, including undressing and dressing, getting onto and off the toilet (perhaps using assistive technology such as mobile shower commode chairs), positioning and repositioning, opening and managing bowel movements, passing urine, maintaining personal hygiene, and managing menstruation.
People with larger bodies may experience unique challenges in undertaking these ADLs. They may require Assistive Technology (AT) with higher weight capacity and size, greater circulation spaces in the physical environment, and additional support surfaces for sitting, lying, and leaning.
People with larger bodies may also require assistance from those in their circle of support, through paid or unpaid caregiving. Caregivers also experience challenges in relation to safely moving and handling people with larger bodies during ADLs.
This workshop introduces participants to toileting, intimate hygiene, and bathing / showering where a person requires mobile shower commode chair.
This workshop will apply the Policy, Human, Activity, Assistance and Technology, and Environment (PHAATE) model to the design and use of AT for toileting and showering, with a specific focus on the needs of people with larger bodies. The PHAATE model provides an easy-to-follow framework for assessing a person's requirements for assistive technologies.
Using the PHAATE model, we'll explore factors influencing design, assessment, selection, and set up of AT, and particularly mobile shower commode chairs. We'll discuss issues with the environment, such as access to the toilet room itself and use of bidets and smart toilets. Finally, we'll consider the impact of Policy on all aspects of provision, including availability of products, access to needed services, and access to funding. The workshop will draw on evidence from recent research in New Zealand and Australian research, and include time for questions and discussion with participants.

Content references

1) Blackett, A., Gallagher, S., Dugan, S., Gates, J. L., Henn, T., Kennedy-Evans, K. L., & Lutze, J. H. (2011). Caring for Persons With Bariatric Health Care Issues: A Primer for the WOC Nurse. *Journal of Wound Ostomy & Continence Nursing, 38*(2), 139-140. doi:10.1097/WON.0000395798.69758.5e

2) Friesen, E. L., Theodoros, D., & Russell, T. G. (2017). Usability of mobile shower commodes for adults with spinal cord injury. *British Journal of Occupational Therapy, 80*(2), 63–72. https://doi.org/10.1177/0308022616676817

3) Hales, C., Curran, N., & de Vries, K. (2018). Morbidly obese patients' experiences of mobility during hospitalisation and rehabilitation: A

qualitative descriptive study. *Nursing Praxis in New Zealand, 34*(1), 20-31.

4) Tanguay, S. (2018). Considerations when working with the bariatric population. In M. L. Lange & J. L. Minkel (Eds.), *Seating and mobility: a clinical resource guide* (pp. 317-332). SLACK Inc.

Presenter biography

Emma L. Friesen, PhD, CPEng(Biomed), B Eng (MfgSys)(Hons), BBus(Mktg), MProfEdTrain.

Emma Friesen is a Rehabilitation Engineer with experience in wheeled mobility and seating. Emma's PhD research, completed in 2016, focused on usability of mobile shower commode chairs. Emma teaches on the design, specification, and set up of mobile shower commode chairs to service providers and end users worldwide.

E4: Cubro Gold Sponsor's Session:

Seating and Positioning – 24-hour posture care

Helen Murray, NZROT

Garry Stanners

24-hour posture care management is crucial for achieving the best client outcomes. Cubro Customer Solution Advisors - Helen Murray (RNZOT) and Garry Stanners - will outline some core fundamentals about seating and positioning, share recent use cases, and help participants gain a deeper understanding of how to avoid negative outcomes.

Presenter biography:

Helen Murray

With more than 26 years' experience as an Occupational Therapist, before joining Cubro Helen worked as a community OT in Christchurch. Helen is particularly passionate about optimising seating and positioning and is an advocate for 24-hour posture care. After identifying a need for improved education and training to help clients and carers understand the importance of optimising positioning, Helen readily shares her knowledge with other therapists and health professionals. Her hope is that doing this, will help to positively influence both a client's progress and health outcomes.

Helen Murray
RNZOT and Cubro Equipment Advisor
e. helen.murray@cubro.co.nz
p. 021 277 0636

Garry Stanners

Garry is one of our most experienced Equipment Specialists, having led our team in Tāmaki Makaurau, Auckland, for more than 18 years. Garry's strength lies in working together with clients, their whanau and therapists, to find practical solutions to complex situations. Fondly regarded as our mobile showering and commode expert, Garry is passionate about helping those in the industry understand the importance of optimising seating and positioning across all equipment solutions.

Garry Stanners
Cubro Equipment Advisor
e. garry.stanners@cubro.co.nz
p. 021 220 1527

A5: Medix 21 Bronze Sponsor Session:

Paediatric Seating in the Classroom

B5: Rehasense Bronze Sponsor Session:

The challenges of power-addons for wheelchair drivers – Rehasense PAWS solutions

D6: Ottobock Bronze Sponsor Session:

Ottobock The Human Empowerment Company

E5: Melrose Bronze Sponsor Session:

Uniquely You, Made in NZ by Melrose Chairs.

A6: The Art and Science of community Mat Evaluations. Toolbox tips to overcome identified barriers.

Amy Bjornson
Sunrise Medical, Sydney, Australia
Clinical Educator

Learning objectives

1. Importance of the Mat Eval; when and why;
2. Understand body planes and ranges of movement to identify reducible vs. non-reducible deformities; and
3. 5 tips to overcome barriers in conducting a MAT assessment independently.

Abstract

Of those therapists surveyed on Australia's east coast, only 28% of respondents reported always completing a Mat Eval (biomechanical assessment) prior to prescribing a seating system. Completion of a MAT assessment assists in the identification of postural abnormalities. This contributes to a wider picture of prescribing the correct supports needed for optimal and functional seating. So why don't we have this as standard practice and execute a systematic approach to seating assessments?

Several barriers to completing a Mat Eval were identified by Therapists when working in both metro and regional community settings;

- lack of mat / plinth,
- need of a second person,
- reduced confidence in locating landmarks / manual handling,
- working with a client who has increased tone, and
- working with a bariatric client.

The assessment usually involves postural assessment of the person in their existing seating system, in supine, and sitting on a firm surface. However, how can this be best managed when practicing on our own? Or not in a clinic setting with equipment? How can we locate body landmarks on a client with significant tone or significant adipose tissue? Whilst no single outcome measure captures all necessary information, a Mat Eval will reveal postural tendencies, postural capacity and provide insight into essential postural supports needed for sitting. This informed decision-making process when prescribing a wheelchair reduces the risk of pressure injuries, increased postural deformities, incorrect prescriptions and associated funding issues. All of which can negatively impact on an individual's quality of life.

In this workshop, participants will learn hands-on techniques and skills to independently assess clients in their current environment, use technology to record data from the assessment and how to interpret results.

Content references:

1) Digiovine, C.P., Koontz, A.M., Berner, T. F., Kim, D.J., Schmeler, M., Cooper, R. & Cooper, R.A. (2021) 14 - Wheelchairs and Seating Systems, Braddom's Physical Medicine and Rehabilitation (Sixth Edition), Elsevier, 261-290.e2, https://doi.org/10.1016/B978-0-323-62539-5.00014-X.
2) Reid D, Laliberte-Rudman D, Hebert D. Impact of Wheeled Seated Mobility Devices on Adult Users' and Their Caregivers' Occupational Performance: A Critical Literature Review. Canadian Journal of Occupational Therapy. 2002;69(5):261-280. doi:10.1177/000841740206900503
3) Isaacson, M. (2011) Best Practices by Occupational and Physical Therapists Performing Seating and Mobility Evaluations, Assistive Technology, 23:1, 13-21, DOI: 10.1080/10400435.2010.541745

4) Kenny S, Gowran RJ. Outcome Measures for Wheelchair and Seating Provision: A Critical Appraisal. British Journal of Occupational Therapy. 2014;77(2):67-77. doi:10.4276/030802214X13916969447119
5) Paulisso, D.C., Schmeler, M.R., Schein, R.M., Allegretti, A.L.C., Batista Campos, L.C., Costa, J.D., Fachin-Martins, E. & Cezar da Cruz, D.M. (2019) Functional mobility assessment is reliable and correlated with satisfaction, independence and skills, Assistive Technology, DOI: 10.1080/10400435.2019.1629125
6) Waugh, K. & Crane, B. (2013) A clinical application guide to standardized wheelchair seating measures of the body and seating support surfaces. Revised Ed. Assistive technology partners, University of Colorado

Presenter biography

Amy Bjornson trained as a Physical Therapist in the United States, Amy has over 20 years' experience working with adult and pediatric neurologic populations, with specialties in the treatment of spinal cord injury, and provision of assistive technology for clients with physical challenges.

Based in Sydney, Amy currently develops and implements national and international training programs on using Assistive Technology to enhance inclusion, health and well-being in those with physical disabilities. She also serves a product improvement and development role for Sunrise Medical, Australia.

Amy is a dynamic speaker who has lectured extensively on seating and mobility. She has also traveled to several developing countries, learning and sharing information with their medical communities.

Amy received her ATP certification in 1995, SMS certification in 2015 and Australian Physiotherapy certification in 2018. She is an active member of Wheelchairs for Humanity, Health Volunteers Overseas and offers technology support to Hidden Treasures Home, Fuzhou China

A7: Invacare Gold Sponsor's session: The Ripple Effect – Evaluation of Foam Configuration in Temperature and Moisture Control

Anna Sokol
Invacare® Matrx® Clinical Education Specialist for Canada

Abstract

The clinicians usually strive to choose back support products that maximize postural support and stability. Recently, however, we hear more and more questions related to temperature and humidity. Prescribers are looking for ways to address the build-up of heat and moisture between the seating product and the skin. Several clinical conditions involving impaired innervation of sweat glands impact sweating function and contribute to increased core temperatures and sensitivity to heat. To prevent heat strokes, some wheelchair users avoid exposures to warm weather and prefer to stay inside.

For many people with thermoregulation issues, lowering the interface temperatures may create the possibility of enjoying the outdoors during summer months without the added weight of ice packs. The new E2 Back with ripple foam was developed with the goal of addressing microclimate without deviating from the Matrx® no-maintenance product philosophy. In this session, we will compare thermo-performance of slab foam versus ripple foam and will describe our findings from four different scenarios the participants were subjected to. We will share the results of the clinical study that demonstrated reductions of both skin temperatures and sweating with the ripple foam.

Content references:

1) Davis, S. L., Wilson, T.E., White, A. T., & Frohman, E. M. (2010). Thermoregulation in multiple sclerosis. Journal of Applied Physiology, 109(5), 1531-1537. doi:10.1152/japplphysiol.00460.2010
2) Griggs, K. E., Leicht, C. A., Price, M. J., & Goosey-Tolfrey. (2015). Thermoregulation during intermittent exercise in athletes with a spinal cord injury. International Journal of Sports Physiology & Performance, 10(4), 469-475.
3) Nouri, A. S., Charalampopoulos, I., & Matzarakis, A. (2018). Beyond singular climatic variables – identifying the dynamics of wholesome thermo-physiological factors for existing/future human thermal comfort during hot dry Mediterranean summers. International Journal of environmental Research and Public Health, 15, 2362
4) Peta, F., Miller, J., Pumpa, K., Thompson, K. G., & Jay, O. (2019). Independent influence of spinal cord injury level on thermoregulation during exercise. 5. Park, K., Tanaka, K., & Tanaka, M. (2014). Uhthoff's phenomenon in multiple sclerosis and neuromyelitis optica. European Neurology, 72, 153-156. doi: 10.1159/000361045
5) Price, M.J. (2006). Thermoregulation during exercise in individuals with spinal cord injuries. Sports Medicine, 36(10), 863-879. doi: 10.1249/MSS.0000000000001978
6) Pritchett, R. C., Al-Nawaiseh, A. M., Pritchett, K. K., Nethery, V., Bishop, P. A., & Green, J. M. (2015). Sweat gland density and response during high-intensity exercise in athletes with spinal cord injuries. Biology of Sport, 32(3), 249- 254. doi: 10.5604/20831862.1163370
7) Wounds Canada (2018). Norton, L., Parslow, N., Johnston, D., Ho, C.,

Afalavi, A., Mark, M., O'Sullivan-Drombolis, D. & Moffat, S. Best Practice Recommendations for the Prevention and Management of Pressure Injuries. In: Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada; 2018 [cited 2019 Sept 4]. 64 p. Available from: https://www.woundscanada.ca/docman/public/health-care-professional/bpr-workshop/172-bprprevention-and-management-of-pressure-injuries-2/file

Speaker Biography

Anna Sokol is the Invacare® Matrx® Clinical Education Specialist for Canada. Anna is a Registered Nurse with Emergency, SCI Rehabilitation, and Community care experiences. Anna has joined Motion Concepts in 2019 and has been an active contributor to the wheelchair seating product development. Anna is a member of ISO/TC 173/SC1/WG11 Wheelchair Seating Workgroup offering nursing expertise and feedback on the wheelchair manufacturing standards. In 2021, she got CNA-certified in wound care specialty. She provides wheelchair seating education to nurses, physiotherapists, occupational therapists, and providers of assistive technology. She is consulted when teams strive to find the best mobility seating approach or deal with conflicting therapeutic goals. Anna is passionate about creating bridges between the disciplines and specialties and explains how attention to seating may offer the missing piece of the puzzle in client safety. The list of audiences Anna presented to includes CAOT (Canadian Association of Occupational Therapists), National Registry of Rehabilitation Technology Suppliers (NRRTS), TVS UK (Tissue Viability Society), and ISS (International Seating Symposium).

B6: Pressure Injuries are Ageist! Why is Ageing a major risk factor for Pressure Injury development?

Rachel Fabiniak
Permobil, Sydney, Australia,
Director Clinical Education

Learning objectives

1. Describe 5 risk factors for Pressure Injuries that can be found in the older aged population.
2. Discuss 2 ways that a pressure injury can impact the ageing individual's participation, independence and well-being.
3. List 3 common areas on the body for pressure injury development

Abstract

Pressure injuries are associated with increased pain and discomfort, decreased quality of life, along with an increase in morbidity and mortality. Pressure injuries are ageist with a tendency to target our older population and yet, they are largely preventable!

According to the 2019 International Guidelines, there are some individuals who have special pressure injury specific needs, due to their medical condition, the setting in which care is delivered and in relation to their age.

In the US, pressure injury care is estimated to cost $11.6 billion/yr. In New Zealand, the total cost of pressure injury treatment is estimated at $694 million/yr. In Australian public hospitals it has been estimated to cost $983 million/yr to treat a Healthcare Associated Pressure Injury.

What is the impact of a pressure injury to an individual? How does this pressure injury impact the person's ability to participate in daily activities, to interact with others and engage in their community? As a clinician you are part of the multidisciplinary approach and can assist as part of the team member in the identification, treatment and prevention of pressure injuries.

This presentation will refer to the 2019 International Guidelines as a basis of best practice for pressure injury prevention and treatment. We will explore the guidelines to build a foundation of understanding of pressure injuries, looking at the definitions, locations and risk factors. We will then refocus our attention to the ageing individual.

Why is the ageing individual at an even greater risk for developing pressure injuries? The factors increasing the susceptibility of pressure injury development with an ageing individual, such as the ageing skin, nutrition and weight loss will be discussed. Finally we will review the current research on pressure injuries and the impact upon the ageing individual's well-being, independence and participation.

Content references:

1) European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline.The International Guideline. Emily Haesler (Ed.) EPUAP/NPIAP/PPPIA: 2019.

2) Carryer J, Weststrate J, Yeung P, Rodgers V, Towers A, Jones M. Prevalence of key care indicators of pressure injuries, incontinence, malnutrition, and falls among older adults living in nursing homes in New Zealand. Res Nurs Health. 2017 Dec;40(6):555-563. doi: 10.1002/nur.21835. Epub 2017 Nov 11. PMID: 29127713.

3) Munoz N, Posthauer ME, Cereda E, Schols JMGA, Haesler E. The Role of Nutrition for Pressure Injury Prevention and Healing: The 2019 International Clinical Practice Guideline Recommendations. Adv Skin Wound Care. 2020 Mar;33(3):123-136. doi:

10.1097/01.ASW.0000653144.90739.ad. PMID: 32058438. https://pubmed.ncbi.nlm.nih.gov/32058438/

4) Klein TM, Andrees V, Kirsten N, Protz K, Augustin M, Blome C. Social participation of people with chronic wounds: A systematic review. Int Wound J. 2020 Dec 13. doi: 10.1111/iwj.13533. Epub ahead of print. PMID: 33314686. https://onlinelibrary.wiley.com/doi/10.1111/iwj.13533

5) Latimer S, Chaboyer W, Thalib L, McInnes E, Bucknall T, Gillespie BM. Pressure injury prevalence and predictors among older adults in the first 36 hours of hospitalisation. J Clin Nurs. 2019 Nov;28(21-22):4119-4127. doi: 10.1111/jocn.14967. Epub 2019 Aug 8. PMID: 31216388. https://pubmed.ncbi.nlm.nih.gov/31216388/

6) Team V, Tuck M, Reeves J, Way M, Enticott J, Evans S, Weller CD. Pressure injury data in Australian acute care settings: A comparison of three data sets. Int Wound J. 2020 Jun;17(3):578-586. doi: 10.1111/iwj.13320. Epub 2020 Feb 6. PMID: 3202709 https://pubmed.ncbi.nlm.nih.gov/32027094/

7) Wilson, L, Kapp, S, Santamaria, N. The direct cost of pressure injuries in an Australian residential aged care setting. Int Wound J. 2019; 16: 64– 70. https://doi.org/10.1111/iwj.12992

Presenter biography

Rachel Fabiniak began her studies at The Georgia Institute of Technology, where she graduated with her Bachelor of Science in Biology in 2009. Rachel then went on to receive her Doctorate in Physical Therapy from Emory University in 2013.

After receiving her doctorate, Rachel went into clinical practice as a physiotherapist in the Spinal Cord Injury Day Program at Shepherd Center in Atlanta, Ga. There she developed a passion for seating and mobility which ultimately led to her career with Permobil in 2018. In 2020, Rachel became Director of Clinical Education for Asia-Pacific

B7: Wheelchair and seating solutions for people with multiple sclerosis

Ms Rachel Brown
Enable New Zealand, Christchurch, New Zealand
EMS Advisor - Outreach Wheelchairs and Seating

Learning objectives

1. Identify four key factors to consider when assessing someone with multiple sclerosis (MS) for a wheelchair.
2. Describe the advantages of three power seating functions for people with MS.
3. Name a cushion and back support that are clinically indicated and have functional benefits for someone who has MS.

Abstract

Multiple sclerosis (MS) is a chronic neurodegenerative disease of the central nervous system (1).

Within 15 years of the disease onset 50% of people with MS will have difficulties with mobility (2).

As the disease progresses people with MS transition from walking to using a manual wheelchair (MWC) and generally become power wheelchair (PWC) users; with their seating needs changing along the way. This session will explore the symptoms associated with MS and the wheelchair and seating solutions that maybe prescribed.

The International Classification of Function will be used to identify factors to consider when assessing someone with MS (3).

These include range of motion, spasticity (4, 5 & 6), fatigue (6 & 7), pain (8), cognitive function (9), pressure, sweating, transfers (10), mobility/walking (4, 11 & 12), and falls (9, 13 & 14). Considerations around activities of daily living, participation, environmental and personal factors will be identified.

In New Zealand wheelchair and seating solutions can be funded by the Ministry of Health for people with MS. Statistics have been reviewed relating to the provision of this equipment to identity any prescriptive themes.

The literature around MWC use (2, 15 & 16), considerations when scripting MWCs and why PWCs are prescribed for people with MS will be identified (2 & 16).

The clinical indicators/functional benefits of drive wheel configuration (12), power posterior tilt (2, 12, 16, 17 & 18), anterior tilt (12), recline (12, 17 & 18), elevating lower leg supports (12, 17 & 18), elevate (12 & 19), and power standing (20 & 21) will be discussed.

PWC electronics (12 & 22) and control methods will be mentioned.

The clinical indicators/functional benefits of cushion and back supports will be examined and the importance of reassessing people with MS will be highlighted (23)

Content References:

1) Nuray, A., Vedat, C., Aysel, M. & Abdullah, Y. (2019). Comparison of upper and lower extremity functions in primary and secondary progressive multiple sclerosis patients. *Medical Science*, 39(4), 389-394.
2) Souza, L.H. & OFrank, A. (2015). Problematic clinical features of powered wheelchair users with severely disabling multiple sclerosis. *Disability in Rehabilitation*, 37(11), 990-996.
3) World Health Organization. (2001). *International classification of*

functioning, disability and health. Geneva: World Health Organization.

4) Jeng, B., Sandroff, B. M. & Motl, R. W. (2018). Energetic cost of walking and spasticity in persons with multiple sclerosis with moderate disability . *Neurorehabilitation*. 43, 483- 489.
5) Norbye, A. D., Midgard, R. & Thrane, G. (2018). Spasticity, gait, and balance in patients with multiple sclerosis: A cross-sectional study. *Physiotherapy Research International,* 25(1), 1-9.
6) Karbatkin, H., Babyar, S., DiCarrado, S., McCarby, M., Narovlianski, M., Perez, B. et al. (2018). *Neurodegenerative Disease Management*, 8(3), 143-150.
7) Mulligan, H., Wilkinson, A., Barclay, A, Whitling, H., Heynike C., Snowdon, J. (2016). Evaluation of a Fatigue Self-Management Program for People with Multiple Sclerosis. International Journal of MS Care. 18, 116-121.
8) Lalkhan, A. G., Bedford, J. P., & Dwyer, A.D. (2012). Pain associated with multiple sclerosis: epidemiology, classification, and management. *British Journal of Neuroscience Nursing*. 8(5), 270-274.
9) Rice, L., Kalron, A., Berkowitz, S. H., Backus, D. & Sosnoff, J. J. (2017). Fall prevalence in people with multiple sclerosis who use wheelchairs and scooters. *Medicine.* 96(35), 1-7.
10) Bowser, B., O'Rourke, S., Brown, C. N. White, L. & Simpson, K. J. (2015). Sit-to-stand biomechanics of individuals with multiple sclerosis. *Clinical Biomechanics*. 30, 788-794.
11) McLoughlin, J., Barr, C., Crotty, M., Lord, S. R. & Sturnieks, D. L. (2015). Association of postural sway with disability status and cerebellar dysfunction in people with multiple sclerosis: A Preliminary Study. *International Journal of MS Care*. 17(3), 146-151.
12) Lange, M., & Minkel, J. L. (Eds.). (2018*). Seating and wheeled mobility: A clinical resource guide*. New York: Slack Incorporated.
13) Rice, L. A., Peterson, E. W., Backus, D., Sung, J. H., Yarnot, R., Abou, L., et al. (2019). Validation of an individualized reduction of falls intervention program among wheelchair and scooter users with multiple sclerosis. *Medicine*. 98(19), 1-10.
14) Sung, J. H., Trace, Y., Peterson, E. W., Sosnoff, J .J., & Rice, L. A. (2019). Falls among full-time wheelchair users with spinal cord injury and multiple sclerosis: A comparison of characteristics of fallers and circumstances of falls. *Disability and Rehabilitation*. 41(4), 389-395.
15) Verza, R., Battaglia, M. A., & Uccelli, M. M. (2010). Manual wheelchair propulsion pattern use by people with multiple sclerosis. *Disability and Rehabilitation: Assistive Technology*. 5(5), 314-317.
16) Souza, A., Kelleher, A., Cooper, R., Cooper, R.A., Lezzoni, L. I., Collins, D. M. (2010). Multiple sclerosis and mobility-related assistive technology: Systematic review of literature. *Journal of Rehabilitation Research and Development*. 47(3), 213-224.
17) OFrank, A. & DeSouza, L. H. (2015). Therapeutic roles of electric powered indoor outdoor wheelchairs in multiple sclerosis. *Equipment Services*. 7, 82-85.
18) RESNA (2015). *RESNA Position paper on the application of tilt, recline, and elevating legrests for wheelchairs literature update*. Arlington. RESNA
19) RESNA (2019). *RESNA Position paper on the application of seat elevation devices for power wheelchair user's literature update*. Arlington. RESNA.
20) RESNA (2013). *RESN*A *Position paper on the application of wheelchair standing devices: Current state of the literature*. Arlington. RESNA
21) Permobil. (2021). *Permobil white paper : A systematic review of the*

evidence of power standing wheelchairs. Sweden: Permobil
22) Mahajan, H. P., Spaeth, D. M., Dicianno, B. E., Brown, K., & Cooper, R. A. (2014). Preliminary evaluation of a variable compliance joystick for people with multiple sclerosis. *Journal of Rehabilitation Research and Development*. 51(6), 951-962.
23) Dolan. M. J. & Henderson, G. H. (2014). Patient and equipment profile for wheelchair seating clinic provision. Disability and Rehabilitation Assistive Technology. (9)20, 136-143.

Presenter biography

Rachel Brown graduated as an occupational therapist in 1995. She has worked in a variety of adult and paediatric services within New Zealand and overseas. Most of her practice has been in community settings and included wheelchairs and seating interventions . Rachel has been in her current role with Enable New Zealand since 2010. She is passionate about wheelchairs and seating and has high number of people with MS on her case load. Rachel has published two articles on lying supports, one on back supports and has presented at other symposiums on these topics.

C6: The Wheel Story: Impact of Wheels and Tires on Manual Wheelchair Performance and Propulsion Efficiency

Curt Prewitt[1], PT, MPT Deborah Pucci[2]
[1]Ki Mobility, LLC, Stevens Point, Wisconsin, USA. [2]Ki Mobility, LLC, Stevens Point, WI, USA
MS, PT, ATP Curt Prewitt, Director of Education
PT, MPT Deborah Pucci, Clinical Educator

Learning objectives

Attendees will be able to:

1. List three features of caster wheels and explain how they influence manual wheelchair propulsion efficiency.
2. List three features of drive wheels and explain how they influence manual wheelchair propulsion efficiency
3. Explain three characteristics of drive surfaces and explain how they impact manual wheelchair drive wheel and caster selection

Abstract

Imagine a meticulously configured ultralightweight rigid manual wheelchair, set-up for the user's anatomic measurements, postural support needs, and skill level. The wheelchair has an aggressive axle position and is stripped down of secondary components, such as anti-tippers, armrests or even wheel locks. The end user is expecting a highly efficient, high-performance wheelchair. Now, imagine the chair being issued equipped with mag wheels and pneumatic tires with flat-free inserts.

Research is giving us new insights into the impact of wheel and tire selection as a critical influencer of performance. Are we considering the right factors and context when it comes to wheel and tire selection? Wheel and tire selection on manual wheelchairs often comes down to choosing the standard, no-additional-cost option, or may be based on an assumption that a user is not able or willing to maintain wheels and tires that require it. Are we providing end users an explanation of what to consider, and giving them the options to determine how much maintenance they are willing to accept?

An understanding of materials, and the physical and performance characteristics of wheels and tires, can contribute to improved decision making regarding the selection of a critical aspect of wheeled mobility: the wheeled part. This presentation will address the science of wheels and tires and review current research findings on the impact of selection and setup on wheelchair performance and propulsion efficiency. Attendees will be provided practical considerations to equip them to make appropriate wheel and tire selection when configuring manual wheelchairs.

Content references:

1) Caspall, Jayme J., et al. "Changes in Inertia and Effect on Turning Effort across Different Wheelchair Configurations." *Journal of Rehabilitation Research and Development*, vol. 50, no. 10, 2013, pp. 1353–62. *DOI.org (Crossref)*, doi:10.1682/JRRD.2012.12.0219.
2) Lin, Jui-Te, et al. "Evaluation of Wheelchair Resistive Forces during Straight and Turning Trajectories across Different Wheelchair Configurations Using Free-Wheeling Coast-down Test." *Journal of Rehabilitation Research and Development*, vol. 52, no. 7, 2015, pp. 763–74. *DOI.org (Crossref)*, doi:10.1682/JRRD.2014.10.0235.
3) Kwarciak, Andrew M., et al. "Evaluation of Wheelchair Tire Rolling Resistance Using Dynamometer-Based Coast-down Tests." *The Journal of Rehabilitation Research and Development*, vol. 46, no. 7, 2009, p.

931. *DOI.org (Crossref)*, doi:10.1682/JRRD.2008.10.0137.
4) Sawatzky, Bonita, et al. “The Ergonomics of Different Tyres and Tyre Pressure during Wheelchair Propulsion.” *Ergonomics*, vol. 47, no. 14, Nov. 2004, pp. 1475–83. *Taylor and Francis+NEJM*, doi:10.1080/00140130412331290862.
5) Sauret, Christophe, et al. “Assessment of Field Rolling Resistance of Manual Wheelchairs.” *The Journal of Rehabilitation Research and Development*, vol. 49, no. 1, 2012, p. 63. *DOI.org (Crossref)*, doi:10.1682/JRRD.2011.03.0050.
6) Sprigle, Stephen, et al. “Measurement of Rolling Resistance and Scrub Torque of Manual Wheelchair Drive Wheels and Casters.” *Assistive Technology*, Dec. 2019, pp. 1–13. *DOI.org (Crossref)*, doi:10.1080/10400435.2019.1697907.
7) Sprigle, Stephen, and Morris Huang. “Manual Wheelchair Propulsion Cost across Different Components and Configurations during Straight and Turning Maneuvers.” *Journal of Rehabilitation and Assistive Technologies Engineering*, vol. 7, Apr. 2020. *PubMed Central*, doi:10.1177/2055668320907819.
8) Zepeda, Rene, et al. “The Effect of Caster Wheel Diameter and Mass Distribution on Drag Forces in Manual Wheelchairs.” *Journal of Rehabilitation Research and Development*, vol. 53, no. 6, 2016, pp. 893–900. *DOI.org (Crossref)*, doi:10.1682/JRRD.2015.05.0074.

Presenter biography

Curt Prewitt is Director of Education for Ki Mobility. He has a BS in Exercise Physiology and an MS in Physical Therapy from the University of Colorado.

He practiced as a physical therapist in a number of settings for a few years, most prominently in long term care, where he gained experience with seating and wheeled mobility. He transitioned from a practicing therapist to a manufacturer’s representative, eventually moving into sales management and focusing on complex rehab technology. Throughout his tenure on the manufacturer’s side in the complex rehab arena, he has dealt largely with pediatric positioning and mobility products. He has previously also served as a product trainer/product specialist, teaching product features and clinical application, as well as coordinating continuing education presentations, both credited and non-credited. He has presented continuing professional education courses across the US and internationally.

C7: Allied Medical Platinum Sponsor's session:

Supportive Seating: Matching prescription to provision, for all children.

Laura Finney

James Gilmour

D7: Made to Move - I am

The use and value of seated balance based movement technology and how moving with balance can change a life.

Marcus Thompson
OMEO, New Zealand

Learning objectives

1. To understand when to use 'seated balance based movement technology', by exploring how such a tool works in partnership with a user.
2. Develop knowledge of function, performance and outcome to clarify how to assess the suitability of the tool in relation to a broad range of users.
3. To develop an understanding of the 'value' of using 'seated balanced based movement technology' from the client and whanau perspective. To be done through the lens of the Omeo story.

Abstract

Purpose - understanding what seated balanced based mobility technology does, how to assess when it should be used and establishing value from the clients perspective.

People are made to move - it is a core human function. When mobility issues exist, the impact on life goes beyond the obvious challenges of achieving a task, our motivation and sense of self are challenged, without movement through balance our rhythm in life is altered, and in that space we establish or re-establish our identity of 'I AM'.

It is in this space where good design with smart technology gives us tools of partnership. And in this case 'seated balanced based movement technology'.

A partnership tool that affords a person to be more whole, should be used by every one - but there are parameters for safe and sustainable use with the products currently available. To establish the suitability for a client requires the assessment of learning and physical capability, fit, motivation, durability, decision making, control, character, logistical support and motivation. For a robust suitability assessment clear trials and an understanding of the functional and performance parameters of the tool / client partnership are required.

Value - the biggest part of the story - success as measured by the client using a tool regularly by choice.

Through the lens of the 10 year Omeo story and case studies explore:

Range of users
Task
Feel
Motivation to move
Mobilisation of body
Exercise
Cognitive action
Skill acquisition
Increased use of sensory system
Freedom - empowerment
Engagement - connections - family / society / self
Movement coordination rhythm
Productivity

Content references:

Presenter biography:

Marcus Thompson DFA, DipTch - T12 Paraplegic (17yrs) Omeo user / Design team member,
Educationalist, Industry specialist.
Marcus is the User Experience and Training Manager for Omeo Technology. As a central team member in the development of the Omeo he has developed and established best practice for user assessment and placement, riding, user training, agent and coach training for the device.

D8: How Mental Health is Impacted by Mobility: A look into the evidence

Ms Rainy Wu
Permobil, Shanghai, China
Clinical Education Specialist

Learning objectives

1. Discuss two ways that activities and participation are impacted for an individual after a spinal cord injury.
2. Provide 2 points on the economic and financial impact on participation from both an individual and government funding level.
3. Discuss 3 ways that participation can be negatively impacted by the environment and personal factors.

Abstract

How is participation impacted by a lack of mobility? This presentation will investigate the research behind mental health and its impacts on participation for individuals with a spinal cord injury.

Depression has been investigated as major psychological problem after SCI (Cardozo 2007). One year post injury, 11.5% of individuals with an SCI were reported to have probable major depression which was greatly associated with individuals' health, satisfaction with life and daily role functioning (Bombardier et al. 2004).

This presentation will consider the relationship between the loss of mobility and mental health. We will begin by looking at the ICF framework and dis cussing each interaction between mental health and the health condition, body function and structures, activities, participation, the environment and personal factors. Participation and community reintegration is not based on the health condition alone, but other factors such as environmental barriers, financial issues, and government policies should be considered when creating a plan for the individual's community reintegration.

Both across and within countries we see variations in factors associated with community reintegration. This presentation will end with a look into the current situation in China, focusing on the challenges for community reintegration faced by an individual following an SCI.

Content references:

1) Silver J, Ljungberg I, Libin A, Groah S. Barriers for individuals with spinal cord injury returning to the community: a preliminary classification. Disabil Health J 2012; 5: 190-6.
2) Martin P, Cherian B, John J, Tharion G, Bhattacharjee S. Long-term follow-up of persons with spinal cord injury integrated in the community. Int J Ther Rehabil 2010; 17: 76-83.
3) Scovil CY, Ranabhat MK, Craighead IB, Wee J. Follow-up study of spinal cord injured patients after discharge from inpatient rehabilitation in Nepal in 2007. Spinal Cord 2012; 50: 232-7.
4) Donnelly C, Eng JJ. Pain following spinal cord injury: the impact on community reintegration. Spinal Cord 2005; 43: 278-82.
5) Hu X, Zhang X, Gosney JE, Reinhardt JD, Chen S, Jin H, et al. Analysis of functional status, quality of life and community integration in earthquake survivors with spinal cord injury at hospital discharge and one-year follow-up in the community. J Rehabil Med 2012; 44:200-5.
6) Carpenter C, Forwell SJ, Jongbloed LE, Backman CL. Community participation after spinal cord injury. Arch Phys Med Rehabil 2007; 88: 427-33.
7) Dickson A, Ward R, O'Brien G, Allan D, O'Carroll R. Difficulties adjusting to post-discharge life following a spinal cord injury: an interpretative

phenomenological analysis. Psychol Health Med 2011; 16: 463-74.
8) Babamohamadi H, Negarandeh R, Dehghan?Nayeri N. Barriers to and facilitators of coping with spinal cord injury for Iranian patients: A qualitative study. Nurs Health Sci 2011; 13: 207-15.
9) Sekaran P, Vijayakumari F, Hariharan R, Zachariah K, Joseph SE, Kumar RS. Community reintegration of spinal cord-injured patients in rural south India. Spinal Cord. 2010;48 :628.
10) Chappell P, Wirz S. Quality of life following spinal cord injury for 20-40 year old males living in Sri Lanka. Asia Pac Disabil Rehabil J 2003; 14:162-78.
11) Cardozo CP. Respiratory complications of spinal cord injury. J Spinal Cord Med 2007; 30: 307-8.
12) Levi R, Hultling C, Nash M, Seiger A. The Stockholm spinal cord injury study: 1. Medical problems in a regional SCI population. Paraplegia 1995; 33: 308-15.
13) Kilic SA, Dorstyn DS, Guiver NG. Examining factors that contribute to the process of resilience following spinal cord injury. Spinal Cord 2013; 51: 553-7.
14) Hammel J, Magasi S, Heinemann A, Gray DB, Stark S, Kisala P, et al. Environmental barriers and supports to everyday participation: a qualitative insider perspective from people with disabilities. Arch Phys Med Rehabil 2015; 96: 578-88.
15) Chhabra H, Bhalla A. Influence of socio-economic status on access to different components of SCI management across Indian population. Spinal Cord 2015; 53: 816-20.
16) Dijkers MP. Correlates of life satisfaction among persons with spinal cord injury. Arch Phys Med Rehabil 1999;80:8676-6.
17) Dijkers MP. Quality of life of individuals with spinal cord injury: a review of conceptualization, measurement, and research findings. J Rehabil Res Dev 2005; 42: 87-110.
18) Singh R, Dhankar SS, Rohilla R. Quality of life of people with spinal cord injury in Northern India. Int J Rehabil Res 2008; 31: 247-51.
19) Bruno Trezzini, Urban Schwegler, Jan D. Reinhardt for the SwiSCI Study Group. Work and wellbeing-related consequences of different return-towork pathways of persons with spinal cord injury living in Switzerland. Spinal Cord (2018) 56:1166–1175
20) Liu P, Yao Y, Liu MY, et al: Spinal trauma in mainland China from 2001 to 2007: an epidemiological study based on a nationwide database. Spine (Phila Pa 1976) 2012;37:1310–5
21) Ning GZ, Yu TQ, Feng SQ, et al: Epidemiology of traumatic spinal cord injury in Tianjin, China. Spinal cord 2011;49:386–90
22) Forchheimer M, Tate DG. Enhancing community re-integration following spinal cord injury. NeuroRehabilitation 2004;19:103-13.
23) US Department of Transportation. 14 CFR part 382: nondiscrimination on the basis of disability in air travel. 2003. Available at: http://www.dotcr.ost.dot.gov/asp/airacc.asp. Accessed September 22, 2006.
24) Holicky R, Charlifue S. Aging with spinal cord injury: the impact of spousal support. Disabil Rehabil 1999;21:250-7.
25) Scelza WM, Kalpakjian CZ, Zemper ED, Tate DG. Perceived barriers to exercise in people with spinal cord injury. Am J Phys Med Rehabil 2005;84:576-83.
26) Craig A, Hancock K, Dickson H. Improving the long-term adjustment of spinal cord injured persons. Spinal Cord 1999;37: 345-50.
27) Tate DG, Forchheimer MB, Krause JS, Meade MA, Bombardier CH. Patterns of alcohol and substance use and abuse in persons with spinal cord injury: risk factors and correlates.

Arch Phys Med Rehabil 2004:85:1837-47.
28) Bombardier CH, Richards JS, Krause JS, Tulsky D, Tate DG. Symptoms of major depression in people with spinal cord injury: implications for screening. Arch Phys Med Rehabil 2004;85: 1749-56.
29) Krause JS, Kemp B, Coker J. Depression after spinal cord injury: relation to gender, ethnicity, aging and socioeconomic indicators. Arch Phys Med Rehabil 2000:81:1099-109.
30) Kishi Y, Robinson RG, Kosier JT. Suicidal ideation among patients with acute life-threatening physical illness: patients with stroke, traumatic brain injury, myocardial infarction, and spinal cord injury. Psychosomatics 2001;42:382-90.
31) Rish BL, Dilustro JF, Salazar AM, Schwab KA, Brown HR. Spinal cord injury: a 25-year morbidity and mortality study. Mil Med 1997;162:141-8.
32) Kreuter M. Spinal cord injury and partner relationships. Spinal Cord 2000;38:2-6.
33) Post MW, Bloemen J, deWitte LP. Burden of support for partners of persons with spinal cord injuries. Spinal Cord 2005;43:311-9.

Presenter biography

Rainy Wu joined Permobil China in March 2020, as a clinical education specialist. Originally from Taiwan, she graduated in Physical Therapy and Assistive Technology with a bachelor's degree from National Yang Ming University in 2012. Rainy went into New Taipei City Assistive Technology Centre as a physiotherapist, performing the assessment of assistive devices for government reimbursement. Also, she executed the assessment of barrier-free home environment and provided recommendations of homecare assistive technology for the ageing individuals and individuals with disabilities. At the same duration, she worked for several special education schools, offering physical therapy consultation and applying assistive devices for students who need assistance in schools from The Ministry of Education. Rainy moved to Shanghai in 2018 and worked in a private clinic. As the rehabilitation industry is increasingly thriving within China, her experience and passion in the field of assistive technology led to her career with Permobil.

E6: The Impact of Seating and Positioning on Respiratory System Function

Ms. Lois Brown
ILS Rehab, Adelaide, Australia
National Clinical Education Manager

Learning objectives

The participant will be able to:

1. Identify at least three rapid, easy-to-use methods to identify changes in respiratory system performance during the seating and mobility evaluation.
2. State the name of three planes of movement involved in the mechanics of breathing.
3. State at least three potential seating solutions to maximize respiratory function in the wheelchair.

Abstract

When fitting patients for a seating system, close attention is paid to posture, function and pressure distribution. However, little consideration is given to the impact that postural changes and structural supports can have on respiratory function. There is an inter-dependent relationship between respiratory function and positioning and is affected by our seating and positioning solutions. Specifically, this course will increase awareness of the cross-functional relationship between the cardiopulmonary system and postural alignment without compromising breathing mechanics. The mechanics of breathing are directly impacted by skeletal alignment of the spinal column and rib cage and the freedom of movement of the diaphragm. This is most directly impacted by the lack of postural control and at times attempts to "over-correct" postural asymmetry with primary and secondary seating supports. This presentation will focus on objective **respiratory measures** that can be used **during wheelchair assessments** to determine the effect the seating and positioning intervention has on the patient. The effects of the diagnosis on respiratory function, seating systems and angles of positioning will be discussed. Evidence based research such as studies from Mary Massery, PT, PhD confirm the need to create client solutions that "generate, regulate and maintain trunk pressures for optimal respiratory mechanics and postural alignment." [1] Other research will be shared that support this approach. In addition, the effects of the diagnosis on respiratory function, seating systems and angles of positioning will be discussed.

Content references:

1) Frownfelter, D. and M. Massery (2006). Body Mechanics-The Art of Positioning and Moving Patients. Cardiovascular and Pulmonary Physical Therapy Evidence and Practice, ed. 4D. Frownfelter and E. Dean. St Louis, MO, Elsevier Health Sciences: Chapter 42.
2) 2. Massery, M., Breathing and Upright Posture: Simultaneous Needs, in 26th International Seating Symposium, Vancouver, BC. March 11-13, 2010;25-28.
3) Massery M. Multisystem Consequences of Impaired Breathing Mechanics and/or Postural Control. In: Cardiovascular and Pulmonary Physical Therapy Evidence and Practice. 4th ed. Frownfelter D, Dean E. St. Louis, MO: Elsevier Health Sciences; 2006

Presenter biography

Lois Brown, MPT (US), RESNA ATP/SMS is a seating and Mobility Consultant in Australia and currently the National Clinical Education Manager at ILS in Australia. Lois has 29 years of experience as a physical therapist, consultant and prescriber of AT, manager of funding review for a national US supplier, and

manager of clinical education for a global wheelchair supplier and manufacturer. Lois has presented Nationally and Internationally on Seating and Mobility and Assistive Technology, at ISS, ESS, OSS, CSMC, and RESNA for many years. Lois has been published in many Rehab Publications and is considered an expert in her field.

E7: Sunrise Medical Sponsor's session: Converting Energy into Motion – Quickie Nitrum

Amy Bjornson
Clinical Director – Asia Pacific
Sunrise Medical, Sydney, Australia

Abstract

Wheelchairs have rapidly evolved in recent years. It's now possible to find wheelchairs offering a super light-weight frame with adjustability and unparalleled energy efficiencies. These new ultralightweight wheelchairs are possible due to advances in materials, technology and designs. New ideas in shapes, structures and engineering are producing better, lighter and efficient manual wheelchairs. Come join us to learn about the Quickie Nitrum series

Presenter biography

Amy Bjornson trained as a Physical Therapist in the United States, Amy has over 20 years' experience working with adult and pediatric neurologic populations, with specialties in the treatment of spinal cord injury, and provision of assistive technology for clients with physical challenges.

Based in Sydney, Amy currently develops and implements national and international training programs on using Assistive Technology to enhance inclusion, health and well-being in those with physical disabilities. She also serves a product improvement and development role for Sunrise Medical, Australia.

Amy is a dynamic speaker who has lectured extensively on seating and mobility. She has also traveled to several developing countries, learning and sharing information with their medical communities.

Amy received her ATP certification in 1995, SMS certification in 2015 and Australian Physiotherapy certification in 2018. She is an active member of Wheelchairs for Humanity, Health Volunteers Overseas and offers technology support to Hidden Treasures Home, Fuzhou China

ABSTRACTS:

Wednesday 6th April 2022

PLENARY: Understanding purpose in the collision of profession and parenthood.

Dr Tim Adlam

How I understood the purpose of technology in the collision of profession and parenthood when my twin sons Jonathan and David were born. David lived only 20 minutes with anencephaly, and Jonathan who has CP, autism and CVI, is now sixteen and thinking about his future. As I tell my story of being a father to Jonathan and my work with disabled children and people with dementia, I will explore what technology is for, how we create technology that works, and some thoughts about the global future of technology for disabled people.

Presenter Biography

Dr Tim Adlam is an Associate Professor of Global Disability Innovation at UCL Global Disability Innovation Hub in London, and director of the multidisciplinary MSc in Disability, Design and Innovation. For over 20 years, Tim has worked to create technology to enable disabled people to do what they want to do, working across physical and cognitive disability, including early powered mobility and dynamic seating for children with dystonia. He advocates a thoroughly engaged approach that solves problems that matter to disabled people with beautiful, useful and usable technology. Children are born curious so it is important that we enable all children to do what they love to do: to explore and discover the unknown in the world and in themselves. To do this, they need to move. Tim is father of a child with autism and cerebral palsy who has taught him never to make assumptions about what is possible.

A8: "Bridging the Gap" - Implementing a community therapist led wheelchair assessment clinic within inpatient rehabilitation wards.

Angela Kennedy
Canterbury DHB, Christchurch, New Zealand
Physiotherapist

Learning objectives

1. To understand current challenges of working within DHB system to provide timely and accurate equipment provision.
2. To look at a different way to deliver service and improve the patient journey from inpatient to outpatient services
3. To look at innovative ways to educate emerging therapists and maintain accreditation for those existing therapists
4. Review of waiting times, therapist satisfaction and outcomes for clients

Abstract

Burwood hospital is a large rehabilitation hospital based in Christchurch, NZ. It consists of wards dedicated to stroke, older persons health, brain injury, orthopaedic and spinal injury rehabilitation. In Christchurch most of our MOH level 2 wheelchair and seating assessors are based in the community setting which is not currently directly attached to the hospital. Increasing concerns around long delays in referral, lost applications, prescription errors, communication breakdowns and difficulties with clinical support for inpatient staff led to a pilot of an inpatient assessment clinic for clients over 65 that was led by our community level assessors.

This presentation outlines how we went about reviewing, planning and implementing the inpatient wheelchair clinic and our results over the last 2 years.

Content references:

1) World Health Organization, 2015, *WHO Wheelchair Service Training Package for managers and stakeholders*, World Health Organization, Geneva, viewed 15 June 2017, from http://www.who.int/disabilities/technology/wheelchairpackage/wstpmanagers/en/
2) GoldbergM, PearlmanJ, RushtonP, et al. The International Society of Wheelchair Professionals (ISWP): a resource aiming to improve wheelchair services worldwide. Br J Occup Ther. 2018;81:671–672.
3) ISO 16840-1:206 - Wheelchair seating — Part 1: Vocabulary, reference axis convention and measures for body segments, posture and postural support surfaces

Presenter biography

I am a Community based physiotherapist who has worked within the CDHB for 25 years (excluding the obligatory few years in UK). I have a special interest in wheelchair and seating provision, education and service development and worked within a specialist wheelchair and seating service for a number of years before moving to generalised community work. Due to increasing demands on the sector we are always looking for ways to improve service delivery for our clients and best utilise the staffing resource we have available. At home I have a grumpy husband, 2 grumpier teenage children, 2 loving dogs and an indifferent cat

A9: Breaking New Ground: Establishing an advanced practitioner (Wheelchair & Seating) role in Hawkes Bay.

Antjedine Borchers
Advanced Practitioner wheelchair & seating / Occupational Therapist
Hawkes Bay DHB, Hastings, New Zealand

Learning objectives

1. describe role of Advanced Practitioner in wheelchair and seating at HBDHB
2. compare wheeled mobility service delivery at HBDHB to their own
3. identify need of support for therapists gaining and keeping Level 2 WMPM Enable accreditation

Abstract

Hawke's Bay DHB went through a period where they lost experienced therapists, leading to increased expectations for less experienced therapists, poorer outcomes and longer waitlists for clients, increased stress and decreased job satisfaction for therapists and a struggling service overall. About two years ago there was only one therapist with Wheeled Mobility and Postural Management Level 2 accreditation left at the DHB.

A new, innovative approach was needed, and an Advanced Practitioner role for wheelchair and seating was created. Establishing a new role comes with challenges. The lofty goals set for this role included:

- Providing safe and clinically effective comprehensive assessment and intervention, with demonstration of advanced knowledge and skills to manage complex presentations to patients and their whānau.
- Provide clinical leadership in wheelchairs and seating for therapists in multiple services, including rural areas, acute inpatient teams, adult community teams and child development services.
- To ensure and prioritise a focus on safe and high-quality patient care while weaving together teaching and learning for clinicians.
-

There have been huge achievements in the first year of the role that have proven the value of an Advanced Practitioner role in wheelchairs and seating.

- Reduction in waitlist for patients requiring assessment at all levels
- Monthly Special Interest Groups which have included in-services, presentation of case studies, manual wheelchair skills training and equipment review
- Progress towards regular wheelchair and seating reviews for adults
- A workforce who feel supported and now has an increased interest in gaining accreditation

Conclusion: The establishment of a ground-breaking Advanced Practitioner Role (wheelchair and seating) in Hawke's Bay has turned around the service. The outcomes for patients and clinicians have been significant, and the successes of the role should be shared with other DHBs experiencing the same issues.

Content references:

- Cohen, L., Greer, N., Berlinger, E., & Sprigle, S. (2013). mobilityRERC state of the science conference: Considerations for developing an evidence base for wheeled mobility and seating service delivery. Disability & Rehabilitation: Assistive Technology 8(6), 462-471.
- Greer, N. , Brasure, M. , Wilt, T.J. (2012). Annals of internal medicine:

Rockville (MD): Agency for Healthcare Research and Quality (US);
Wheeled Mobility (Wheelchair) Service Delivery scope of the evidence
- Owens, J., Davis, D.D. (2020). Stat Pearls Publishing LLC
Seating And Wheelchair Evaluation

Presenter biography:

Antjedine Borchers, New Zealand, HBDHB
Antjedine graduated as an Occupational Therapist in 1992 from a German OT School. She currently works for the Hawkes Bay DHB. She has a strong interest in wheelchair and seating provision / 24 hour postural care as well as relationship centred practice. She worked in Paediatrics for most of her career before taking up a position as Advanced Practitioner in wheelchair and seating for the Hawkes Bay DHB.

B8: Strengthening the Growth of Sustainable Wheelchair Provision Communities of Practice: The Bigger Picture

Dr. Rosie Gowran[1,2,3], Dr. Nathan Bray[4], Dr Paula Rushton[5], Dr Mary Goldberg[6], Dr Marie Barhouche Abou Saab[7,3]
[1]University of Limerick, Limerick, Ireland. [2]Assisting Living and Learning (ALL) institute Maynooth University, Kildare, Ireland. [3]International Society of Wheelchair Professionals, Pittsburgh, USA. [4]Bangor University, Bangor, United Kingdom. [5]Université de Montréal, Montréal, Canada. [6]University of Pittsburgh, Pittsburgh, USA. [7]SESOBEL, Lebanon, Lebanon
Dr. Rosie Gowran, Course Director, Lecturer MSc Occupational Therapy (Professional Qualification)
Dr. Nathan Bray, Lecturer Healthcare Improvement
Dr Paula Rushton, Associate Professor Occupational Therapy
Dr Mary Goldberg, Associate Professor
Dr Marie Barhouche Abou Saab, Physiotherapist, Head of Technical Aids Unit at SESOBEL
David Constantine, United Kingdom, Motivation International
Ritu Ghosh, India, Mobility India
Jon Pearlman, United States, University of Pittsburgh

Learning objectives

Upon completion of the session, participants will be able to:

1. Describe the five key positions to address the challenges when accessing appropriate wheelchairs.
2. Reflect on wheelchair provision within their own context, considering challenges and solutions for sustainable development.
3. Identify and prioritize ways to take positive action to strengthen the growth of sustainable wheelchair provision communities of practice

Abstract

Introduction: The World Health Organization's primary role is to direct and lead global health responses with international partners within the United Nations' system. On 28th May 2018 the World Health Assembly passed a resolution to improve access to assistive technology for all, in line with the CRPD, Sustainable Development Goals, and the call for action by the WHO Global Co-operation on Assistive Technology (GATE). The provision of wheelchair and seating assistive technology are among the key priority assistive products and WHO have committed to developing global standards for wheelchair provision to meet this primary personal mobility need as a basic human right. However, providing appropriate wheelchairs is complex to meet individual requirements to enhance fundamental freedoms and equal opportunity. Many governments have not committed to national wheelchair provision policy globally. To create a sustainable and seamless wheelchair service delivery system which is woven into the fabric of each community requires careful consideration and planning.

Approach: Lead international contributors to discussions, research and actions towards sustainable wheelchair provision development collaborated to explore the global challenges to accessing appropriate wheelchairs from a sustainable human security perspective, supported with scientific and grey literature from 2008 to 2021, and in-country case study examples.

Findings: Five key positions emerged, *I: Consideration of key perspectives of wheelchair provision across the life course is essential*, II: *Comprehensive wheelchair service delivery processes and a competent workforce are essential, III: Evaluations on wheelchair product quality development, performance and procurement standards* are key, *IV: Understanding the economic landscape when providing wheelchairs is*

critical. V*: Establishing wheelchair provision policy* is a key priority globally.

Conclusion: This paper will present each position, its purpose and discuss ways, how together; we as can take positive action to strengthen the growth of sustainable wheelchair provision communities of practice globally.

Content references:

1) Gowran RJ, Bray N, Goldberg M, Rushton P, Barhouche Abou Saab M, Constantine D, Ghosh R, Pearlman J. Understanding the Global Challenges to Accessing Appropriate Wheelchairs: Position Paper. *International Journal of Environmental Research and Public Health*. 2021; 18(7):3338. https://doi.org/10.3390/ijerph18073338
2) Gowran, R. J.; Clifford, A.; Gallagher, A.; McKee, J.; O'Regan, B.; McKay, E. A., Wheelchair and seating assistive technology provision: a gateway to freedom. *Disabil. Rehabil.* **2020**, 1-12.
3) Burrola-Mendez, Y.; Goldberg, M.; Gartz, R.; Pearlman, J., Development of a Hybrid Course on Wheelchair Service Provision for clinicians in international contexts. *PLoS ONE* **2018,** *13* (6), e0199251.
4) Toro, M. L.; Bird, E.; Oyster, M.; Worobey, L.; Lain, M.; Bucior, S.; Cooper, R. A.; Pearlman, J., Development of a wheelchair maintenance training programme and questionnaire for clinicians and wheelchair users. *Disabil. Rehabil. Assistive Technol.* **2017,** *12* (8), 843-851.
5) Bray N, Kolehmainen N, McAnuff J, Tanner L, Tuersley L, Beyer F, *et al.* Powered mobility interventions for very young children with mobility limitations to aid participation and positive development: the EMPoWER evidence synthesis. *Health Technol Assess* 2020;24(50)
6) World Health Organisation. Assistive Product Specifications and How to Use Them. 2021. Available online: https://apps.who.int/iris/bitstream/handle/10665/339851/9789240020283-eng.pdf (accessed on 5 March 2021).
7) I was unable to add these authors, please add thank you:
8) David Constantine, Constantine@motivation.org.uk, United Kingdom, Motivation International
9) Ritu Ghosh ritugm@mobility-india.org , India, Mobility India
10) Jon Pearlman, jpearlman@pitt.edu, United States, University of Pittsburgh

Presenter biography

Rosie Gowran, Course Director of MSc Occupational Therapy (Professional Qualification) and Post-Graduate Certificate in Posture Seating and Wheelchair Mobility Across the Life Course, University of Limerick. Occupational Therapist and human rights activist, Rosie's PhD focused on Sustainable Wheelchair Provision. Rosie adopts a human security approach to support people with disabilities, particularly people who use wheelchairs, to address service system challenges and erosion of personhood. Building sustainable communities of practice in health and social care is the overarching theme that drives Rosie's research and education philosophy to advocate for appropriate person-centered service provision as a responsibility of the whole community. She uses participatory, stakeholder-centered inclusive mixed methodologies, towards collective development of sustainable policy, implementation and provision of appropriate wheelchair services to meet peoples' needs across the life course. A member of International Society of Wheelchair Professionals (ISWP), Rosie is a nominated member of the Wheelchair Educator Package (WEP) development team (2020-2022)

C8: Analysing the cost of failing to include everyone in society with universal design.

Mr Tim Young
Smart Access Ltd, Hamilton, New Zealand
Director

Learning objectives

1. To raise the awareness of the importance of robust data collection of accessibility features in infrastructure, and of the travel patterns of people with disabilities.
2. To explain to participants some of the accessibility features that we collect that they may have not thought about as being important.
3. To encourage participants to ask their organisation or local government to collect such data.
4. At the end of the session participants will be able to identify a range of accessibility features in infrastructure and explain to others why this type of data collection is important.

Abstract

Currently, there is no used method (or desire) for local and central governments to conduct a cost-effectiveness analysis of implementing universal design (UD) and failing to implement UD in infrastructure and public transport. There is a lack of data collected to provide economists and governments information about where infrastructure accessibility features are present, and a lack of data about where disabled people travel. Without this data no further economic insights can be made.

Smart Access provides comprehensive accessibility audits collecting GPS location data, photos of the accessibility features, and a timestamp.

The information is easy to see in the Smart Access application. It allows users to plan a safe journey before leaving their house, no matter what their ability levels is.

Unlike past audits that have only collected data on four accessibility features and have not been easily accessible to the general public, we are collecting detailed data on 35 different variables identified through extensive consultation with the disabled community, with all information easy and free for the public to access with the Smart Access application.

Users can choose to see only the accessibility features that affect their travel, so they can effectively plan the best travel route that meets their specific needs. This information allows Council staff to prioritise infrastructure upgrades with extensive data, to improve on your evidence-based approach.

Content references:

Project Sidewalk out of the University of Washington is the next closest research to use machine learning to automatically detecting accessibility features but is limited to 4 accessibility features and is not very accurate. Saha et al. (2017) developed Project Sidewalk, which uses 'citizen researchers' or crowdsourcing to allow people online to virtually research and assess physical accessibility for manual wheelchair users.

De Jonge and Schraner (2010) have the most advanced method to assess the cost of not providing assistive technology (AT) or universal design to develop an inclusive society. The researchers aimed to measure the effectiveness of assistive technology (AT) and universal design (UD) while also developing a cost-effectiveness analysis that can take into account the many variables within a complex conceptualisation of effectiveness.

To do this, de Jonge and Schraner (2010) decided to use the World Health Organisation's (WHO) framework called the International Classification of Functioning, Disability and Health (ICF). They followed the

classification of activities and participation to identify effectiveness and the classification of environmental factors to identify the relevant costs.

Other than the ICF, models to assess accessibility in infrastructure include the Pedestrian Planning Guide, Universal Design Principles and the Guide to Road Design.

Research on this topic seems to be quite limited which is why I'm completing my PhD in Environmental Planning this year to expand the knowledge in this area.

Presenter biography

Tim Young has a background in educational psychology, research, and app development. He is now a research assistant with the Burwood Academy of Independent Living, and a consultant to central and local governments on accessibility issues.

Tim also focuses on using technology to solve accessibility issues after facing many accessibility issues in his own experiences as a tetraplegic. He has a business, Smart Access, which collects and sells data on 33 accessibility variables to local governments to help better prioritise infrastructure spending. Smart Access also provides this data to the public with an app. A town/city-wide accessibility audit gives Councils the information they need to link transport routes to key amenities with universal design, so all of the public can access public facilities.

C9: Finite element analysis for assessment of tissue-deformation on the buttocks in the context of PI

Carlos Kramer
Vicair, Wormer, Netherlands
International Educator

Learning objectives

1. Upon completion of this session, attendees will be able to understand finite element modeling.
2. Upon completion of this session, attendees will be able to understand how to use finite element modeling to do analysis.
3. Upon completion of this session, attendees will be able to understand that finite element modeling is a valid model to do analysis.

Abstract

A pressure injury (PU) is defined in the international guidelines as localized damage to the skin and/or underlying tissue as a result of pressure or pressure in combination with shear. Tissue damage that characterizes pressure injuries occurs as a result of intense and/or prolonged exposure to sustained deformations in compression, tension or shear, or a combination of these loading modes.

At the basis of finite element modeling (FEM) lies the development of a representative model of how a real-life object is going to behave when it is met with a specific boundary condition (i.e. pressure applied to the buttocks). MRI tissue deformation data serve as boundary constraints to solve the FEM for the imaged tissues.

Techniques available for assessment of internal deformation are magnetic resonance imaging (MRI), elastography, and ultrasound. These imaging techniques can be used in combination with a subject-specific theoretical finite element analysis (FEA) to estimate deformations, strains and stresses throughout the tissue structures. [EPUAP Guidelines, 2019]

Finite element analysis is often used because of its capability of handling complex geometries and modeling the non-linear behavior of tissues. Finite elements are geometrical shapes of a specific size and are found within a domain. The sum of all elements describe the whole continuum (i.e. soft tissue). By calculating the boundary conditions of these finite elements, you can learn about tissue behavior under stresses.

Finite element analysis has become widely used to model human soft tissue behavior and large tissue deformation. Also in the field of pressure injury research.

After introducing FEM/FEA we will share the first results of a comparison between an air based cushion and a foam cushion.

Content references:

1) Guideline, T. I. (2019). *Prevention and Treatment of Pressure Ulcers / Injuries : Clinical Practice Guideline The International Guideline*.
2) Macron, A., Pillet, H., Doridam, J., Rivals, I., Sadeghinia, M. J., Verney, A., Rohan, P., Doridam, J., & Rivals, I. (2019). *Is a simplified Finite Element model of the gluteus region able to capture the mechanical response of the internal soft tissues under compression ? To cite this version : HAL Id : hal-02332239 Is a simplified Finite Element model of the gluteus region abl*.
3) Lee, W., Won, B. H., & Cho, S. W. (2017). Finite element modeling for predicting the contact pressure between a foam mattress and the human body in a supine position. *Computer Methods in Biomechanics and Biomedical Engineering*, *20*(1), 104–117.

https://doi.org/10.1080/10255842.2016.1203421
4) Luboz, V., Petrizelli, M., Bucki, M., Diot, B., Vuillerme, N., & Payan, Y. (2014). Biomechanical modeling to prevent ischial pressure ulcers. *Journal of Biomechanics*, *47*(10), 2231–2236. https://doi.org/10.1016/j.jbiomech.2014.05.004

Presenter biography

Carlos Kramer specialised himself in seating and positioning through gaining practical experience whilst working for long term care centres, rehabilitation centres and rehab vendors. His educational background is in physics and before pursuing his passion in the industry, he spent 7 years teaching in schools on all levels. He expanded his knowledge of seating and positioning through his close relations and now colleagues Sharon Sutherland-Pratt, Bengt Engström and Bart Van der Heijden. Carlos is the head of education at Vicair since 2012 and continues to combine his expertise in teaching and passion for seating to provide high quality education in the field worldwide.

D9: Preliminary report on the development of a novel front wheel attachment for manual wheelchairs

Dr. Jaimie Borisoff[1,2], Prof. James Laskin[3,4]
[1]British Columbia Institute of Technology, Vancouver, Canada. [2]Elevation Products, Vancouver, Canada. [3]University of Montana, Missoula, USA. [4]Praxis Spinal Cord Institute, Vancouver, Canada
Dr. Jaimie Borisoff, Research Director
Prof. James Laskin, Professor

Learning objectives

Upon completion of this session, participants will be able to:

1. Identify 3 wheelchair add-on devices that improve wheeling outdoors
2. Describe the novel features and benefits of a new front wheel attachment for manual wheelchairs
3. Compare and contrast end-user and therapist feedback about the novel device and general issues experienced by users when wheeling outdoors

Abstract

The small front caster wheels of manual wheelchairs are necessary for the stability and maneuverability needed by wheelchair users, especially indoors or on hard level surfaces. Unfortunately, “casters are [also] parasites” [1] and greatly inhibit wheeling on soft or uneven terrains such as grass, trails, or snow [2-4]. The Freewheel® is the best-known front wheel attachment for manual wheelchairs that help solve this problem by lifting the casters off the ground [2]. These add-ons improve wheelchair propulsion [5] by reducing the rolling resistance via a single large diameter front wheel [3]. Unfortunately, these add-ons all suffer from the same problem: they are cumbersome to attach and difficult to carry/store when not employed, and thus cannot transition quickly and simply from outdoor to indoor wheeling; consequently, they are left behind at home far too often. To address these problems, a novel front wheel attachment, named SWIVL™, was developed by following a user-centred design process embedded in the Praxis Spinal Cord Institute technology incubator program [6]. Like its competitors, SWIVL™ is attachable to the wheelchair’s footplate; but uniquely, it is stowable - folded up between the user’s legs or underneath their seat, thus preserving nominal wheelchair performance at all times when not required. When desired, SWIVL™ is deployed in seconds by reaching down and “swiveling” it out till it touches the ground. Then with a small “pop” or wheelie it snaps into place and lifts the casters off the ground. When not needed it can be quickly returned to its stowed position. Therefore, individuals can easily shift between using SWIVL™ when outdoors and regular castors when indoors. End-user feedback, collected at several stages of the device’s development, will be presented. We hope that devices such as SWIVL™ can promote greater participation outdoors and contribute to the individual’s autonomy.

Content references:

1) Denison I. The art of wheelchair setup. The 13th International Seating Symposium; Pittsburgh, PA. 2000.
2) Denison I and JF Borisoff. Initial Evaluation of the FreeWheel™ Wheelchair Attachment. Rehabilitation Engineering and Assistive Technology Society of North America. Toronto, ON. June 2011.
3) Chan FHN, M Eshraghi, MA Alhazmi, BJ Sawatzky. The effect of caster types on global rolling resistance in manual wheelchairs on indoor and outdoor surfaces. Assistive Technology. 30(4):176-182. 2018.
4) Berthelette M, DD Mann, J Ripat, C M Glazebrook. Assessing manual wheelchair caster design for mobility in winter conditions. Assistive Technology. 32: 31-37. 2020.
5) Choukou M-A, KL Best, M Potvin-Gilbert, F Routhier, J Lettre, S

Gamache, J Borisoff, DH Gagnon. Scoping Review of Propelling Aids for Manual Wheelchairs. Assistive Technology. 28:1-15. 2019.
6) In conversation with Praxis SCI Incubate cohort member Elevation Products. https://praxisinstitute.org/in-conversation-with-jaimie-borisoff-elevation/

Presenter biography

Dr. Borisoff is the Canada Research Chair in Rehabilitation Engineering Design at the British Columbia Institute of Technology, an Adjunct Professor at the University of BC Department of Occupational Science & Occupational Therapy, and a Principal Investigator at ICORD (International Collaboration on Repair Discoveries). His lab performs rehabilitation engineering research and development about various assistive and therapeutic technologies for people with disabilities. Projects include the development of “dynamic” wheeled mobility devices that allow users to quickly change their wheelchair configuration on-the-fly to suit different daily activities, such as the Elevation™ ultralight wheelchair by PDG Mobility, and most recently the SWIVL™ “Stow & Roll Front Wheel™” that instantly switches a manual wheelchair into outdoor mode (with low rolling resistance) whenever you need it and quickly retracts again for full indoor maneuverability.

D10: The effectiveness of clinical, therapeutic seating after the Covid-19 pandemic for long term care patients.

Martin Cominetto
Seating Matters, Belfast, Ireland
Clinical Director, Occupational Therapist

Learning objectives

Delegates will learn to identify and understand the:

1. Impact that poor sitting posture has upon the long term care patients and their caregivers
2. Contribution of specialized seating in reducing pressure injuries
3. Effects of Covid-19 for the long term care patient as a result of prolonged isolation and 'lockdown' measures.

Abstract

As the immediate effects of Covid-19 became increasingly apparent, we are only now beginning to understand the possible long term effects on patients physical ability, function and wellbeing, as a result of prolonged isolation and 'lockdown' measures. This presentation explores the possible challenges that patients may face as a result of covid-19 and the results of a previous clinical trial examining the effectiveness of individualised seating assessment within long term care facilities and how it can significantly impact the health and wellbeing of patients and caregivers.

This study demonstrates that specialized seating can contribute to a reduction in pressure injuries and postural correction, increased saturated oxygen levels, functional ability and social interaction.

Prescribed seating may contribute to a reduction in pressure injury incidence and increased functional ability. It highlights that each patient is different, requiring individualized evaluation of seating needs before making recommendations for an appropriate seating system. This research provides evidence based pressure management through therapeutic seating.

The findings from the research are replicated by clinicians worldwide who continue to improve patient care through utilizing therapeutic seating to reduce pressure injuries, encourage early mobilization and reduce caregiver manual handling. Having conducted this ethically approved, clinical research in real life care settings, it makes it manageable for the outcomes to be replicated to improve clinical practice

Content references:

Daly, O., Casey, J., Martin, S., Tierney, M., McVey., O. 2013. The effectiveness of specialist seating provision for nursing home residents. Ulster University: Northern Ireland.

Presenter biography

Martin Cominotto is a senior seating specialist and education director at Seating Matters Australia. Martin started his clinical career as a Pharmacist, specialising in complex chronic disease management in the community. Martin is responsible for all clinical training and education for Seating Matters in Australia and New Zealand, as well as complex seating prescription.

E8: Virtual training: connecting peers to communities through wheelchair skill education.

Dr Krista Best[1,2], Dr. Céline Faure[2], Dr. Ed Giesbrecht[3], Dr. François Routhier[1,2], Dr. William Miller[4]
[1]Université Laval, Quebec City, Canada. [2]Cirris, Quebec City, Canada. [3]University of Manitoba, Winnipeg, Canada. [4]University of British Columbia, Vancouver, Canada
Dr Krista Best, Assistant Professor, Researcher
Dr. Céline Faure, Research Professional
Dr. Ed Giesbrecht, Assistant Professor
Dr. François Routhier, Professor, Researcher
Dr. William Miller, Professor

Learning objectives

At the end of the session, attendees will be able to:

1. Describe potential barriers and facilitators to peer-trainer readiness and intervention fidelity with virtual training.
2. Discuss anticipated trends of peer-led approaches to rehabilitation delivery.
3. Apply the content and structure of material presented to other peer-training interventions.

Abstract

Peer-led wheelchair skills training programs are feasible and promising for improving wheelchair skills, wheelchair use self-efficacy, and satisfaction with participation in meaningful activities.[1-3] Peers are individuals who share the life experience of using a wheelchair for mobility and have received specialized training to support wheelchair skills.[4]Integrating peers in the delivery of wheelchair skills training can enhance the continuum of healthcare delivery from rehabilitation to the community.[1,4]

TEAMWheels is a tablet-based eHealth program combining a wheelchair skills training app and three peer-led training teleconferences on Microsoft Teams.[5] Pre-COVID, peer-trainers received a two-day in-person preparation course. In light of pandemic-related public health recommendations, this course was reconfigured to be delivered virtually.

Our virtual train-the-trainer program is comprised of videos, videoconferencing, and evaluations of trainer readiness and intervention fidelity. Six asynchronous modules provide instruction about the Microsoft Teams and TEAMWheels applications; the goal setting, monitoring and action planning components of the intervention; and the 'trainer's hangout' built-in Microsoft Teams to keep peers connected throughout the study. A series of 1-hour interactive videoconferences with members of the research team provide review, discussion, and integration of module content. Each session allows the peer trainer to demonstrate their capacity to conduct items from the trainer readiness checklist. Fidelity of the virtual train-the-trainer program is documented during training and will be followed through TEAMWheels application activity.

Five peer-trainers have completed the training program to date. This instructional course will discuss the development of the modules and their current implementation. Considerations for trainer readiness and intervention fidelity will be discussed in reference to the TEAMWheels project, with discussion on how modules may be applied in other areas of rehabilitation. Development of a virtual train-the-trainer wheelchair education program demonstrates **Whanaungatanga,** as it facilitates ***connecting people and communities***.

Content references:

1) Best KL, Miller WC, Huston G, Routhier F, Eng JJ. Pilot study of a peer-led wheelchair training program to improve self-efficacy using a manual wheelchair: A randomized

controlled trial. Arch Phys Med Rehabil. 2016;97(1):37–44.
2) Best KL, Miller WC, Huston G, Routhier F, Eng JJ. Pilot Study of a Peer-Led Wheelchair Training Program to Improve Self-Efficacy Using a Manual Wheelchair: A Randomized Controlled Trial. Arch Phys Med Rehabil. 2017;97(1):37–44.
3) Miller WC, Best KL, Eng JJ, Routhier F. Influence of peer-led wheelchair training on wheelchair skills and participation in older adults: Clinical outcomes of a randomized controlled feasibility trial. Arch Phys Med Rehabil. 2019 Jun;100(6):1023-1031.
4) Divanoglou A, Tasiemski T, Augutis M, Trok K. Active Rehabilitation - a community peer-based approach for persons with spinal cord injury: International utilisation of key elements. Spinal Cord. 2017; Jun;55(6):545-552. doi: 10.1038/sc.2017.28

Presenter biography

Dr. Krista Best is an Assistant Professor in the Faculty of Medicine at Université Laval and a Quebec Health Research Foundation Junior 1 Scholar at the Centre for interdisciplinary research in rehabilitation and social integration (Cirris) in Quebec, Canada. Dr. Best has expertise in developing and evaluating community-based wheelchair skills training programs for manual and power wheelchairs, including clinician-led, peer-led and mHealth approaches to training. While most of her research has focused on adults, she has recently begun to investigate best practices in children and youth. A member of the Wheelchair Skills Program editorial committee since 2001, Dr. Best continues to inform the evolution of the Wheelchair Skills Program. She is on the Board of Directors for the Canadian National Society of Prosthetics and Orthotics and Associate Editor for the Assistive Technology Journal.

Dr. Ed Giesbrecht began working as an occupational therapist in 1994, developing a particular interest in assistive technology and wheeled mobility, serving as clinical specialist in an Assistive Technology clinic in Winnipeg, Canada. His research interest drew him to academia to pursue a master's and PhD degree. He is an Associate Professor in the department of Occupational Therapy at the University of Manitoba. His research focuses on strategies to address wheelchair mobility skills and training, improving entry-to-practice education, and winter mobility.

Céline Faure, PhD, OT, is a research professional at the Centre for Interdisciplinary Research in Rehabilitation and Social Integration in Quebec, Canada. She has a high interest in the development of new technologies to improve rehabilitation and the community reintegration of persons with functional motor limitations. She has expertise in virtual reality and is involved in several research projects to develop training such as eHealth peer-led wheelchair skills training program and exoskeleton gait training combined with functional electrical stimulation.

A10: Where is the Pelvis? Where is the Head? An advanced look at postural support.

Jean Minkel
Senior Vice President for Rehab and Mobility Services
Independence Care System, Brooklyn, NY, USA

Learning objectives

By attending this workshop participants will be able to:

1. Define at least 3 different positions of the pelvis that a person may assume while sitting up against gravity.
2. Relate the position of the pelvis to the most common resulting spine/trunk position
3. Identify the position of the head, depending on the position of the pelvis and the trunk

Abstract

The workshop will move from the findings of a mat / supine assessment to using those findings to determine a person's personal posture in the seated position. There will be an emphasis on the effect of gravity when a person sits up and gravity pushes down. We will explore how postural supports can be positioned to provide external support and improve head control. Finally, different pelvic positions will be presented to demonstrate the impact of pelvic positioning on the management of interface pressure while sitting.

Content references:

1) Minkel, J. "Seating and Mobility Evaluations for Persons with Long-Term Disabilities" in Lange, M. and Minkel, J (2018) *Seating and Wheeled Mobility: A clinical Resource Guide.* Slack, Inc.
2) Sonenblum, Sharon E, Stephen H Sprigle, and James S Martin. "Everyday Sitting Behavior of Full-Time Wheelchair Users." Journal of rehabilitation research and development 53.5 (2016): 585–598. Web.
3) Hillman, Susan J, and James Hollington. "A Quantitative Measurement Method for Comparison of Seated Postures." *Medical engineering & physics* 38.5 (2016): 485–489. Web.

Presenter biography

Ms. Minkel is a physical therapist and master clinician well recognized for her work in Assistive Technology. She is currently the Senior Vice President for Rehab and Mobility Services for ICS - Independence Care System, a not for profit, care management agency for persons living with a physical disability in New York City. Jean is also an independent consultant who provides educational and consulting service to all members of the A.T. team.

Jean has been an invited keynote speaker at conferences in the US, Canada, Australia, New Zealand and Japan. She is a published author, including many peer reviewed journal articles and most recently, she co-edited, with Michelle Lange, the newly published textbook, Seating and Wheeled Mobility – a Clinical Resource Guide. The A.T. community has recognized Jean for her contributions by awarding to her, the RESNA Fellow award in 1995 and the Sam McFarland Mentor Award in 2012.

B9: From idea to innovation - a practical session on problem solving, design, disability and innovation. (2hr INTERACTIVE SESSION)

Dr Tim Adlam

Everyone is a designer – we all solve problems and invent solutions. It's what humans do - together. Design is a collaborative activity where no one person has all the answers. This workshop will build on the plenary talk and practically explore how to solve problems and design solutions. We will explore how design thinking can be applied to problems in different contexts and do some designing together in small groups.

Learning objectives

Attendees should be able to:

1. Describe three approaches to design that are relevant to designing for people with disabilities
2. Apply design thinking to solving an everyday problem
3. Evaluate the success of a design

Some relevant and interesting references:

1) Orpwood, Roger. (2009). "Design methodology for aids for the disabled". Journal of medical engineering & technology. 14. 2-10. 10.3109/03091909009028756. http://dx.doi.org/10.3109/03091909009028756
2) Pullin, Graham. (2011). "Design Meets Disability", MIT Press, ISBN 9780262516747, https://mitpress.mit.edu/books/design-meets-disability
3) Holloway, C., 2019. "Disability interaction (DIX) a manifesto". Interactions, 26(2), pp.44-49. http://dx.doi.org/10.1145/3310322
4) Bound K, Thornton I. (2012). "Our frugal future: lessons from India's innovation system". NESTA. ISBN 978-1-84875-138-5 https://media.nesta.org.uk/documents/our_frugal_future.pdf

Presenter biography

Dr Tim Adlam is an Associate Professor of Global Disability Innovation at UCL Global Disability Innovation Hub in London, and director of the multidisciplinary MSc in Disability, Design and Innovation. For over 20 years, Tim has worked to create technology to enable disabled people to do what they want to do, working across physical and cognitive disability, including early powered mobility and dynamic seating for children with dystonia. He advocates a thoroughly engaged approach that solves problems that matter to disabled people with beautiful, useful and usable technology. Children are born curious so it is important that we enable all children to do what they love to do: to explore and discover the unknown in the world and in themselves. To do this, they need to move. Tim is father of a child with autism and cerebral palsy who has taught him never to make assumptions about what is possible.

C10: Kick the Tires! Evaluating Wheeled Mobility Devices for Performance & Safety

Ms. Kendra Betz
University of Pittsburgh, Denver, USA
Physical Therapist

Learning objectives

Upon completion of the session, participants will be able to:

1. Review three critical considerations for evaluating new and emerging wheeled mobility devices
2. Discuss two reasons that objective results from standardized test protocols provide meaningful information about mobility device performance.
3. Describe three common wheeled mobility device failure modes that result in challenges for wheelchair users.

Abstract

Mobility technologies that support increased mobility and participation for individuals with physical impairment are consistently developed and introduced to the rehabilitation community. Product innovations capture a wide realm of proposed mobility solutions, ranging from unique ambulation assistive devices to highly customizable wheeled mobility options and rapidly evolving powered exoskeletons that support individuals who are paralyzed to stand and walk. Within each mobility device category, extensive variability exists. As just one example, manual wheelchairs are available with a multitude of frame designs and features, are built with diverse materials, and are highly customizable by configuration, individualized selection of options and accessories, and interface with complementary mobility enhancing products such as power add-on systems. Often, limited objective evidence is available about the appropriate use and effectiveness of a new mobility device, yet rehabilitation professionals must respond to consumers who believe it is a "must have," to product representatives who promote it as the "greatest invention ever" and to funding sources who insist it is an "unnecessary expense". Many people are challenged to strategically analyze mobility products to differentiate between beneficial attributes and limits of use based on the information available.

The aim of this session is to empower participants to evaluate existing, new, and emerging mobility technologies to support an accurate and meaningful assessment of potential value and identified limitations. Topics will include regulatory requirements, established international test standards, impact of published literature, ethical considerations, objective and hands-on review of device performance, durability, and safety. Strategies to identify specific clinical indications and contraindications for various mobility options will be discussed and the impact of mobility device failure on consumers will be explored. Participants will develop a framework for objectively evaluating devices to support practical clinical recommendations to support clients with unique mobility needs.

Content references:

1) Mhatre A, Martin D, McCambridge M, Reese N, Sullivan M, Schoendorfer D, Wunderlich E, Ruchman C, Mahilo D, Pearlman J. Developing product quality standards for wheelchairs used in less-resourced environments. *African J of Disability*. 2017.

2) Kirby RL, Miller WC, Routhier F, Demers L, Mihailidis A, Polgar JM, Rushton PW, Titus L, Smith C, McAllister M, Theriault C, Thompson K, Sawatzky B. Effectiveness of a Wheelchairs Skills Training Program for Powered Wheelchair Users: A randomized controlled trial. *Arch Phys Med Rehabil*. 2015; 96 (11): 2017-26.

3) Hogaboom NS, Worobey LA, Houlihan B, Heinemann A, Boninger M. Wheelchair breakdowns are associated with pain, pressure injuries, rehospitalization, and self-perceived health in full-time wheelchair users with spinal cord injury. *Arch of Phys Med Rehabil*. 2018 Oct;99(10): 1949-1956.

4) Betz K, Dicianno B, Pearlman J, Karg T, Mandala M, Jacobs K, Bagian T. Clinical Limits of Use Tools (CLOUT) for Wheeled Mobility Devices. February 2018. www.ncps.va.gov/professionals/publications/CLOUT.asp

Presenter biography

Kendra Betz is a Physical Therapist and RESNA Assistive Technology Professional who is speaking at OSS as adjunct faculty for the University of Pittsburgh. She has also worked for the Veterans Health Administration in the USA since 1993. Kendra's areas of clinical specialization include SCI rehabilitation, assistive technology, adaptive sports, and patient safety. Kendra teaches regularly at national and international forums, leads national projects for medical device evaluation and has developed innovative programs to provide specialized support for adaptive athletes. Her expertise is recognized in the USA by induction into the National SCI Association Hall of Fame, the Air Force Association's Employee of the Year Award, and the Clinical Excellence and Distinguished Lecture Awards from the Academy of SCI Professionals.

D11: The pediatric powered wheelchair standing device: a historical perspective

Dr. Lisa K. Kenyon[1], Dr. Bonita Sawatzky[2]
[1]Grand Valley State University, Grand Rapids, USA. [2]University of British Columbia, Vancouver, Canada
Dr. Lisa K. Kenyon, Professor

Learning objectives

At the completion of the session, attendees will be able to:

1. Explain 3 ways in which powered wheelchair standing devices have evolved over the past 40 years.
2. List 3 potential factors that have affected of powered wheelchair standing device development for children
3. Discuss 3 societal changes that have enhanced our ability to provide powered wheelchair standing devices to children
4. Compare and contrast various pediatric PWSDs from around the world

Abstract

Idioms such as ‘stand up for yourself’, ‘as sure as I am standing here’, and ‘stand your ground’ reinforce standing as a societal norm symbolizing independence, dignity, and autonomy. For children who use a powered wheelchair, a powered wheelchair standing device (PWSD) may offer more than just opportunities for lower extremity weight bearing. This session will explore pediatric PWSDs through the lens of a historical perspective. We’ll start in the 1970s with the development of the first standing wheelchair devices/PWSDs for adults and examine the evidence-based value and benefits of these early devices. We will then shift our focus to the evolution of pediatric PWSDs and track changes in pediatric PWSDs to society's changing values and beliefs over time regarding adults and children with disabilities. We’ll then explore potential factors influencing pediatric PWSD design and use. Finally, we will compare and contrast various pediatric PWSDs from around the world.

Content references:

1) Townsend EL, Bibeau C, Holmes TM. Supported standing in boys with Duchenne muscular dystrophy. *Pediatr Phys Ther*. 2016;28(3):320-329.
2) Tally MK, Pope EM. We're still standing. *Rehab Manag*. 2020:33:6-9.
3) Vorster N, Evans K, Murphy N, KavaM, et al. Powered standing wheelchairs promote independence, health and community involvement in adolescents with Duchenne muscular dystrophy. *Neuromuscul Disord*. 2019; 29(3):221-230.
4) Bayley K, Parkinson S, Jacoby P, et al. Benefits of powered standing wheelchair devices for adolescents with Duchenne muscular dystrophy in the first year of use. *J Paediatr Child Health*. 2020;56(9):1419-1425.
5) Schofield C, Evans K, Young H, et al. The development of a consensus statement for the prescription of powered wheelchair standing devices in Duchenne muscular dystrophy. *Disabil Rehabil*. In press. Available in advanced on-line as of 02 September 2020 at:https://doi.org/10.1080/09638288.2020.1810786.
6) Kenyon LK, Harrison KL, Huettner MK, Johnson SB, Miller WC. “Stand-on-demand’: a qualitative study exploring stakeholder perspectives of pediatric powered wheelchair standing devices. *Dev Med Child Neurol*. In press. Available in advance on-line as of 19 February 2021 at: https://onlinelibrary-wiley-com.ezproxy.gvsu.edu/doi/epdf/10.1111/dmcn.14842.

Presenter biography

Lisa Kenyon is a Professor in the Department of Physical Therapy at Grand Valley State University in Grand Rapids, Michigan. Dr. Kenyon heads the Grand Valley Power Mobility Project, an inter-professional research and service project that provides power mobility training for infants, toddlers, children and young adults who are not typically considered to be candidates for power mobility use. Dr. Kenyon presents nationally and internationally on topics related to pediatric physical therapist practice and has published multiple peer-reviewed journal articles and book chapters pertaining to power mobility and pediatric topics. Dr. Kenyon currently serves on the Editorial Committee for the Wheelchair Skills Program (Dalhousie University, Halifax, Nova Scotia, Canada) and on the Pediatric Specialty Council of the American Board of Physical Therapy Specialties.

Bonita Sawatzky is an Associate Professor in the Department of Orthopaedics at the University of British Columbia. Dr. Sawatzky has worked extensively with people with spinal cord injury, including traumatic and non-traumatic populations, as well as adults and children. The focus of her research has been to find ways to make mobility easier and more efficient for those with spinal cord injuries with over 80 peer reviewed publications. She aims to develop a better understanding of the biomechanics of mobility and identifying ways to educate individuals on how to walk or wheel more effectively. In addition, Dr. Sawatzky has begun to explore more specifically issues related with ageing such as technologies and training for older populations, as well as understand functional changes with ageing of individuals with rare neuro/orthopaedic conditions. She worked with the Vancouver ISS committee for 18 years and now enjoying working with the OSS organizing committee!

E9: A Pilot Study Comparing Postural and Functional Skills in Supportive vs. Unsupportive Wheelchair Backs

Dr. Jessica Pedersen[1,2], Dr. Cynthia Smith[3]
[1]Shirley Ryan AbilityLab, Chicago, USA.
[2]Devices 4 the Disabled, Chicago, USA.
[3]Private Practice, Denver, USA
Dr. Jessica Pedersen, Clinical Director/Research Assistant
Dr. Cynthia Smith, owner

Learning objectives

1. Identify two outcome measures for determining the benefits of a back support
2. Describe a method for measuring a a kyphosis when sitting in a wheelchair
3. Identify evidence demonstrating differences in forward upward reach when using two different backs

Abstract

Does a back support make a difference for people with a C6-T4 SCI? The intervention of back supports for people with spinal cord injury began in the 1980s. Since that time, many products were introduced to provide posterior support at the pelvic and sacral area in an effort to neutralize pelvic tilt and promote a more upright spine. Does a back support, placed in an optimal position to prevent a posterior pelvic tilt, make a significant difference compared to no back support? What outcomes make a statistical significance? This study looked at the ability to maintain spinal alignment, spirometry outcomes, reach, pain, and wheelchair skills with a person using a K5 wheelchair with and without a back support. This presentation will demonstrate how a clinician can practically gather evidence in the clinic to demonstrate any physical or functional changes with a back support intervention. This data can help in clinical decision making as well as provide data to support reimbursement to third party payers questioning the expense. Participants will learn the process for incorporating research into a clinical setting including determining the research question, developing a PICO, determining appropriate outcome measures, collecting and analyzing the data. The measures will be demonstrated, illustrating how they can be incorporated during a a clinical session. Outcomes will be outlined with analysis determining significance to show how a supportive back can enhance function versus a back that does not support the pelvis and spine into a neutral position.

Content references:

1) Presperin Pedersen J, Smith C, Dahlin M, Jones J, McKenzie K, Sevigny M, Yingling L. Wheelchair backs that support the spinal curves: Assessing postural and functional changes. *Journal of Spinal Cord Medicine*, 2020.online publication, doi: 10.1080/10790268.2020.1760530https://doi.org/10.1080/10790268.2020.1760530
2) Presperin Pedersen J, Smith C, Dahlin M, Henry M, Jones J, McKenzie K, Roussel H, Yingling L. Wheelchair backs that support spinal curves: Assessing postural and functional changes. 10/2019100(10);e144-e145.
3) Smith C., Presperin Pedersen J, Henry M, McKenzie K, Yingling L, Roussel H, Dahlin M, Jones J. Proving what we know: Clinical evidence of spinal curve support. In *Proceeding of the 35th International Seating Symposium: Bridging the Gap from Data to Value*, March 20-22, 2019 Pittsburgh, PA University of Pittsburgh
4) May LA, Butt C, Kolbinson K, Minor R, Tulloch K. Wheelchair back support options: Functional outcomes for persons with spinal cord injury. *Arch Phys Med and Rehab* 2004;85:1146-50. doi: 10.1016/j.apmr.2003.08.105.
5) Medola F, Elui V, Santana CD, Fortulan CA. Aspects of manual wheelchair configuration affecting mobility: A review. *J Phys Ther Sci* 2014 Feb;26.2:

313-318. doi:10.1589/jpts.26.313.
Cited in PMID: 24648656

Presenter biography

Jessica and Cindy have over 80 years of experience combined. Each worked in a large rehab center in the United States, Shirley Ryan Abilitylab and Craig Rehabilitation Hospital. They have had the opportunity to provide clinical wheelchair and seating service delivery, manage a wheelchair and seating clinic, teach and mentor students and young therapist, advocate for legislative and policy change, and conduct research. They have shared their passion for wheelchairs and seating around the world. They are excited to join together to share these findings.

A11: C1 South Gold Sponsor Session:

Facing Forward – What's Up with Head and Neck Supports

Stephanie Tanguay OT/L, ATP

Abstract

Many consumers who utilise wheeled mobility require a head support as part of their seating system. A headrest may be utilised as a support for periods of rest or in alternative positions such as tilted or reclined. It can also be an integral part of a power wheelchair with aspects of the drive controls embedded in or attached to the head support. This session will review the geometry of the human skull and its' range of movement and the influence of seated posture on head orientation. The impact of these factors on head support will be presented along with an overview of various products.

Presenter biography

Stephanie Tanguay worked as an occupational therapist for 13 years, with a focus on spinal cord injury, seating, and mobility. She also worked as a rehabilitation technology supplier for seven years. She has presented on numerous occasions at the International Seating Symposium, RESNA, the Canadian Seating & Mobility Conference, and the European Seating Symposium. Stephanie has been the clinical education specialist for Motion Concepts since 2006. Stephanie is a native Detroiter and a devoted hockey fan (let's Go Red Wings). She has a vast knowledge & experience of seating and wheeled mobility, when she is not teaching, she is most likely to be found beach combing or visiting a National Park.

D12: Complex Wheelchair Seating and Positioning: The Postural Assessment Process!

Joana Santiago
Medifab, Sydney, Australia, Clinical Education

Learning objectives

Upon completion of this session, participants will be able to:

1. List three essential steps when performing a MAT assessment.
2. Identify at least two common postural deviations observed in each plane of motion
3. Describe the appropriate steps in assessing available hip and knee flexion for a seated position.
4. Describe where postural support is required in a wheelchair seating system based on the MAT assessment findings.

Abstract

Prescribing complex wheelchair seating can be dauting. There are thousands of different solutions to choose from! How can we determine what is the best for our clients, particularly the ones with challenging postural needs? How can we assure the prescribed solution will achieve successful outcomes? Well, the basis for any seating and mobility intervention should be, first and foremost, about the person and their body. We will increase the odds of choosing the right product if we, in fact, perform a comprehensive postural assessment to identify the cause of the postural deviation.

During this interactive session, Joana will facilitate the learning process by breaking down the Assessment Process in small steps, and together with Hammie®, will demonstrate the impact that client's range of motion, joint flexibility, muscle length and skeletal presentation observed on the plinth have on wheelchair seating angles and postural support requirements.

Content references:

1) Ágústsson A., Sveinsson Þ., Rodby-Bousquet E. (2017). The effect of asymmetrical limited hip flexion on seating posture, scoliosis and windswept hip distortion. *Research in Develop. Disabilities*, 71: 18-23.
2) Bach, J. & Waugh, K. (2016). Using Biomechanical Principles in the Management of Complex Postural Deviations in Sitting. Proceedings of the 32nd International Seating Symposium, Vancouver, B.C.
3) Isaacson, M. (2011). Best practices by occupational and physical therapists performing seating and mobility evaluations. *Assistive Technology, 23,* 13 – 21.
4) Kittelson-Aldred T, Sammie WT. (2019). Multi-Joint Muscle Action on the Pelvis. Rehab Management. September.
5) Sparacio, J. (2015). The simplicity of complex seating. *NRRTS*, Vol1.
6) Waugh, K, and Crane, B. (2013). A clinical application guide to standardized wheelchair seating measures of the body and seating support surfaces (rev. Ed.). Denver, CO. University of Colorado Denver.
7) Waugh, K, and Crane, B. (2013). Glossary of wheelchair terms and definitions. Denver, CO. University of Colorado Denver.
8) Spinal Seating Professional Development Program. NSW State Spinal Cord Injury Service. www.aci.health.nsw.gov.au/networks/spinal-cord-injury/spinal-seating

Presenter biography

Joana Santiago is the Clinical Educator Manager and the R&D Clinical Lead for Medifab. She completed her degree in Occupational Therapy in Portugal and soon developed a passion for Posture Care and

Wheelchair Seating & Positioning. With 15 years of experience, predominantly dealing with clients with complex postural needs, Joana takes pride in her flexible capability in reaching good clinical outcomes by considering the individual needs, wants and expectations of those she works with. Joana is based in Australia where she primarily assists clinicians by sharing her knowledge and expertise through education and mentoring programs. Furthermore, she has a positive influence on the development, supply, and training of Medifab's extensive range of products.

She is a specialist in her field and has presented at a variety of national and international conferences around the World.

E10: Tales from the field: Using fully customised seating products

Ms Jenni Dabelstein
Gizmo Rehabilitation, Brisbane, Australia
Physiotherapist/Complex AT Prescriber

Learning objectives

1. Identify 3 key factors that indicate when bespoke seating products may provide appropriate clinical solutions, in contrast to off-the-shelf solutions.
2. Identify and utilise 3 key strategies for success when prescribing bespoke seating products.
3. Understand processes required to effectively mould and fit bespoke seating products

Abstract

Fully bespoke, custom-moulded wheelchair seating products have long been available, however accessing them has often required repeat travel to a specialist seating clinic. In current times, custom products manufactured from digitised moulds can be easily created from the field, with the client sitting in their own mobility base, in their own home. This ease of moulding and digitising makes bespoke products now easily accessible to clinicians and clients alike.

While bespoke products are now more accessible than ever off-the-shelf products have become increasingly modular, adjustable and customisable, to better meet the needs of clients with atypical posture and anatomy.

So, for which clients should clinicians consider a fully bespoke system instead of a customisable off-the-shelf item? What are the key strategies for success when using bespoke products, and what are the potential pitfalls? What processes are required, to successfully assess, prescribe, mould and fit bespoke seating? In this presentation, I will describe the process for identifying need, highlight assessment requirements and provide insight into the moulding and fitting process. This will be informed by case studies from my own clinical practice, including clients with severe global physical impairment as well as clients using active wheelchairs, including sports applications.

Content references:

1) Crane B, Wininger MA & Call E. (2016) Orthotic-Style Off-Loading Wheelchair Seat Cushion Reduces Interface Pressure Under Ischial Tuberosities and Sacrococcygeal Regions. Archives of Physical Medicine & Rehabilitation, Volume 97, Issue 11, p1872-1879, available from https://www.archives-pmr.org/article/S0003-9993(16)30080-6/fulltext
2) da Silva FP, Beretta EM, Prestes RC, Kindlein JW. Design and milling manufacture of polyurethane custom contoured cushions for wheelchair users. Australas Med J [Internet]. 2011 [cited 2015 Oct 22];4(9):500-6. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3562910 PubMed: PM23393542
3) Angsupaisal M, Maathuis CGB and Hadders-Algra M. Adaptive seating systems in children with severe cerebral palsy across International Classification of Functioning, Disability and Health for Children and Youth version domains: a systematic review. Dev Med Child Neurol 2015; 57: 919–931. Available from: https://onlinelibrary.wiley.com/doi/full/10.1111/dmcn.12762

Presenter biography

Jenni Dabelstein is a Physiotherapist who works exclusively as a prescriber and consultant in the area of prescribing complex assistive technology. Her special interests include biomechanics, specialised seating and all types of wheeled mobility, including sports wheelchairs. Jenni has worked within the

disability sector for over 3 decades, in a great variety of roles, including clinical, research, consultancy, education and business roles. She has a depth of knowledge and experience regarding specialised equipment and the industry that surrounds it, as well as a range of formal qualifications. Jenni strives to bring formal assessment together with theory and practical knowledge in order to generate positive outcomes for her clients via the latest assistive technology. As well as running her busy private consultancy, Jenni is a current Board member of ARATA and a National Classifier in the Paralympic sport of Boccia, and continues to present regularly at industry workshops, seminars and conferences.

E11: Novel method of propulsion pattern recognition in a manual wheelchair simulator

Mr Salman Nourbakhsh, Ms Zeinab Sobhanigavagni, Dr Philippe Archambault
McGill University, Montreal, Canada

Learning objectives

1. Upon completion of the session, participants will be able to:
2. Identify four wheelchair propulsion patterns.
3. Understand how DeepLabCut Library was used to extract the wrist position coordinates using a simple webcam.
4. Understand how machine learning technique was used to classify the propulsion type.

Abstract

Background. Propulsion pattern recognition in a manual wheelchair (MWC) simulator contributes to better identify the users' propulsion techniques. It can provide them with appropriate feedback and training, in order to prevent chronic shoulder pain.

Objective. The first objective was to track and find the coordinates of the user's wrist in a recorded video. The second objective was to classify the set of wrist coordinates, which is associated with one push cycle, to one out of four possible patterns.

Methods. We used a simple webcam to record users from the side view, while they propelled the pushrim. Then, by using the open-source DeepLabCut library, we tracked and extracted the wrist position. Approximately 2000 push cycles were recorded. 80 percent of these data were used to train a machine learning algorithm and the remaining 20 percent were used to test the results, to classify the trials according to four possible propulsion patterns: arcing, semi-circular, single loop over pushrim or double loop over pushrim.

Results. We implemented three different machine learning models. First was the baseline naïve bayes, second was the random forest, and finally the last and the best was LSTM. Random forest trained the data faster but with lower accuracy. The accuracy achieved by our wrist tracking and propulsion pattern classification method, using LSTM, was around 90%.

Discussion. Three different ML models were implemented: Naïve Bayes as a reference model; Random Forest; and LSTM that outperformed the other models. Random Forest training was faster but resulted in lower accuracy comparing with LSTM model. The effectiveness of X and Y coordinates were evaluated using Random Forest. The Y coordinate resulted in a better performance by a great margin. The prediction was fast enough to be used in real time prediction.

Content references:

1) Slowik, Jonathan S., Philip S. Requejo, Sara J. Mulroy, and Richard R. Neptune. "The influence of speed and grade on wheelchair propulsion hand pattern." *Clinical biomechanics* 30, no. 9 (2015): 927-932
2) Slowik, Jonathan S., Philip S. Requejo, Sara J. Mulroy, and Richard R. Neptune. "The influence of wheelchair propulsion hand pattern on upper extremity muscle power and stress." *Journal of Biomechanics* 49, no. 9 (2016): 1554-1561
3) Morgan, Kerri A., Susan M. Tucker, Joseph W. Klaesner, and Jack R. Engsberg. "A motor learning approach to training wheelchair propulsion biomechanics for new manual wheelchair users: A pilot study." *The journal of spinal cord medicine* 40, no. 3 (2017): 304-315
4) Jayaraman, Chandrasekaran, Carolyn L. Beck, and Jacob J. Sosnoff. "Shoulder pain and jerk during recovery phase of manual wheelchair propulsion." *Journal of biomechanics* 48, no. 14 (2015): 3937-3944

Presenter biography

Salman Nourbakhsh is a Ph.D candidate in rehabilitation science at McGill university. His background is in mechanical engineering. He graduated from École de téchnologie supérieure (ÉTS) based in Montreal in master of science in automated manufacturing engineering in 2016. His passion in health along with his background in Engineering, motivated him to do his Ph.D in an interdisciplinary program, application of robotics in rehabilitation science. Salman wishes to be able to contribute to enhance human quality of life.

E12: Perceived access to livelihoods among spinal cord injury individuals in Tanzania following Motivation Peer Training

Annabelle de Serres-Lafontaine[1,2], Krista Best[2,1], Charles Batcho[2,1], Delphine Labbé[3]
[1]Université Laval, Quebec, Canada. [2]Center for Interdisciplinary Research in Rehabilitation and Social Integration (CIRRIS), Quebec, Canada. [3]University of Illinois, Illinois, USA
Annabelle de Serres-Lafontaine, OT Student and research assistant
Krista Best, Researcher and assistant professor
Charles Batcho, Researcher and associate professor
Delphine Labbé, Researcher and assistant professor

Learning objectives

Upon completion of the presentation, participants will be able to :

1. Describe the use of the International Classification of Functioning to explore access to livelihoods among individuals with spinal cord injury and what is affecting their inclusion and social participation in their community.
2. Identify personal, occupational and environmental facilitators and barriers to access to livelihoods among individuals with spinal cord injury, increasing our understanding of the challenges these individuals face daily.
3. Define strategies to refine current programming of peer training programs to meet the needs of individuals with spinal cord injury and bring awareness in the communities.

Abstract

Only 2% of people with disabilities in developing countries have access to basic services rehabilitation[1]. Peer training (PT) and Entrepreneurial Skills Training (EST) are provided by Motivation (non-profit organization) and Moshi-Cooperative University to enhance independence and occupational engagement of individuals with spinal cord injury (SCI) in developing countries[2]. The purpose of this study was to evaluate the perceived impact of PT and EST on the livelihoods of individuals living with SCI in Tanzania.

Design. Qualitative. Participants. Convenience sample of individuals with SCI who received 1-3 PT home visits (advocacy, skin/bladder/bowel care, and wheelchair skills) and 3-days of EST (economic development, entrepreneurship, and savings/support groups). Photovoice procedures. Preparatory workshop; provision of cameras/training; time to capture meaningful photos; selection of 5 best photos and group discussion; captioning photos using 5 standardized questions[3] to convey message. Analysis. Inductive content analysis of photos and captions and grouped according to the International Classification of Functioning.

Results. Ten participants (5 females) participated in Photovoice (i.e., participatory community-based approach developed to empower marginalized groups[4] and increase our understanding of the challenges disabled people face daily[5]). Two interrelated themes emerged: 1) **"Influencing factors"**, revealing participants' inclusiveness in the community influenced by their activities and participation, personal factors (i.e., self-esteem, self-efficacy) and environmental factors; and 2) **"Empowerment"**, explaining participants' perceptions about advocacy and awareness as well as their hopes for changes and a meaningful life in their community. All participants emphasised the importance of accessibility: while some were able to overcome obstacles (e.g., attend church, see a doctor), others perceived continued inaccessibility inhibited meaningful occupations (e.g., buying/selling at local market).

Conclusion. PT and EST had meaningful impact on the lives and livelihoods of individuals with SCI in rural Tanzania. Continued effort to overcome accessibility issues and advocate for their needs may further enhance attainment of gainful occupations.

Content references:

1. Despouy, L., 1993. *Human rights and disabled persons*, Study Series 6, Centre for Human Rights, Geneva.
2. Norris LK. Motivation Peer Training – Bridging the gap for people with mobility disabilities. *African J Disabil*. 2017;6(0). doi:10.4102/ajod.v6i0.350
3. Wang, C. C., Morrel-Samuels, S., Hutchison, P. M., Bell, L., & Pestronk, R. M. (2004). Flint Photovoice: community building among youths, adults, and policymakers. *American journal of public health*, *94*(6), 911–913. https://doi-org.acces.bibl.ulaval.ca/10.2105/ajph.94.6.911
4. Wang C, Burris MA. Photovoice: Concept, Methodology, and Use for Participatory Needs Assessment. *Heal Educ Behav*. 1997;24(3):369-387.
5. Dassah E, Aldersey HM, Norman KE. Photovoice and Persons with Physical Disabilities: A Scoping Review of the Literature. *Qual Health Res*. 2017;27(9):1412-1422. doi:10.1177/1049732316687731

Presenter biography

Annabelle de Serres-Lafontaine (OT student) is a graduating student in the clinical master program in occupational therapy at Université Laval and has completed the research profile. She has been a research assistant at Cirris since summer 2019 under the primary supervision of Dr. Krista Best and has completed three research internships for which she received fellowships. Her responsibilities are multiple, including mentoring, active participation in bilingual exchange groups to improve the quality of research at Cirris, participation in various trainings and her involvement in many projects. She has acquired research skills in qualitative and quantitative analysis through literature reviews, file reviews, interviews, focus groups, data analysis and article writing. Her main contributions are for the development of an adapted physical activity toolkit for community organizations in Quebec and the accessibility of services and the confinement experienced by individuals with a spinal cord injury in Quebec and Vancouver.

E13: Longitudinal analysis of OT students' participation in a wheelchair skills boot-camp

Ed Giesbrecht, Victoria Erives, Jeffrey Coletti
University of Manitoba, Winnipeg, Canada
Associate Professor

Learning objectives

On completion of the presentation, participants will be able to:

1. identify the outcomes of wheelchair skills training with OT students;
2. describe the trends over time between different student cohorts;
3. discuss how skill capacity and confidence relate to clinical practice self-efficacy

Abstract

Training skills for effective wheelchair use is one of 8 key components outlined as best practice in wheelchair service provision. However, the extent of training provided in rehabilitation is variable, frequently addressing only basic skills [1]. Clinicians identify limitations in knowledge, confidence and capacity to teach and demonstrate these skills as contributing to this disparity [2]. One strategy to ameliorate this issue is improving knowledge, confidence and capacity during entry-to-practice professional programs. A survey of Canadian occupational and physical therapy programs reported only 76% included wheelchair skills training and less than 50% use a standardized curriculum such as the Wheelchair Skills Program [3]. Several studies have reported on the use of pragmatic intensive training workshops, or wheelchair skills "boot camps", in occupational therapy professional programs [4-7]. While these studies report significant improvements, point estimates vary and have wide confidence intervals due to small size single cohorts and variations between bootcamp delivery. Variability may be related to baseline differences and whether change scores are constant or relative. A Canadian university OT program has conducted wheelchair skill bootcamps for consecutive cohorts since 2013, collecting outcomes on capacity and confidence with skill performance and, more recently, clinical self-efficacy. This presentation will report on analysis of 8 years of data (n= 308) collected from annual bootcamps run at a single site. We will report on more precise outcome estimates; trends and differences across cohorts; differences across skill subsets (basic, intermediate & advanced); relative versus raw score change; change score controlling for baseline; and associations between skill capacity, confidence in skills, and confidence to apply in clinical practice. Findings will be applied to future practice with bootcamp-based education among professions providing wheelchair service delivery.

Content references:

1) Best, K. L., Routhier, F., & Miller , W. C. (2015) A description of manual wheelchair skills training: current practices in Canadian rehabilitation centers. *Disability and Rehabilitation: Assistive Technology, 10*(5), 393-400. http://dx.doi.org/10.3109/17483107.2014.907367
2) Morgan, K. A., Engsberg, J. R., & Gray, D. B. (2017). Important wheelchair skills for the new manual wheelchair users: health care professional and wheelchair user perspectives. *Disability and Rehabilitation: Assistive Technology*, *12*(1), 28-38. https://doi.org/10.3109/17483107.2015.1063015
3) Best, K. L., Miller, W. C., & Routhier, F. (2015). A description of manual wheelchair skills training curriculum in entry-to-practice occupational and physical therapy programs in Canada. *Disability and Rehabilitation: Assistive Technology, 10*(5), 401-406. https://doi.org/10.3109/17483107.2014.907368
4) Giesbrecht, E. M., Wilson, N., Schneider, A., Bains, D., Hall, J., &

Miller, W. C. (2015). Preliminary evidence to support a “boot camp” approach to wheelchair skills training for clinicians. *Archives of Physical Medicine and Rehabilitation, 96*(6), 1158-1161. https://doi.org/10.1016/j.apmr.2014.10.002

5) Rushton, P. W., & Daoust, G. (2019). Wheelchair skills training for occupational therapy students: comparison of university-course versus “boot-camp” approaches. *Disability and Rehabilitation: Assistive Technology, 14*(6), 595-601. https://doi.org/10.1080/17483107.2018.1486468
6) Smith, E. M., Best, K. L., & Miller, W. C. (2020). A condensed wheelchair skills training ‘bootcamp’ improves students’ self-efficacy for assessing, training, spotting, and documenting manual and power manual wheelchair skills. *Disability and Rehabilitation: Assistive Technology, 15*(4), 418-420. https://doi.org/10.1080/17483107.2019.1572231
7) Giesbrecht, E. M., Carreiro, N. & Mack, C.M. (2021). Improvement and retention of wheelchair skills training for students in entry-level occupational therapy education. *American Journal of Occupational Therapy, 75,* online 1-7. https://doi.org/10.5014/ajot.2021.040428

Presenter biography

Ed Giesbrecht began working as an occupational therapist in 1994, developing a particular interest in assistive technology and wheeled mobility, serving as clinical specialist in an Assistive Technology clinic in Winnipeg, Canada. His research interest drew him to academia to pursue a master’s and PhD degree. He is an Associate Professor in the department of Occupational Therapy at the University of Manitoba. His research focuses on strategies to address wheelchair mobility skills and training, improving entry-to-practice education, and winter mobility.

P7: Blind spot sensor systems for power-wheelchairs

Alice Pellichero[1,2], PhD Krista Best[1,2], PhD François Routhier[1,2], PhD Pooja Viswanathan[3], PhD William Miller[4]
[1]Université Laval, Québec, Canada. [2]Center for Interdisciplinary Research in Rehabilitation ans Social Integration (Cirris), Québec, Canada. [3]CEO, Braze Mobility Inc., Toronto, Canada. [4]University of British Columbia, Vancouvert, Canada
Alice Pellichero, PhD Candidate

Learning objectives

At the end of this presentation, participants will be able to:

1. recognize the interest of obstacle detection technology to safe PWC driving
2. determine which PWC users can use a blind spot sensor system in daily life
3. identify individuals needs related to obstacle detection technology

Abstract

Introduction. Blind spot sensor systems can improve power-wheelchair (PWC) safety.

Objectives. Compare accuracy of rear obstacle detection in a PWC with and without a sensor system; explore cognitive task load and perceived usability, safety, confidence and awareness; 3) explore PWC users' perceptions in real-world settings.

Methods. A mixed-method design was used. PWC users were provided the sensor system. In laboratory setting, accuracy and time of obstacles detection were notified. Twenty-two randomized conditions were completed with and without the sensor system. Cognitive task-load (*NASA-Task Load Index*), perceived usability (*Usability Metric for User Experience-LITE*) and safety, confidence and awareness (Likert-scale) were evaluated. Participants then used the sensor system at home for two-months before completing semi-structured interviews. Statistical (descriptive, t-tests) and thematic analysis were conducted.

Results. Among 11 PWC users (age=67.5±7.5y), obstacles were detected more accurately (p<0.001) and rapidly (p<0.001) with sensor system than without. Using the sensor system required lower cognitive task-load (p=0.005) and was perceived as easy to use. No improvements in safety, confidence or awareness were perceived. Four participants reported continued use after 2 months. Those who discontinued use reported lack of usefulness and technical issues. Three themes emerged: perceived usefulness (improved performance and confidence), barriers to use (technical issues and charge), and recommendations (personalization and design improvements).

Conclusions. Sensor systems may improve rear obstacle detection accuracy and time while reducing cognitive task load. However, technical and service improvements have to be made. Users' characteristics, environments and occupations play an important role in using obstacle detection technology.

Content references

1) Heerink M, Kröse B, Evers V, Wielinga B. (2010) Assessing Acceptance of Assistive Social Agent Technology by Older Adults: the Almere Model. Int J of Soc Robotics ;2:361–75. https://doi.org/10.1007/s12369-010-0068-5.
2) Rushton PW, Mortenson BW, Viswanathan P, Wang RH, Miller WC, Hurd Clarke L, et al. (2017) Intelligent power wheelchair use in long-term care: potential users' experiences and perceptions. Disability and Rehabilitation: Assistive Technology ;12:740–6. https://doi.org/10.1080/17483107.2016.1260653.

3) Viswanathan P, Zambalde EP, Foley G, Graham JL, Wang RH, Adhikari B, et al. (2017) Intelligent wheelchair control strategies for older adults with cognitive impairment: user attitudes, needs, and preferences. Auton Robot ;41:539–54. https://doi.org/10.1007/s10514-016-9568-y.

Presenter biography

Alice Pellichero is an occupational therapist. At the beginning of her career she worked in France in rehabilitation centers is neurology services with adults. She is currently conducting a clinical research project as part of the doctoral program in clinical and biomedical sciences at Université Laval (Québec City, Canada). She is attached to the Interdisciplinary Research Center for Rehabilitation and Social Integration (CIRRIS) and is under the direction of Dr. François Routhier (CIRRIS), Dr. Krista Best (CIRRIS) and Dr. Eric Sorita (Bordeaux University). The aim of her research project is to enhance powered mobility device provision through better assessment and training. Realization of this research will lead to the development of a novel PWC driving program that may improve access to PWC mobility for individuals who may have otherwise been excluded. In turn, successful PWC mobility could improve participation and quality of life for the individuals.

P8: Getting in Trouble Together: Use of Assistive Technology to Facilitate Toddler Participation

Rachel Maher
Permobil New Zealand, Auckland, New Zealand
Clinical Education Specialist

Learning objectives

Participants will:

1. Review what participation looks like for typically developing toddlers
2. Hear three case examples of how use of assistive technology has facilitated participation in non-typically developing children
3. Hear feedback from parents about how assistive technology has facilitated participation for their child in family life

Abstract

Toddlers are busy little humans, with research suggesting they are frequently on the move, engaged in play or interacting with the world around them. The therapeutic benefits of early mobility for young people with mobility challenges have been well documented in the research, however the impact on how this mobility impacts on how toddlers participate in family life has not been documented to the same extent.

The Explorer Mini was launched in 2020, with early trials offering delightful stories of toddlers being typical toddlers. These are toddlers who had significant mobility challenges and require assistive technology to obtain age-appropriate mobility, who now have a device that allows them to explore their home, venture to the park with their family, chase the cat and interact with their older siblings, adventures that are familiar to many of us with typically developing children.

As part of the early Explorer Mini trials, feedback has been received from parents who have highlighted what assistive technology has meant to them as a family. An emerging theme of this feedback is how the device has created a shift away from their child being dependent on others, to having periods of being independent and an active participant in family life, becoming the busy little human we know toddlers to be.

In this session we review the impact of assistive devices on how young people participate in their world, including from the perspective of a parent who has experienced firsthand the positive impact assistive technology can have for young people.

Content references

1) Feldner, H.A., Logan, S.W. & Galloway, J.C. (2018) Mobility in pictures: a participatory photovoice narrative study exploring power mobility provision for children and families. Disability and Rehabilitation: Assitive Technology. DOI: 10.1080/17483107.2018.1447606
2) Kenyon, L.K., Mortenson W.B. & Miller, W.C. (2018). 'Power in Mobility': parent and therapist perspectives of the experiences of children learning to use powered mobility. Developmental Medicine and Child Neurology. DOI: 10.1111/dmcn.13906
3) Livingston, R. & Field, D. (2015) The child and family experience of power mobility: a qualitative synthesis. Developmental Medicine and Child Neurology. DOI: 10.1111/dmcn.12633

Presenter biography

Rachel Maher graduated from the University of Otago in 2003 with a Batchelor of Physiotherapy, and later gained her Post Graduate Diploma in Physiotherapy (Neurorehabilitation) in 2010.

After graduating, Rachel gained experience in inpatient rehabilitation and community Physiotherapy, before moving into a Child Development Service, working with children aged 0 to 16 years.

Rachel developed a passion for seating and mobility while working children, recognising the value of a team approach to wheelchair and seating provision to achieve the best outcomes for end users.

Rachel later moved into a Wheelchair and Seating Outreach Advisor role at Enable New Zealand in 2014, complementing her clinical knowledge with experience in New Zealand Ministry of Health funding processes.

Rachel joined Permobil in June 2020, and is passionate about education and working collaboratively to achieve the best result for our end users.

P9: Evaluating clinical outcomes of modular wheelchair seating solutions in Muscular Dystrophy: a case study

Miss Bridget Churchill
Life for Living Ltd, Dover, United Kingdom.
Spex Ltd, Christchurch, New Zealand
Occupational Therapist & Clinical Educator

Learning objectives

1. Identify 3 outcome measures that are relevant for adults with Muscular Dystrophy.
2. Name 5 reasons why seated mobility may be abandoned or under-utilised.
3. Name 4 factors that can influence physical and emotional comfort for wheelchair users

Abstract

A single case study will be presented about a wheelchair user with Muscular Dystrophy over a 2 year period and during the COVID-19 pandemic in the UK. In collaboration with the therapist team, it will highlight the importance of matching person and technology and a person-centred approach.

Body shape distortions are avoidable (Robertson et al., 2016), however progressive neurological conditions can lead to challenges that the wheelchair seating systems and services need to respond to effectively. The value of informed decision-making is evident when optimising postural presentation can be perceived as functionally restrictive or not aligned with wheelchair users' goals or wellbeing – matching the person with technology requires an understanding of these factors (Scherer, Craddock & Mackeogh, 2011) to facilitate the 'bigger picture' for community inclusion.

Selection of the seating system requires a shared perspective to ensure goals relating to comfort, function and posture converge within wheelchair provision for the wheelchair user and prescribing clinician. Wheelchair seating reviews ideally should be in anticipation rather than in response to deterioration (Richardson et al., 2009). There is added risk of assistive technology abandonment due to progression of health limitations and 'negative factors' (Ravneberg, 2012) if the wheelchair seating system is unable to respond to these changes and service providers unable to plan for anticipate changes.

The impact of Spex modular seating technology was evaluated from initial introduction (transition from existing specialist system) and to present date, taking into considering the impact of the COVID pandemic and additional challenges with 24-hour postural care. Evaluations included visual analogue pain scale, mood assessments, photographs, interviews, Goal Attainment Scale (GAS) and physical measurements.

The decision to use a modular seating system was based on personal choice and will be shown to be appropriate in responding to functional and postural changes to optimise posture, comfort and function.

Content references

1) Ravneberg, B. (2012). Usability and abandonment of assistive technology. Journal of Assistive Technologies, 6(4), 259–269. https://doi.org/10.1108/17549451211285753
2) Richardson, Marion & Frank, Andrew. (2009). Electric powered wheelchairs for those with muscular dystrophy: Problems of posture, pain and deformity. Disability and rehabilitation. Assistive technology. 4. 181-8. 10.1080/17483100802543114.
3) Robertson, J., Baines, S., Emerson, E., & Hatton, C. (2018). Postural care for people with intellectual disabilities and severely impaired motor function: A scoping review. Journal of Applied Research in Intellectual

Disabilities, 31(S1), 11–28. https://doi.org/10.1111/jar.12325
4) Scherer, M. J., Craddock, G., & Mackeogh, T. (2011). The relationship of personal factors and subjective well-being to the use of assistive technology devices. Disability and rehabilitation, 33(10), 811–817. https://doi.org/10.3109/09638288.2010.511418

Presenter biography

Bridget Churchill has over 20 years experience with working with adults and older adults with neurological difficulties and additional diagnoses. She has extensive experience in physical rehabilitation and postural care for neurological and adult/elderly populations. Bridget believes that life is for living to the fullest and works with clients to ensure that their goals are the focus and that independence and skills are improved, supporting individuals to problem-solve barriers to their chosen level of participation.

P10: Meeting Changing Seating Needs Post Hip surgery

Tracee-lee Maginnity
Permobil, Sydney, Australia,
Clinical Education Specialist

Learning objectives

1. Attendees will be able to articulate at least one post surgical positioning requirement
2. Attendees will be able to identify at least 2 points of control that where changed within this case example
3. By end of session identify at least two reasons why hip surgery is recommended

Abstract

Hip surgery is a common procedure encountered within the pediatric population. Hip surveillance studies, 24 hour postural management evidence and orthopedic intervention provides guidance and protocols around prevention and post-surgical positioning. In NSW the hospital will attempt to re configure the existing mobility base and seating to meet discharge requirements or lend equipment from a limited loan pool, but it often falls to the community OT to access alternative equipment to meet the required temporary seating and mobility needs.

This case study follows a young NSW boys' experiences with mobility and seating adjustments through hip and spinal surgical intervention and beyond. We will look at how adjustable modular seating can be configured to meet changing needs, some of the barriers encountered along the way from access to equipment, the funding process and crucial seated position reconfigurations. In an ideal world how would we do things differently? The perspective of the family, client and primary prescribing therapists will be shared during the session.

Content references

1) Soft-tissue release for spastic hip subluxation in cerebral palsy Miller F Cardoso Dias R Dabney KW Lipton GE Triana M. Paediatric Orthopaedic. 1997 Sep-Oct;17(5):571-84
2) Adductor surgery to prevent hip displacement in children with cerebral palsy: the predictive role of the Gross Motor Function Classification System.Shore BJ, Yu X, Desai S, Selber P, Wolfe R, Graham HK.J Bone Joint Surg Am. 2012 Feb 15;94(4):326-34. doi: 10.2106/JBJS.J.02003.
3) Effects of different seating equipment on postural control and upper extremity function in children with cerebral palsy Dilek Sahinoğlu 1, Gürsoy Coskun 1, Nilgün Bek 1 Prosthet Orthot Int. 2017 Feb;41(1):85-94
4) Physical risk factors influencing wheeled mobility in children with cerebral palsy: a cross-sectional study Elisabet Rodby-Bousquet 1 2, Ginny Paleg 3, Jackie Casey 4, Alicja Wizert 5, Roslyn Livingstone. BMC Pediatr. 2016 Oct 10;16(1):165
5) Prevention of hip displacement in children with cerebral palsy: a systematic review. Miller SD, Juricic M, Hesketh K, Mclean L, Magnuson S, Gasior S, Schaeffer E, O'donnell M, Mulpuri K. Dev Med Child Neurol. 2017 Nov;59(11):1130-1138.
6) Spine deformities in patients with cerebral palsy; the role of the pelvis. Hasler C, Brunner R, Grundshtein A, Ovadia D. J Child Orthop. 2020 Feb 1;14(1):9-16.
7) Association between pelvic obliquity and scoliosis, hip displacement and asymmetric hip abduction in children with cerebral palsy: a cross-sectional registry study. Hägglund G. BMC Musculoskelet Disord. 2020 Jul 14;21(1):464.
8) Severe hip displacement reduces health-related quality of life in children with cerebral palsy.Ramstad K, Jahnsen RB, Terjesen T.Acta Orthop. 2017 Apr;88(2):205-210

Presenter biography

Tracee-lee Maginnity joined Permobil Australia in July 2019, as a clinical education specialist. Originally from New Zealand, she graduated Auckland University of Technology with a BHSc (Occupational Therapy) in 2003 and has since worked in various roles related to seating and mobility including assessing, prescribing and educating. After gaining experience as an assessor and prescriber at Seating To Go / Wheelchair Solutions in prescribing for both disability and injury, she moved to Australia in 2011 to take on the Senior Occupational Therapist role in a custom moulded seating service. She then worked in clinical consulting and education roles until joining Permobil. Tracee-lee is passionate about maximising functional outcomes with end users and the importance of education within the industry. She has mentored many therapists interested in AT. Her experience includes working with complex postures to achieve custom outcomes.

P11: *Use of Virtual Boundaries to Facilitate Safer Community Access: A Case Study of Customisation*

Mrs Sandra Malkin, Mr Richard Sutton
EMHS, Perth, Australia
Mrs Sandra Malkin, Occupational Therapist
Mr Richard Sutton, Technician

Learning objectives

1. Consider areas in which Geofencing may improve a client's safe and independent community access
2. Outline ways that the safety of community access/involvement may be improved despite reduced supervision resources
3. Demonstrate an understanding of low cost solutions to complex individual client requirements.
4. Have a working knowledge of elements to consider when designing or purchasing similar systems or augmentations.

Abstract

Miss C is a long term powered wheel chair user of over fifty years. She remains fiercely independent, continuing to enjoy exploring her immediate and wider environment and dislikes being contained or supervised by support workers.

The Rehabilitation Technology Unit was approached by the Occupational Therapist working at her care facility who expressed concern about her tendency to wander un-supervised, often becoming lost or stranded. Along with the obvious issues, she was also placing herself and others in danger by crossing nearby busy roads with little regard to traffic.

Using a concept called Geofencing, the Rehabilitation Technology Unit was able to set up two virtual GPS monitored perimeters- A hard and a soft boundary. The area within the soft boundary was the safe zone where Miss C was free to roam as she pleased. The area between the hard and soft boundaries acted as a warning buffer and the area outside the hard boundary was a no go zone where the chair was automatically disabled.

In addition to the chair being disabled, as Miss C attempted to travel outside of the 'warning zone' staff were notified via SMS. The notification SMS included a map showing the chair's location in the event that she needed' rescuing' or the chair needed reactivating. Prior to crossing the "hard boundary" and leaving the safe zone, Miss C was warned that she was approaching a hard boundary, with an audible warning saying that she needed to return to the safe zone and the chairs functionality was greatly reduced

Using an innovative and individualised participant centred approach, this system has enabled Miss C to continue to connect with her local community, given her added independence, and improved the safety of herself and others.

Content references

1) Neven, A., Vanrompay, Y., Declercq, K., Janssens, D., Wets, G., Dekelver, J., Daems, J., & Bellermans, T. (2017) Viamigo: Monitoring tool to support independent travel by persons with intellectual disabilities. *Journal of the Transportation Research Board* 2650 (1) 25-32. Doi: 10.3141/2650-04
2) Schaathun, H., Molnes, S., Berg, H., & Alnes, R. (2014) Electronic Tracking of Users with Cognitive Impairment: Contrasting a Literature Review with Local Experience. In E. Jaatun, E. Brooks, K. Berntsten, and M Jaatun (eds) *Pro- ceedings of the 2nd European Workshop on Practical Aspects of Health Informatics*. Trondheim, Norway. retrieved from http://ceur-ws.org

3) Târnaucă, B., Puiu, D., Nechifor, S., & Comnac, V. (2013). Using Complex Event Processing for implementing a Geofencing service. IEEE 11th International Symposium on Intelligent Systems and Informatics (SISY), Subotica, Serbia, pp. 391-396, doi: 10.1109/SISY.2013.6662608.

Presenter biography

Sandy Malkin completed her Occupational Therapist degree at Curtin University in Perth, Australia. She has worked predominantly in Perth in a variety of settings, but also spent several years working and travelling in the United Kingdom and the United States of America.

Her primary focus has been in the area of adult rehabilitation, particularly working with clients with spinal cord injury. She is currently working at the State Rehabilitation Service in Perth within the Rehabilitation Technology Unit. She specialises in complex seating within powered wheelchairs, and embracing current and emerging technology to enable individuals with significant disability to operate their powered wheelchair via alternate control systems.

Richard Sutton has spent his working life accumulating transferable skills and knowledge from various trades and professions. He has worked and or gained qualifications in fields as diverse as automotive mechanics, Data/communications networking, Environmental science and Shotfiring (explosives) to name but a few.

He is currently in a technical role supporting occupational therapists at the state rehabilitation service of Western Australia. He uses his broad and unique skill set to find solutions to the complex needs of individuals with a difference and thrives on the challenges this presents

A12: Supporting psychological wellness in children and families with disabilities / medical conditions: reflections from paediatric practice. (90min INTERACTIVE SESSION)

Nicola McDonald, Helen Thorne
CDHB, Christchurch, New Zealand
Nicola McDonald, Child Health Psychologist
Helen Thorne, Senior Physiotherapist and Physiotherapy Team Leader, Canterbury Child Development Service

Learning objectives

Participants will:

1. Strengthen their understanding of the psychological and emotional challenges children with disabilities / chronic medical conditions may experience.
2. Strengthen their understanding of the family experiences of disability/chronic medical conditions, especially at important points of the care journey.
3. Learn practical ways to support children and families in this sphere and when to seek extra support around psychological and emotional wellbeing.

Abstract

Children with disabilities / chronic medical conditions and their whanau face a unique set of challenges. In this presentation common psychological and emotional difficulties experienced by this population will be discussed. We will explore the impact these can have on children and their whanau, and the complex interactions between psychological and physical factors (including pain). We will talk about issues arising at different life stages including when children transition into wheelchairs, trial new equipment or experience progression of their condition. The concepts of chronic sorrow and grief will be used to explore family journeys.

Together we will reflect on some case examples and discuss practical strategies for supporting the psychological wellbeing of children and families we are working with. Indicators for seeking further support for families will also be outlined.

Content references:

1) Brown J (2013) Recurrent grief in mothering a child with an intellectual disability to adulthood: grieving is the healing Child and Family Social Work 113-122

2) Coughlin M.B. and Sethares K.A. (2017) Chronic Sorrow in Parents of Children with a Chronic Illness or Disability: An Integrative Literature Review Journal of Pediatric Nursing 37:

3) Rudebek, S. (2020). The psychological experience of children with cerebral palsy. Paediatrics and Child Health, 30 (8), p. 283-288

4) Yehene, A. Ben-Valid, S., Golan, S., Bar-Nadav, O. & Landa, J. (2019): Factors associated with parental grief reaction following pediatric acquired brain injury, Neuropsychological Rehabilitation.
5) Young S, Shakespeare-Finch J, & Obst P (2020) Raising a child with a disability: a one-year qualitative investigation of parent distress and personal growth. Disability & Society 35 (4), 629-653

Presenter biography

Nicola McDonald has been a Child and Family Psychologist in Christchurch for nearly ten years, the last five of which have been in

Christchurch Hospital's paediatric department as a Child Health Psychologist. She primarily supports children and young people experiencing psychological difficulties which link to their medical conditions/disabilities. She provides assessment and individual, family and group intervention. Nicola has special interests in anxiety and pain and works closely with colleagues from the Child Development Service. She holds a Masters of Child and Family Psychology (First Class Hons) and lectures on Canterbury University's Child and Family Psychology Programme.

Helen Thorne is physiotherapy Team Leader at the Child Development Service, CDHB. She has 20 years' experience working with children and adults with health conditions and disabilities, and has a Post-graduate Diploma in Rehabilitation. Helen provides therapy, equipment and seating solutions for children/young people newborn-16 years of age, working within an interdisciplinary team. Helen supports staff within CDHB Child Development Service as well as West Coast DHB and local adult services, providing supervision, teaching and advice, especially in the areas of physiotherapy management, complex seating, and lying supports. She is a member of the Enable NZ panel reviewing clinician's case studies for accreditation in Wheeled Mobility and Postural Management.

Helen and Nicola are both passionate about working with children/young people and their families, and supporting them to achieve their goals.

B10: Moving towards guided self-assessment and personal budgets for seating and mobility equipment: Through the lens of Enabling Good Lives. (90 min INTERACTIVE SESSION)

Cath Williams, Portfolio Manager Disability Directorate, NZ Ministry of Health
Rachael Burt, Director, Disabled People and Whanau Supporting Mana Whaikaha
Natasja Chapman –Operations Director, Enable New Zealand

Presenter biography

Cath Williams, Portfolio Manager Disability Directorate, Ministry of Health. Being an Occupational Therapist has informed my work as a Manager of Rehabilitation services and Assistive Technology services, in Australia, over 30 years.
Since returning to New Zealand, 8 years ago, I led the design, procurement and implementation of ACC's Disability services, Living my Life. I am currently the Portfolio Manager managing the Equipment and Modification Services in the Disability Directorate, Ministry of Health.
I believe that people are the holders of knowledge about what is important to them to achieve the outcomes needed to engage in their chosen life roles. I am committed to the removal of barriers to participation and the rollout of Enabling Good Lives – Disability transformation.

Rachael Burt, Director, Disabled People and Whanau Supporting Mana Whaikaha
Tēnā tātou katoa,
I'm Rachael the Director of Mana Whaikaha. Mana Whaikaha is the prototype in the MidCentral region that was co-designed with community to prototype a transformed approach to the Disability Support System, based on the Enabling Good Lives Vision and Principles.
Prior to Mana Whaikaha, I have had the honour of working in the Disability Sector for over 20 years in varying roles including working in Enable NZ, Needs Assessment and Service Coordination and a National Disability Support Provider.
As someone who identifies as a Disabled Person, I have been excited to support the development of removing environmental barriers, through and Enabling Good lives approach, working towards a fully inclusive society where disabled people are leaders of their own lives.

Natasja Chapman has been with Enable New Zealand since August 2017. Prior to taking up her current role as Director, Operations, she held the position of Enable New Zealand's Service Manager for Housing. Natasja has previously held positions at the Ministry of Business Innovation and Employment and also at Immigration New Zealand Palmerston North, where she held several roles including Operations Manager for four years. She has also been part of the project considering how Equipment can be accessed via personal budgets, in the context of transforming the disability sector.

C12: Exploring power mobility use – a learning approach for children and adults with cognitive impairment

Lisbeth Nilsson
Associated to Lund University, Sweden
Occupational Therapists

Learning objectives:

1. Discuss why it is a powerful activity to explore power mobility use
2. Explain possible benefits of exploring power mobility use ahead of ability to drive goal-directed
3. Motivate application of the ALP tool for assessment and facilitation of tool use learning

Abstract

If children and adults with multiple and complex disabilities involving cognitive impairment, are given opportunities to explore power mobility experiences, their consciousness of tool use can grow. Power mobility devices are powerful mediators of experiences promoting development and learning. Exploring possible effects of acting on joystick or switch/es operating the device, offers the user a variety of effects, sensations and learning experiences impacting body and relations to environment.

The ALP tool originates from research projects carried out by Nilsson (Driving to Learn) and Durkin (Moving forward). Both projects focused on gaining understanding of the learning process and how to facilitate tool use learning through power mobility experience. The ALP tool includes the ALP-instrument for assessment of the eight phases and three stages in the learning process, and the ALP-facilitating strategies guides the approach for each phase and stage in the process. The ALP is process-based as it connects assessment of a user's actual phase in the tool use learning process with appropriate facilitating strategies for each phase and stage. Assessment and facilitation is carried out in real context and set up for each individual's abilities, needs and possible motives. Assessment is based on observation and interpretation of learner performance in the moment and facilitation is aiming at providing the just right challenge at each moment of an intervention situation.

Elucidating possible learning benefits in earlier phases of the learning process can assist clinicians who wish to use powered mobility as a learning experience. The learning approach Assessment of Learning Powered mobility use supports recognition of minor changes in performance indicating small successes and steps forward ahead of reaching goal-directed driving. It also guides how to facilitate this progress at each of the phases in the process. Using the full ALP is emphasized as a pre-requisite for successful outcome.

References:

1) Nilsson, L. Driving to Learn. The process of growing consciousness of tool use – a grounded theory of de-plateauing [dissertation]. [Lund, Sweden]: University of Lund; 2007. Available at: https://lup.lub.lu.se/search/publication/548098
2) Nilsson L. Powered mobility for people with profound cognitive disabilities leads to developing occupational performance. British Journal of Occupational Therapy. 2019;82(11)655–657.
3) Durkin J. Developing powered mobility with children who have multiple and complex disabilities: Moving forward [dissertation]. [Brighton, UK]: University of Brighton; 2006.
4) Nilsson L., & Durkin J. Assessment of learning powered mobility use—Applying grounded theory to occupational performance. Journal of Rehabilitation Research and Development. 2014;51(6):963–74.

5) Nilsson L., & Durkin J. Powered mobility intervention: understanding the position of tool use learning as part of implementing the ALP tool. Disability and Rehabilitation: Assistive Technology. 2017;12(7):730-739.
6) Svensson, E. & Nilsson, L. Inter-rater reliability of the assessment of learning powered mobility use, version 2.0, when applied with children and adults engaged in Driving to Learn in a powered wheelchair. Australian Occupational Therapy Journal. 2021; 68(2): 115-123.

Presenter Biography

Lisbeth Nilsson is a PhD and specialist in occupational therapy and associated researcher of Occupational Therapy and Occupational Science at Lund University, Sweden. She developed the intervention Driving to Learn™ in powered wheelchair for people with profound cognitive disabilities. Her special interests are tool use learning and assessment and facilitation of the learning process. She and her collaborator Durkin, PhD and OT, UK, developed the Assessment of Learning Powered mobility use (ALP).

Her current focus is implementation of the ALP tool in powered mobility intervention and other fields of assistive technology. She is actually collaborating and carrying out research nationally and internationally with OTs, PTs and SLPs; and she has presented and published her findings worldwide since 1998.

D13: Time for a Switch: The Evaluation of Non-Proportional Drive Controls

Mr John "Jay" Doherty
Pride Mobility Products Corporation, Exeter, PA, USA
Director Clinical Education

Learning objectives

1. Participants will apply the hierarchy of drive controls to the selection of non-proportional drive control selection.
2. Participants will explain 2 programming features available for non-proportional drive controls that can increase independence and maximize function.
3. The Participant will discuss 2 options for controlling power seat functions when utilizing non-proportional input devices.

Abstract

There are many considerations to make when assessing an individual for power mobility use. The decisions made will impact not only the individual's mobility, but also how they reposition themselves, interact socially, and access their environment. There are many options for non-proportional drive controls on the market today, so how does the therapist and supplier choose the correct device when a proportional device is not an option? This course will review the hierarchal decision tree to allow the participant to understand how to decide which non-proportional input device is best for the individual they are working with. The course will use videos and case studies to assist in showing actual devices being utilized.

Content references:

1) Hill, M., Salatin, B. (2019). American Journal of Occupational Therapy, August 2019, Vol. 73, 7311515268. https://doi.org/10.5014/ajot.2019.73S1-PO5056
2) Lange, M. L., Minkel, J., (2018). Seating and Wheeled Mobility: A Clinical Resource Guide. Thorofare, NJ: Slack Incorporated.
3) Dolan, M., J., & Henderson, G.I. (2017). Control devices for electrically powered wheelchairs: prevalence, defining characteristics and user perspectives. Disability and rehabilitation. Assistive technology, 12(6), 618–624. https://doi.org/10.1080/17483107.2016.1201154
4) Rosen, L., Plummer, T., Sabet, A., Lange, M., & Livingstone, R. (2017, November 02). RESNA Position on the Application of Power Mobility Devices for Pediatric Users-Update 2017. Retrieved from www.resna.org
5) Kenyon, L. K., Farris, J. P., Gallagher, C., Hammond, L., Webster, L. M., & Aldrich, N. J. (2016). Power Mobility Training for Young Children with Multiple, Severe Impairments: A Case Series. Physical & Occupational Therapy in Pediatrics, 2638(March), 1–16. http://doi.org/10.3109/01942638.2015.1108380

Presenter biography

Jay Doherty has 26 years of experience working in the assistive technology field with a concentration in complex rehab technology. As the director of clinical education at Quantum Rehab, Jay presents nationally and internationally on seating and wheeled mobility, focusing on evaluation and application of available technologies.

Before joining Quantum, Jay worked in both rehabilitation and assistive technology settings. His expertise ranges from pediatrics to adults. His presentations reflect a strong emphasis on different technology interventions. Jay currently sits on the Mobility Management Editorial Board and holds his ATP and SMS certifications from RESNA.

D14: Physical risk factors influencing wheeled mobility in children with cerebral palsy

Mrs Jackie Casey[1,2], Associate professor Elisabet Rodby-Bousquet[1,3]
[1]Lund University, Lund, Sweden. [2]Belfast Health & Social Care Trust, Belfast, United Kingdom. [3]Centre for Clinical Research, Västerås, Sweden
Mrs Jackie Casey, Advanced Practitioner Occupational Therapist
Associate professor Elisabet Rodby-Bousquet, Physiotherapist

Learning objectives

Upon completion of this presentation, participants will be able to:

1. Describe what ratio of children with cerebral palsy independently use manual wheelchairs indoors or outdoors
2. Recognise that the majority of children with cerebral palsy do not independently self-propel a wheelchair
3. List at least 2 risk factors for not being able to independently use wheeled mobility indoors or outdoors
4. Compare how many children with cerebral palsy use manual and powered mobility outdoors

Abstract

Background: There is a lack of understanding of the factors that influence independent mobility and participation in meaningful activities. The purpose of this study was to analyse physical factors influencing independent use of manual and power wheelchairs in a total population of children with cerebral palsy (CP).

Methods: A cross-sectional study based on the most recent examination of all children with CP, born 2002–2013, reported into the Swedish cerebral palsy registry (CPUP), from January 2012 to June 2014. There were 2328 children (58 % boys, 42 % girls), aged 0–11 years, at all levels of gross motor function and hand function. Hazard ratios adjusted for age and sex were used to calculate the risk for not being able to self-propel based on Gross Motor Function Classification System (GMFCS) levels, upper extremity range of motion and hand function including Manual Ability Classification System (MACS), House functional classification system, Thumb-in-palm deformity, Zancolli (spasticity of wrist/finger flexors) and bimanual ability.

Results: In total 858 children used wheelchairs outdoors (692 manual, 20 power, 146 both). Only 10 % of the 838 children self-propelled manual wheelchairs, while 90 % were pushed. In contrast 75 % of the 166 children who used power mobility outdoors were independent. Poor hand function was the greatest risk factor for being unable to self-propel a manual wheelchair, while classification as GMFCS V or MACS IV-V were the greatest risk factors for not being able to use a power wheelchair independently.

Conclusions: The majority of children with CP, aged 0–11 years did not self-propel manual wheelchairs regardless of age, gross motor function, range of motion or manual abilities. Power mobility should be considered at earlier ages to promote independent mobility for all children with CP who require a wheelchair especially outdoors.

Content references:

1) Casey J, Paleg G, Livingstone R. Facilitating child participation through power mobility. The British Journal of Occupational Therapy. 2013;76(3):157–9.
2) Kenyon L, Mortenson WB, Miller W. 'Power in mobility': parent and therapist perspectives of the experiences of children learning to use powered mobility. Dev Med Child Neurology, 2018, 60(10): 1012-1017.
3) Livingstone R, Paleg G. Practice considerations for the introduction

and use of power mobility for children. Dev Med Child Neurol. 2014;56(3):210–21.
4) Livingstone R, Field D. The child and family experience of power mobility: a qualitative synthesis. Dev Med Child Neurol. 2015;57(4):317–27.
5) Rodby-Bousquet E, Paleg G, Casey J, Wizert A, Livingstone R. Physical risk factors influencing wheeled mobility in children with cerebral palsy: a cross-sectional study. BMC Pediatrics, 2016, 16: 395-406.

Presenter biography

Jackie Casey works as an Advanced Practitioner Occupational Therapist in specialised seating in the Rehabilitation Engineering Centre, a regional service for Northern Ireland. Employed 3 days per week in this service by Belfast Health & Social Care Trust. Here I guide local therapists into interpreting postural assessments into optimal wheelchair seating systems that enable persons with complex physical disabilities and their families (where appropriate) to optimise their ability to independently function, engage in everyday life, and have fun.

Currently studying 2 days/ week on PhD with Department of Clinical Medicine – Orthopaedics, Lund University. Undertaking registry-based research with a population of Swedish children with cerebral palsy (CP) aged birth to 18 years. Primary focus of my research is an exploration of the relationship between postural asymmetries, deformities and contractures, pain, and ability to change position upon supine lying, sitting and independent wheelchair mobility of these children.

D15: Power-wheelchair users with severe cognitive impairment can improve their capacities

Alice Pellichero[1,2], PhD Lisa Kenyon[3], PhD Krista Best[1,2], PhD Éric Sorita[4], PhD François Routhier[1,2]
[1]Université Laval, Québec, Canada. [2]Center for Interdisciplinary Research in Rehabilitation and Social Integration (Cirris), Québec, Canada. [3]Grand Valley State University, Grand Rapid, USA. [4]Université de Bordeaux, Bordeaux, France, PhD Candidate

Learning objectives

At the end of this presentation, participants will be able to:

1. describe power wheelchair training approaches applicable for users with cognitive impairment
2. discuss whether a future power wheelchair user has learning potential
3. discuss how learning potential may be considered in terms of anticipating improvements in PWC performance

Abstract

Introduction. Power-wheelchairs (PWC) facilitate mobility, occupational engagement and social participation. Training future PWC users during PWC provision is a recommendation from the World Health Organization. However, individuals with cognitive impairment may be precluded from PWC provision before they get a chance to benefit from training.

Objectives. Identify PWC training approaches available to individuals with cognitive impairment; and explore the influence of training on PWC capacities and on cognitive scores for PWC users with cognitive impairment.

Method. A systematic revue of the literature was realized (MEDLINE, CINAHL, EMBASE, PsycINFO, Web of Science). Studies (inclusive of research designs) including PWC users (all ages) who received PWC training and reported PWC capacities and cognitive scores. Two authors independently screened study eligibility. Levels of evidence (*Oxford Center for Evidence-Based Medicine*) and methodological quality (*Mixed-Methods-Appraisal-Tool*) were noted. (PROSPERO, CRD42019118957)

Results. Ten studies were included, including two randomized control trials and six single research design. Five included children and two included older adults. Seven PWC training approaches were identified (from the most standardized to the most individualized). The ten studies reported significative improvements of PWC capacities after PWC training. Four studies presented that the cognitive scores also improved after training.

Conclusion. Acknowledging that individuals with severe cognitive impairment can improve their PWC capacities, people with severe cognitive impairment could not be precluded to PWC provision before they get a chance to improve their capacities. Next steps in research will be to identify the best learning strategies to train future PWC users with cognitive impairment.

Content references:

1) Benford, F. (2017). Use of powered mobility for a young adult with profound and multiple learning disabilities : A practice analysis. *British Journal of Occupational Therapy*, *80*(8), 517-520. https://doi.org/10.1177/0308022617698169
2) Kenyon, L. K., Farris, J., Brockway, K., Hannum, N., & Proctor, K. (2015). Promoting Self-exploration and Function Through an Individualized Power Mobility Training Program. *Pediatric Physical Therapy*, *27*(2), 200-206.

https://doi.org/10.1097/PEP.0000000000000129

3) Mountain, A. D., Kirby, R. L., Smith, C., Eskes, G., & Thompson, K. (2014). Powered Wheelchair Skills Training for Persons with Stroke : A Randomized Controlled Trial. *American Journal of Physical Medicine & Rehabilitation*, *93*(12), 1031-1043. https://doi.org/10.1097/PHM.0000000000000229

Presenter biography

Alice Pellichero is an occupational therapist. At the beginning of her career she worked in France in rehabilitation centers is neurology services with adults. She is currently conducting a clinical research project as part of the doctoral program in clinical and biomedical sciences at Université Laval (Québec City, Canada). She is attached to the Interdisciplinary Research Center for Rehabilitation and Social Integration (CIRRIS) and is under the direction of Dr. François Routhier (CIRRIS), Dr. Krista Best (CIRRIS) and Dr. Eric Sorita (Bordeaux University). The aim of her research project is to enhance powered mobility device provision through better assessment and training. Realization of this research will lead to the development of a novel PWC driving program that may improve access to PWC mobility for individuals who may have otherwise been excluded. In turn, successful PWC mobility could improve participation and quality of life for the individuals.

E14: Permobil Platinum Plus Sponsor's session:

Understanding the Design of Manual Wheelchairs from an Engineer's Perspective.

Presenter Biography

Samuel Baker (B.Eng., MIEAust) is part of the Permobil APAC team in the role of Product Manager, specialising in Manual Wheelchairs and Power Assist Devices. Trained as a medical engineer with further studies in biorobotics, he started his career in the hospital and government setting before joining the assistive technology industry in 2015. Previous roles have included business development manager and product specialist where he developed a broad range of knowledge and passion for training and education.
Equally happy being hands on with products, past career highlights have included the opportunity to provide technical support for athletes at global para-sports events such as the Commonwealth and Invictus Games.
Outside of work Sam enjoys hiking, pulling things apart to figure out how they work, martial arts, and spending time with friends and family.

E15: Use of activity chairs/standing aids by people with disabilities: results from a Master thesis.

Naja Tidemann[1,2], Ph.D. Erika G. Spaich[1]
[1]Neurorehabilitation systems group, Department of Health Science and Technology, Aalborg University, Aalborg, Denmark. [2]VELA - Vermund Larsen A/S, Aalborg, Denmark
Naja Tidemann, PhD student
Ph.D. Erika G. Spaich, Associate Professor

Learning objectives

1. Have knowledge of the purpose of the activity chair and the standing aid.
2. Describe areas of use of the activity chair and the standing aid as well as the benefits of using these assistive technologies when performing activities of daily living by people with disabilities.
3. Discuss the users' satisfaction with these assistive technologies.

Abstract

Background: In Denmark 750,000 adults live with varying degrees of limited functionality due to mobility impairments. Municipalities grant them large quantities of assistive technologies, including activity chairs and standing aids, to alleviate the consequences of their impairments (1,2). The purpose of the activity chairs and standing aids is to improve the mobility and enhance the capability of the users to engage independently in activities of daily living.

Objective: To investigate the areas of use of the activity chair and the standing aid as well as the impact of using them when performing activities of daily living by people with disabilities living at home. Furthermore, to evaluate the level of user satisfaction.

Methods: Empirical data was collected from 22 users with two standardized research tools. IPPA (3,4) was used to gather information regarding the areas of use and the difficulty to perform activities of daily living from five users and part A of QUEST 2.0 (5, 6, 7) was used to evaluate user satisfaction by 17 other users.

Results: Regarding the areas of use, the activity chair and the standing aid were used in relation to 13 activities, among them cooking at the kitchen table, emptying and filling the dishwasher and the washing machine, and taking food in and out of the refrigerator. There was an overall improvement of the IPPA score when using these two assistive technologies during 2-4 weeks (20,83 [20 – 21] score before; 11 [10 – 11,25] score after, expressed as median [25 % - 75% quartiles]). Users ranked the level of satisfaction with the activity chair and the standing aid between satisfied and very satisfied.

Conclusion: The activity chair and the standing aid had a positive impact on helping users in their activities of daily living, which resulted on them being satisfied or very satisfied with their assistive technology.

Content references:

1) Older people's use of powered wheelchairs for activity and participation. Brandt, A., Iwarsson, S. & Ståhle, A., mar. 2004, I: Journal of Rehabilitation Medicine.
2) Mobility devices to promote activity and participation: a systematic review. Salminen, A-L., Brandt, A., Samuelsson, K. A. M., Töytäri, O. & Malmivaara, A., sep. 2009, I: Journal of Rehabilitation Medicine.
3) Socialstyrelsen. Dansk IPPA – Et redskab til at afdække aktivitetsproblemer i hverdagen og evaluerer indsatser. November 2013. [Lokaliseret den 9. juni 2020] Tilgængelig fra: http://www.etf.dk/sites/default/files/uploads/public/documents/Redskaber/dansk_ippa_pdfa2a_2_reviderede_udgave.pdf

4) Assistive technology self-management intervention for older Hispanics: a feasibility study. Orellano-Colón, E.M. et al. Disability and Rehabilitation: Assistive Technology. 2020. ISSN: 1748-3107
5) QUEST 2.0 – et redskab til måling af brugertilfredshed med hjælpemidler. Hjælpemiddelinstituttet. April 2002. [Lokaliseret den 18. oktober 2019] Tilgængelig fra: https://socialstyrelsen.dk/udgivelser/quest-2.0
6) The Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0): An overview and recent progress. Demers, L., Weiss-Lambrou, R., Ska, B. Research Center of the Institut universitaire de geriatrie de Montreal, Canada. Technology and Disability 14 (2002) 101-105
7) Mobility-related participation and user satisfaction: construct validity in the context of powered wheelchair use. Brandt, A., Kreiner, S. & Iwarsson, S., feb. 2010, I: Disability and Rehabilitation: Assistive Technology.

Presenter biography

Naja Tidemann (ntj@hst.aau.dk) has a bachelor degree in Occupational Therapy from University College of Northern Denmark (UCN) from 2014 **and a** MSc in Clinical Science and Technology from Aalborg University from 2017. She is currently employed at VELA – Vermund Larsen A/S and is enrolled as a PhD student at Aalborg University - Department of Health Science and Technology, Denmark. Her research interest is in the field of assistive technology and is currently working on a research project concerning effect measurements of activity chairs for people with disabilities.

E16: Tales from the field: My love affair with smart electronics.

Ms Jenni Dabelstein
Gizmo Rehabilitation, Brisbane, Australia,
Physiotherapist/Complex AT Prescriber

Learning objectives

1. Identify 3 key factors that indicate when smart electronics may enhance power wheelchair function and/or safety for power wheelchair users or carers.
2. Understand 3 clinical applications of smart electronics to enhance clinical outcomes.
3. Be able to utilise processes at assessment and fitting, to effectively prescribe and integrate smart electronic functions.

Abstract

Over the past 5 years, it has become much more common to prescribe power wheelchairs with multiple power seating functions, including tilt-in-space, backrest recline, legrest elevate and seat elevate. Hardware and software options are available that allow users even with severe physical impairments to both drive a power wheelchair and access power seating functions. The benefits of self-determination in mobility are now accepted as wide reaching, so shared control and supervised driving scenarios are also becoming more common. However, with complexity of power wheelchairs functions comes complexity of chair operations, which can make generating consistent and positive clinical outcomes more challenging.

My own experience is that, while complex power wheelchairs potentially offer incredible functionality, in practice they can be somewhat intimidating and overwhelming. This is particularly the case for users with any degree of cognitive impairment, where the use environment is often quite risk-averse and any mishaps may result in reduced opportunities for self-drive. Fortunately, in tandem with proliferation of advanced power wheelchair functions has come an array of smart electronic features that simplify operations and enhance safety. These include through-drive controls, memory seating, programmable smart actuators, both automatic and programmable safety features and advanced programming options. In my own clinical practice, I have fallen a little in love with smart electronics and regularly use smart features and programming to simplify operations for users and carers, and help to generate more consistently positive clinical outcomes. In this presentation I will explore some smart electronic features that I use regularly to make chair operations easier, simpler and safer for users and carers alike.

Content references:

1) Dicianno, B.E., Lieberman, J., Schmeler, M.R., Schuler P. Souza, A.E., Cooper, R., Lange, M., Liu, H., & Jan, Y.K. (2015). RESNA position on the application of tilt, recline, and elevating legrests for wheelchairs literature update. Retrieved from http://www.resna.org/sites/default/files/legacy/resources/position-papers/RESNA%20PP%20on%20Tilt%20Recline_2015.pdf
2) Frank, A.O., De Souza, L.H., Frank, J.L., & Neophytou, C. (2012). The pain experiences of powered wheelchair users. Disability and Rehabilitation, 34, 770-778. Available from https://pubmed.ncbi.nlm.nih.gov/22013954/
3) Mortenson WB, Hammell KW, Luts A, Soles C, Miller WC. (2015) The power of power wheelchairs: Mobility choices of community-dwelling, older adults. Scand J Occup Ther. 2015;22(5):394-401. doi:10.3109/11038128.2015.1049289 Available from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4818588/

Presenter biography

Jenni Dabelstein is a Physiotherapist who works exclusively as a prescriber and consultant in the area of prescribing complex assistive technology. Her special interests include biomechanics, specialised seating and all types of wheeled mobility, including sports wheelchairs. Jenni has worked within the disability sector for over 3 decades, in a great variety of roles, including clinical, research, consultancy, education and business roles. She has a depth of knowledge and experience regarding specialised equipment and the industry that surrounds it, as well as a range of formal qualifications. Jenni strives to bring formal assessment together with theory and practical knowledge in order to generate positive outcomes for her clients via the latest assistive technology. As well as running her busy private consultancy, Jenni is a current Board member of ARATA and a National Classifier in the Paralympic sport of Boccia, and continues to present regularly at industry workshops, seminars and conferences.

A13: Supporting the growth and development of wheelchair and seating therapists: a coaching approach

Mrs Maria Whitcombe-Shingler, Ms Alexandra Haydon
ADHB, Auckland, New Zealand
Mrs Maria Whitcombe-Shingler, Educator
Ms Alexandra Haydon, Wheelchair & Seating Therapist

Learning objectives

1. Have been introduced to coaching tools and techniques used to facilitate growth and development of wheelchair and seating therapists
2. Learn and apply the GROW model of coaching
3. Practical tips for effective coaching sessions.

Abstract

From novice to expert, the journey of wheelchair and seating training can be a long and challenging journey. This session will be offering participants the opportunity to learn about coaching principles, models and tips, and the lived experience of applying these. As clinicians in a field with increasing demand and funding complexities, the need to work effectively to achieve positive outcomes for our clients whilst avoiding feeling overwhelmed and frustrated was recognised.

The use of mentoring as opposed to preceptoring and the use of a coaching model in conjunction with other models of training and supervision has been effective in building skill and confidence. The learning with these approaches could be useful to other services. Supporting and valuing individual team members, understanding the client population and context, and focussing on client outcomes have led to a focus on coaching, support and empowerment. This is alongside enabling therapist participation in the New Zealand wheeled mobility and postural management competency framework training, tasks, and formal case studies.

The essential components of effective coaching using the GROW coaching model can be a powerful catalyst for change. With therapists on the ground identifying the possible solutions, success can come from listening, exploring and supporting ideas in a structured and safe framework.

Content references:

1) D'ANTONI, A. et al. (2019). An Evidence-Based Approach to Learning Clinical Anatomy: A Guide for Medical Students, Educators, and Administrators. Retrieved from https://onlinelibrary.wiley.com/doi/epdf/10.1002/ca.23298
2) Falzarano, F., Pinto Zipp, G. (2012). Perceptions of mentoring of full-time occupational therapy faculty in the United States. Retrieved from https://onlinelibrary.wiley.com/doi/epdf/10.1002/oti.1326
3) Ministry of Health, New Zealand Government. (2016). Competency framework: Wheeled mobility and postural management. Retrieved from https://www.seatingtogo.co.nz/assets/Uploads/Competency-Framework-Wheeled-Mobility-and-Postural-Management-March-2016.pdf
4) Ministry of Health, New Zealand Government. (2016). Disability Support Services DSS1025 Wheeled Mobility and Postural Management (Seating) Assessment Services Tier Two Service Specification. Retrieved from https://www.health.govt.nz/system/files/documents/pages/dss1025-wheeled-mobility-postural-management-seating-assessment-services-oct16.pdf

Naidoo, N. (2006). The role and importance of mentoring in physiotherapy.

5) South African Journal of Physiotherapy, 62,3, p.154. Retrieved from https://doi.org/10.4102/sajp.v62i3.154

Presenter biography

Maria Whitcombe-Shingler graduated as an occupational therapist from CIT, Upper Hutt. She has worked in a range of hospital school and community settings and has clinical, teaching and supervisory experience. She has worked at Mobility Solutions since its inception in 2000. Maria is a reflective practitioner, and completed her Masters research (Otago Polytechnic) using qualitative methodology to look at adult users' experiences and perspectives of using multifunction power wheelchairs in Aotearoa, New Zealand.

Alexandra Haydon graduated from the Auckland University of Technology in 2018 with a Bachelor of Health Science Majoring in Occupational Therapy. After graduating, Alex gained experience in adult community occupational therapy, before joining Mobility Solutions in 2021 on a rotational programme.

A14: Can user centered design be used to develop assistive technology? Testing a framework for collaboration

Miss Hana Phillips, Associate Professor Gianni Renda, Professor Rachael McDonald
Swinburne University, Melbourne, Australia
Miss Hana Phillips, Occupational Therapist

Learning objectives

1. For participants to be exposed to current design methodologies and how these may run in parallel with current practices within both healthcare and with development of assistive technologies
2. For participants to experience current design methodologies and trial a collaborative framework in a safe space
3. For participants to have an opportunity to reflect on their own practices and the proposed framework and whether they can see the benefits of further interdisciplinary practice to start conversations for further interdisciplinary opportunities and gaps in the research.

Abstract

Introduction: There is growing evidence that there is a need for change in the approach to Assistive technology (AT), to reduce the levels of abandonment in the community and improve quality of life for the users of AT. Alongside this, healthcare professionals are interacting with design professionals to solve complex issues within healthcare on an increasingly frequent basis. Examples of this include areas of oncology, hospital design and dementia care. However, there has been limited research into human centered design with the collaboration of users of AT, health care professionals and designers. As there is growing evidence that collaboration between the users of AT, as well as health care professionals and design professionals utilising a human and user centered design approach may be of benefit to the users of AT and reduce the abandonment of AT.

Method: To further engage with this topic, users of AT, healthcare professionals and designers have participated in research to understand the current understandings of human centered design and collaboration in this space of AT design and inter-professional practices. This data was then used to formulate a framework to implement user and human centered design within the field of AT. This framework was developed to address the areas of difficulty presented and to mitigate these issues. This framework will be demonstrated and run as a pilot to ensure it's suitability prior to being used within the community.

Result: After trialing of this methodology, it will be adapted and used within the community to provide a use case for the interdisciplinary collaboration of users of AT, designers and healthcare professionals. This will assist in both understanding the potential role of human centered design in the area of AT and promoting the interactions between user centered and client centered practice within the AT community.

Content references:

1) De Couvreur, Lieven, Walter Dejonghe, Jan Detand, and Richard Goossens. "The Role of Subjective Well-Being in Co-Designing Open-Design Assistive Devices." *International Journal of Design* 7, no. 3 (2013): 57-70.
2) Merino, Giselle Schmidt A, Renata Hinnig, Arina Blum, Susana Domenech, and Eugenio AD Merino. "Design Management Contributions in the Diagnosis of a Psychiatric Hospital in Brazil: Identifying Opportunities in Assistive Technology." Paper presented at the International Conference on Applied Human Factors and Ergonomics, 2017.

3) Wagenfeld, Amy, Lori Reynolds, and Tamar Amiri. "Exploring the Value of Interprofessional Collaboration between Occupational Therapy and Design: A Pilot Survey Study." *The Open Journal of Occupational Therapy* 5, no. 3 (2017): 2.

Presenter biography

Hana Phillips: Hana's has a background in Occupational Therapy and rehabilitation, with an interest in adults and disability. With broad experience within the public and private health sectors, her interests include adaptive technology and environmental design and modification. This lead to working on a PhD in understanding how design principles, specifically user centred design and design thinking may improve the utility of aids and improve personal independence as well as decrease long term abandonment.

Gianni Renda: Associate Professor Gianni Renda is Deputy Chair of the Department of Architectural and Industrial Design. His research focus is investigating ways that design can empower the user in the field of health, disability and ageing. Other interests include food design, advanced manufacturing, Italian design history and automotive design. Gianni has worked professionally as a graphic designer, retoucher, printer, exhibition and set designer.

Rachael McDonald: Associate Professor Rachael McDonald is a clinical, research and teaching Health Professional with an interest in enabling people with lifelong disabilities to participate in life situations. She has worked extensively in this field, with in both children's services and adult settings. She supervises research (honour's, MSc and PhD) students specialising in the care of people with complex disability as well as development and evaluation into the effectiveness of assistive technologies, and has published widely. She has qualifications in occupational therapy, biomechanics and higher education in addition to her Doctorate which was an exploration of the acceptability and effectiveness of adaptive seating systems in wheelchairs for children with cerebral palsy. She previously held a joint appointment with the Department of Occupational Therapy and the Centre for Developmental Disability Health Victoria at Monash University. Her role at CDDHV included health professional education and leading research activities, whereas her interest in using technology as an enabler but also as a tool for collecting objective evidence was a feature of her occupational therapy research. This interest has led to her recent appointment as the Chair, Department of Health and Medical Science at Swinburne University of Technology, where this research is developing further.

B11: Permobil Platinum Plus Sponsor Session:

Smart Drive: New Updates and their Clinical Applications

Presenter Biography

Samuel Baker (B.Eng., MIEAust) is part of the Permobil APAC team in the role of Product Manager, specialising in Manual Wheelchairs and Power Assist Devices. Trained as a medical engineer with further studies in biorobotics, he started his career in the hospital and government setting before joining the assistive technology industry in 2015. Previous roles have included business development manager and product specialist where he developed a broad range of knowledge and passion for training and education.
Equally happy being hands on with products, past career highlights have included the opportunity to provide technical support for athletes at global para-sports events such as the Commonwealth and Invictus Games. Outside of work Sam enjoys hiking, pulling things apart to figure out how they work, martial arts, and spending time with friends and family.

Rachel Fabiniak began her studies at The Georgia Institute of Technology, where she graduated with her Bachelor of Science in Biology in 2009. Rachel then went on to receive her Doctorate in Physical Therapy from Emory University in 2013.

After receiving her doctorate, Rachel went into clinical practice as a physiotherapist in the Spinal Cord Injury Day Program at Shepherd Center in Atlanta, Ga. There she developed a passion for seating and mobility which ultimately led to her career with Permobil in 2018. In 2020, Rachel became Director of Clinical Education for Asia-Pacific.

B12: Get me out of here, Manual Wheelchair Power add on Devices

Mr Mitchell Stone
Sunrise Medical, Sydney, Australia, Product specialist

Learning objectives

1. Have a good understanding of considerations regarding add on devices.
2. Be able to establish various options available in regards to features and considerations of each
3. Have increased confidence which may help decide which product is going to be suitable for the end user

Abstract

This highly engaging workshop will describe the diverse equipment available to manual wheelchair users to get out in the community. We'll also discover what add on devices make it possible to visit places that would otherwise be too difficult to access. The workshop will cover options that can be attached to a user's manual wheelchair, what to look out for when scripting these products and restrictions that may apply to both the wheelchair and add on devices. Benefits of the use of power add on devices will be covered as well as how it can help users interact in the community; getting them out and about without the fear of being "stuck".

Products available on the market, such as Smart Drive, Smoov, Freewheel, Front Wheel, Batec, F55, Street Jet, Claxon, Tri-Ride, Extender, I-Express, E-fix, E-motion will be reviewed including their and unique applications and benefits.

Content references:

1) Kloosterman, M., Snoek, G., van der Woude, L. and Rietman, J., 2012. A systematic review on the pros and cons of using a pushrim-activated power-assisted wheelchair. *Clinical Rehabilitation,* 27(4), pp.299-313.A systematic review on the pros and cons of using a pushrim-activated power-assisted wheelchair
2) Levy, C., Buman, M., Chow, J., Tillman, M., Fournier, K. and Giacobbi, P., 2021. *Use of Power Assist Wheels Results in Increased Distance Travelled Compared with Conventional Manual Wheeling*. [online] Academia.edu. Available at:<https://www.academia.edu/1333118/Use_of_power_assist_wheels_results_in_increased_distance_traveled_compared_with_conventional_manual_wheeling> [Accessed 8 April 2021].Charles E. Levy, M.D.,[1,2] Matthew P. Buman, Ph.D.,[3] John W. Chow, Ph.D.,[4] Mark D. Tillman, Ph.D.,[5] Kimberly A. Fournier, Ph.D.,[6] and Peter Giacobbi, Jr, Ph.D.[7]
3) Fomiatti,R., Richmond, J., Moir, L. and Millsteed, J., 2013. A Systematic Review of the Impact of Powered Mobility Devices on Older Adults' Activity Engagement. *Physical & Occupational Therapy In Geriatrics*, 31(4), pp.297-309

Presenter biography

Mitch Stone joined Sunrise Medical at the start of 2021 as the RGK product specialist. He has a passion for maximising function and skills for both new and old wheelchair users. He knows the difference a millimetre can make in a perfect set up. Mitch has been a manual wheelchair user since 2010 and brings a breadth of both practical and technical experience to his role. Prior to joining the assistive technology industry, Mitch work in the trade industry where millimetres also made a difference.

Mitch plays both basketball and wheelchair rugby league. He has represented Australia in the League competition and is striving to play on the international stage again in 2021. His skills on the court provide him with an expert

insight and understanding the essential needs when scripting elite chairs for athletes.

Mitch enjoys mentoring and upskilling wheelchair users, helping them to maximise their daily function and participation both in the community and on the field.

C13: The measurement of postural asymmetry in non-ambulant adults with cerebral palsy

CHOLMES[1,2],
[1]Monash University, Peninsula Campus, Melbourne, Australia; [2]St. Vincent's Hospital Melbourne,
Melbourne, Australia

Learning objectives:

Upon completion of this session participants will be able to:

1. Identify factors impacting postural asymmetry and lifespan care in non-ambulant adults with cerebral palsy
2. Understand the use of the Goldsmith Indices of Body Symmetry in the measurement of postural asymmetry of the thoracic cage, pelvis and hips
3. Understand the interpretation of GIofBS results and the significance for postural monitoring and therapeutic interventions

Abstract

Postural deformities affecting the spine, pelvis and hips are common in non-ambulant adults with cerebral palsy (CP). Despite the relatively static nature of CP, the postural asymmetries in CP are noted to be progressive affecting many domains of health and functioning. Secondary impairments are common in the more severely affected adults with complex disabilities with the effects of ageing and functional decline occurring earlier in adults with CP than the general population.. Consistent and reliable clinical measurement of posture and the impact of interventions is challenging, with radiographic studies proving difficult for those with contractures and/or behavioural or movement disorders. The Goldsmith Indices of Body Symmetry (GIofBS) is a simple clinical measurement tool which captures quantitative objective data of rib cage shape, pelvic alignment and hip orientation providing a three-dimensional understanding of the rotary nature of these asymmetries. The GIofBS, using customised measurement apparatus, captures the segmental inter-relationships of the thoracic cage, pelvis and hips, thus providing a clinical approach to aid in problem solving complex seating and bed positioning requirements. Issues related to the progression of postural asymmetry of the thoracic cage, pelvis and hips will be discussed using a case study to highlight the utility of the GIofBS. Objective measurement of postural asymmetry using the GIofBS will be demonstrated providing a practical overview of the process. Videos demonstrating use of the tool with a young adult with a complex disability will further enhance understanding of the measurement process inclusive of clinical interpretation of the results.

Content references

References

1) Tosi LL, Maher N, Moore DW, Goldstein M, Aisen ML. Adults with cerebral palsy: a workshop to define the challenges of treating and preventing secondary musculoskeletal and neuromuscular complications in this rapidly growing population. Dev Med Child Neurol. 2009;51(supplement):2-11.
2) Haak P, Lenski M, Cooley Hidecker M, Li M, Paneth N. Cerebral palsy and aging. Dev Med Child Neurol. 2009;51(04):16-23.
3) Morgan P, Enticott J, Nikam R, Tracy J. Profile of hospital admissions for adults with cerebral palsy: a retrospective cohort study. Dev Med Child Neurol. 2020.
4) Bromham N, Dworzynski K, Eunson P, Fairhurst C. Cerebral palsy in adults: summary of NICE guidance. BMJ. 2019;364:l806.
5) Holmes C, Brock K, Morgan P. Postural asymmetry in non-ambulant adults with cerebral palsy: a scoping review. Disabil Rehabil. 2018;41(9):1-10.
6) Goldsmith E, R. G, R. G, W. M. A technique to measure windswept deformity. Physiotherapy. 1992;78(4):235-242.

7) Holmes C, Fredrickson E, Brock K, Morgan P. The intra and inter-rater reliability of the Goldsmith Indices of Body Symmetry in non-ambulant adults with cerebral palsy. Disabil Rehabil. 2020.
8) Simple Stuff Works. Anatomical Measuring Instrument Goldsmith Indices of Body Symmetry 2018; http://www.measurepositionprotect.com. Accessed 1 Jan 2018, 2018.
9) Holmes C, Kim Brock & Prue Morgan (2020): Progression of Postural Asymmetry in Young Adults with Cerebral Palsy who are Non-ambulant: An exploratory study, Pediatric Physical Therapy, In Press, DOI: 10.1097/PEP.0000000000000787
10) Ryan JM, Peterson MD, Ryan N, Smith KJ, O'Connell NE, Liverani S, et al. Mortality due to cardiovascular disease, respiratory disease, and cancer in adults with cerebral palsy. Developmental Medicine & Child Neurology. 2019;0(0).
11) Rodby-Bousquet E, Czuba T, Hagglund G, Westbom L. Postural asymmetries in young adults with cerebral palsy. Developmental Medicine & Child Neurology. 2013;55(11):1009-15.
12) Casey J, Rosenblad A, Rodby-Bousquet E. Postural asymmetries, pain, and ability to change position of children with cerebral palsy in sitting and supine: a cross-sectional study. Disability and Rehabilitation. 2020:1-9.
13) Holmes C, Kim Brock & Prue Morgan (2021): The relationship between radiographic and anthropomorphic measurements of deformity of the thorax, hips and pelvis in adults with cerebral palsy. New Zealand Journal of Physiotherapy, In Press, DOI: 10.15619/NZJP/49.1.03
14) Peterson MD, Gordon PM, Hurvitz EA. Chronic disease risk among adults with cerebral palsy: the role of premature sarcopoenia, obesity and sedentary behaviour. Obesity Reviews 2013;14:171-82.

Presenter biography

Carlee Holmes is the senior physiotherapist in the Young Adult Complex Disability Service (YACDS) at St. Vincent's Hospital Melbourne and also works in private neurological practice. The YACDS is a transition service from paediatric to adult healthcare for young adults with complex medico physical disabilities including cerebral palsy.
Carlee has a particular interest in the measurement of postural asymmetry in non-ambulant adults with cerebral palsy and is currently completing a PhD investigating "Assessment and Management of the common postural characteristics in young adults with Cerebral palsy". She has also gained additional certification in Postural Care and Measurement of Body Symmetry.

Carlee is a research associate for CP Achieve and involved in the consumer working group. She is also a member of the American Academy for Cerebral Palsy and Developmental Medicine Lifespan Care Committee

C14: Night- time positioning: Systematic approach to successful outcomes.

Joana Santiago
Medifab, Sydney, Australia
Clinical Education

Learning objectives

Upon completion of this session, participants will be able to:

1. Identify three physiological side effects of immobility common in people with disabilities
2. Identify three potential issues that can be addressed by supported lying positions at night
3. Describe three potential benefits of promoting supported supine lying in clients with complex needs
4. List three potential risks factors that need to be addressed for successful and safe outcomes

Abstract

People of all ages, who have a motor impairment or movement disorder, are at higher risk of developing postural deformities. Prolonged postures can be dangerous for any individual, however, for those who find it hard to change position, these may result in contractures and ultimately in structural deformities with life threatening consequences.

An intermediate level workshop analysing the negative effects that unsupported lying can have on clients with movement disorders. Evidence-based research suggests that preferred postures adopted in lying are greatly associated with postural deformities observed in sitting. Based on that, we will support clinicians with a systematic assessment process and will provide practical strategies for a successful intervention and implementation plan.

This is a great opportunity for everyone who wants to enhance their confidence and clinical reasoning skills in determining the optimal posture and functional requirements for their clients based on a 24-hour posture care management approach.

Content references:

1) Ágústsson, A., Sveinsson, T., Pope, P., Rodby-Bousquet, E. (2018). *Preferred posture in lying and its association with scoliosis and windswept hips in adults with cerebral palsy*. Disability and Rehabilitation. 41: 3198-3202
2) Casey, J., Rosenblad, A., Rodby-Bousquet, E. (2020). *Postural asymmetries, pain, and ability to change position of children with cerebral palsy in sitting and supine: a cross-sectional study.* Disability and Rehabilitation. 1-5
3) Hill, S., Goldsmith, J. (2010*). Biomechanics and Prevention of Body Shape Distortion.* The Tizard Learning Disability Review. 15(2):15-29.
4) Holmes, C., Brock, L., Morgan, P. (2019). *Postural asymmetry in non-ambulant adults with cerebral palsy: a scoping review.* P. Disabil Rehabil. 41(9): 1079-1088.
5) Humphreys, G., King, T., Jex Jo, et al. (2019). *Sleep positioning systems for children and adults with a neurodisability: A systematic review.* 82 (1): 5-14
6) Sato, H. (2020). *Postural deformity in children with cerebral palsy: Why it occurs and how is it managed*. Phys Ther Res. 23(1): 8-14
7) Stephens, M., Bartley, C., Priestly, C. (2018). *Evaluation of Night Time Therapeutic Positioning for Adults with Complex Postural Problems*. Salford: University of Salford, 1-61

Presenter biography

Joana Santiago is the Clinical Educator Manager and the R&D Clinical Lead for

Medifab. She completed her degree in Occupational Therapy in Portugal and soon developed a passion for Posture Care and Wheelchair Seating & Positioning. With 15 years of experience, predominantly dealing with clients with complex postural needs, Joana takes pride in her flexible capability in reaching good clinical outcomes by considering the individual needs, wants and expectations of those she works with. Joana is based in Australia where she primarily assists clinicians by sharing her knowledge and expertise through education and mentoring programs. Furthermore, she has a positive influence on the development, supply, and training of Medifab's extensive range of products.

She is a specialist in her field and has presented at a variety of national and international conferences around the World.

D16: Permobil Platinum Plus Sponsor's Session:

Introducing the New ROHO Hybrid Select

Terri Davies,
Product Manager – APAC, Permobil, New Zealand
Rachel Maher
Clinical Educator, Permobil, New Zealand

Presenter Biography

Terri Davies graduated from Brigham Young University in 2013 with a Bachelor of Science in Public Health having previously received her Associate of Science in Physical Therapy Assistant in 2010. Terri is currently completing her Master's in Applied Management.
Terri found her passion for Neuro while working in a non-profit Neuro clinic for three years and spent a year as a travelling therapist in the USA where she fell in love with wounds and realised her passion for pressure injury prevention.
Terri has worked for Permobil for 5 years in numerous roles including leading the New Zealand Rental Division as National Rental Services Manager and more recently National Business Development Manager. Terri started as Product Manager for APAC in January 2022.

Rachel Maher graduated from the University of Otago in 2003 with a Batchelor of Physiotherapy, and later gained her Post Graduate Diploma in Physiotherapy (Neurorehabilitation) in 2010.

After graduating, Rachel gained experience in inpatient rehabilitation and community Physiotherapy, before moving into a Child Development Service, working with children aged 0 to 16 years.

Rachel developed a passion for seating and mobility while working children, recognising the value of a team approach to wheelchair and seating provision to achieve the best outcomes for end users.

Rachel later moved into a Wheelchair and Seating Outreach Advisor role at Enable New Zealand in 2014, complementing her clinical knowledge with experience in NZ Ministry of Health funding processes.

Rachel joined Permobil in June 2020 and is passionate about education and working collaboratively to achieve the best result for our end users.

E17: Listening to their voices: Children's and families' perspectives of power mobility use

Dr. Lisa K. Kenyon
Grand Valley State University, Grand Rapids, USA
Professor

Learning objectives

At the completion of this educational session, attendees will be able to:

1. Discuss 3 ways in which children's perspectives of power mobility intervention could be incorporated into a pediatric power mobility intervention plan.
2. Discuss 3 ways in which parent's/caregivers' perspectives of power mobility use may evolve over time.
3. Compare and contrast 3 factors influencing procurement and use of power mobility devices.
4. Explain 3 ways in which these children's and families' perspectives can be applied to enhance our daily practice.

Abstract

Power mobility use can have a life-changing impact on children and their families. The influence of power mobility use on children's play skills, psychosocial skills, and interpersonal/peer relationships is well documented in the literature. Children's use of power mobility also has been found to positively impact the attitudes of others towards children with disabilities, and in some cases, changes how other people view the abilities of children with mobility limitations. Despite these documented benefits, understanding children's and families' perspectives of power mobility use may provide additional insights into how these user groups see, judge, and perceive power mobility devices. This session will involve listening to the voices of >75 children and parents/caregivers (20+ children and 55+ parents/caregivers) as they describe their experiences, concerns, joys, and sorrows related to children's power mobility use. Voices will include children who use a powered wheelchair and their parents/caregivers, children who use a powered wheelchair standing device and their parents/caregivers, and parents/caregivers of children who are exploratory or operational power mobility learners who are unable to speak for themselves. Through these voices, we will explore user perspectives and experiences on power mobility device use, power mobility intervention methods, factors influencing procurement of power mobility devices, and personal/environmental factors influencing everyday power mobility device use. These perspectives and experiences will be further examined within the context of existing research findings to consider interconnections amongst self, family, technology, and other people across time and place. Finally, we will reflect on how the perspectives of these children and families can be applied to enhance our daily practice.

Content references:

1) Livingstone R, Field D. Systematic review of power mobility outcomes for infants, children and adolescents with mobility limitations. *Clin Rehabil*. 2014; 28: 954–64.
2) Field D, Livingstone R. Power mobility skill progression for children and adolescents: a systematic review of measures and their clinical application. *Dev Med Child Neurol*. 2018;60(10):997-1011.
3) Kenyon LK, Harrison KL, Huettner MK, Johnson SB, Miller WC. "Stand-on-demand': a qualitative study exploring stakeholder perspectives of pediatric powered wheelchair standing devices. *Dev Med Child Neurol*. In press. Available in advance on-line as of 19 February 2021 at: https://onlinelibrary-wiley-

com.ezproxy.gvsu.edu/doi/epdf/10.1111/dmcn.14842.
4) Kenyon LK, Blank K, Meengs J, Schultz AM. “Make it fun”: a qualitative study exploring key aspects of power mobility interventions for children. *Disabil Rehabil Assist Technol*. In press. Available in advance on-line at: https://www.tandfonline.com/doi/abs/10.1080/17483107.2020.1849431?journalCode=iidt20.
5) Kenyon LK, Aldrich NJ, Farris JP, Walenta K, Chesser B. Exploring the effects of power mobility training on parents of exploratory power mobility learners: a multiple baseline single subject research design. *Physiother Can*. 2021;73(1):76–89.
6) Kenyon LK, Farris JP, Aldrich NJ, Usoro J, Rhodes S. Changes in EEG activity in response to power mobility training: a pilot project. *Physiother Can*. 2020;72(3):260–270.
7) Kenyon LK, Mortenson WB, Miller WC. “There is power in mobility”: parent and therapist perspectives of the experiences of children learning to use power mobility. *Dev Med Child Neurol*. 2018;60(10):1012-1017.
8) Kenyon LK, Farris J, Aldrich N, Rhodes S. Does power mobility training impact a child’s mastery motivation and spectrum of EEG activity? An exploratory project. *Disabil Rehabil Assist Technol*. 2018;13(7):665-673.

Presenter biography

Lisa Kenyon is a Professor in the Department of Physical Therapy at Grand Valley State University in Grand Rapids, Michigan. Dr. Kenyon heads the Grand Valley Power Mobility Project, an inter-professional research and service project that provides power mobility training for infants, toddlers, children and young adults who are not typically considered to be candidates for power mobility use. Dr. Kenyon presents nationally and internationally on topics related to pediatric physical therapist practice and has published multiple peer-reviewed journal articles and book chapters pertaining to power mobility and pediatric topics. Dr. Kenyon currently serves on the Editorial Committee for the Wheelchair Skills Program (Dalhousie University, Halifax, Nova Scotia, Canada) and on the Pediatric Specialty Council of the American Board of Physical Therapy Specialties.

E18: Considerations for Determining Optimal Manual Wheelchair Configuration – what are the "non-negotiables"?

Deb Wilson[1], Sandie Grant[2]
[1]Geneva Healthcare -Seating To Go, Hamilton, New Zealand. [2]Geneva Healthcare - Seating To Go, Tauranga, New Zealand
Deb Wilson, Training Lead
Sandie Grant, Senior Wheelchair & Seating Therapist

Beginner - Intermediate

Learning objectives

Upon completion of this session, participants will be able to:

1. Describe 3 key considerations when configuring a manual wheelchair for an active user
2. Describe 3 adjustments on manual wheelchairs that impact propulsion, transfers and functional stability.
3. Identify 3 "non – negotiable" factors that will become the starting point for scripting a wheelchair for an individual

Abstract

Manual wheelchair design continues to improve as we understand more about the impact of configuration on propulsion efficiency, posture and stability, injury prevention, activity and function. The diverse community of people living with disabilities, and the essence of what an everyday life means for them in their communities, adds to the unique prescription considerations when assessing for a manual wheelchair. There is no formula, and for those who are beginning their journey into the wheeled mobility and seating community, the adjustable capabilities and options available on configurable manual wheelchairs can be overwhelming.

This session will start by introducing key concepts such as centre of gravity, rolling resistance and, rotational inertia that will impact propulsion efficiency and upper limb/shoulder preservation. We will discuss "non-negotiable" factors e.g. transfer technique, decreased ROM, that will inform the starting point from which individual wheelchair configuration will evolve.

Content references:

1) Slavens, B. A. et al (2015). Biomechanics of Pediatric Manual Wheelchair Mobility. Frontiers in bioengineering and biotechnology, 3, 137. https://doi.org/10.3389/fbioe.2015.00137
2) Caspall, J. J., Seligsohn, E., Dao, P. V., & Sprigle, S. (2013). Changes in inertia and effect on turning effort across different wheelchair configurations. Journal of rehabilitation research and development, 50(10), 1353–1362.
3) Koontz AM, Roche BM, Collinger JL, Cooper RA, Boninger ML. (2009) Manual wheelchair propulsion patterns on natural surfaces during start-up propulsion. Arch Phys Med Rehabil ;90:1916-23
4)
5) Requejo PS, Furumasu J, Mulroy SJ. Evidence-based strategies for preserving mobility for elderly and aging manual wheelchair users. *Top Geriatr Rehabil. 2015; 31:26-41*
6) Paralyzed Veterans of America Consortium for Spinal Cord Medicine. Preservation of upper limb function following spinal cord injury: a clinical practice guideline for health-care professionals. *J Spinal Cord Med.* 2005;28 (5):434-470

Presenter biography

Deb Wilson is an Occupational Therapist with over 30 years clinical experience. She is the Training Lead of Seating To Go, part of the Geneva Healthcare Group and a leading

wheelchair and seating assessment, training and repair service in New Zealand.

In 2009, she helped develop the NZ Ministry of Health wheeled mobility and postural management credential for occupational therapists and physiotherapists. She is the NZ Chair for OSS and has contributed to capacity building in the Pacific Islands with Motivation Australia. Deb is currently a member of the ISWP Wheelchair Educators Package Development Group.

Sandie Grant is a Senior Wheelchair & Seating Therapist and training facilitator at Seating To Go, part of the Geneva Healthcare Group, New Zealand. Sandie started working for STG in 2000 and has developed a passion for sharing her knowledge and experience of wheelchair and seating within the organisation and as part of the training team. Sandie started her Occupational Therapy career as a new graduate working in USA in 1992. With a solid grounding working in a large rehabilitation hospital, she then went on to work in a hand clinic, neonatal unit and finally moving back to NZ where she worked as a community OT before joining the STG team 2000. Sandie takes pride in her flexible capability in reaching good clinical outcomes and is passionate about education and working collaboratively to achieve the best result for our end users.

In her spare time she enjoys spending time with her husband and three kids camping, tramping and adventure racing

ABSTRACTS

Thursday 7th April 2022

PLENARY:
Mobility Equity

Jean L. Minkel, PT, ATP

Learning objectives:

Upon completion of this session, participants will be able to:

1. Describe the role of self-generated mobility on a child's cognitive, social and language development.

2. Describe how medical necessity (the medical model) and prior authorizations influences full participation for persons with a long term mobility disability.

3. Describe the 4 points of Stephenson's model to impact systems of injustice.

Presentation description:

I became a therapist because I enjoy working with people and was lucky enough to find a professional passion in working people with long-term mobility disabilities. During my professional career, I (hopefully) have grown and evolved from 'rookie', to 'expert', to 'partner' and now to 'ally'.

During the last two decades, I the privilege of running a wheelchair service designed to meet the needs of persons with mobility disabilities in New York City. Very quickly, I learned I had to listen more and talk less. Through listening, I discovered what people really needed, which is not always what the system was providing. We built a system to provide mobility equity. Mobility equity started by treating our clients as consumers. Our clinic is set up as a showroom, you roll through before you get to a treatment mat. Testing driving and safe spaces to say, 'I don't like it' became common practices. We began a 'back-up' chair program; supporting the repair needs or both a primary and a back-up chair (of any type). If you don't have room to store a back-up in your NYC apartment, we supported a loaner chair program.

In 2019, the state decided we were a 'boutique' program. (A boutique for the poorest, disabled citizens in NYC). Our program was folded into a much larger corporation. Despite being poor and having very little power, our clients fought for the wheelchair service. We were allowed to contract with the corporation and we soon discovered what oppression feels like.

This talk will use Bryan Stevenson's four ways to move toward justice, as a framework to work toward mobility equity. We will examine our clinical practices, public policies, research agendas and technology offerings to uncover systemic inequities toward persons with mobility disabilities. Hopefully, you too, will become not just a caring professional; but a motivated ally.

Content references:

1) Stevenson, B. "Four Ways to Help Bend the Moral Arc of the Universe toward Justice, (Jan., 2017). https://www.educationpioneers.org/blog/four-ways-help-bend-moral-arc-universe-toward-justice (Accessed April 2, 2021).

2) (Cole) Galloway, J.C., Ryu, JC. & Agrawal, S.K. Babies driving robots: self-generated mobility in very young

infants. *Intel Serv Robotics* **1,** 123–134 (2008).

3) McBride, S. “My Quest to fFnd the Right Wheelchair”. *New Mobility (2021) https://www.newmobility.com/2021/03/finding-the-right-wheelchair/*

4) Minkel, Jean L. “Integration of Complex Rehabilitation Technology (CRT) into Long-Term Care Supports: Case Study of Independence Care System’s Seating and Mobility Program and Practices.” *Topics in geriatric rehabilitation* 31.1 (2015): 3–9.

5) Heerkens, Y. F., de Weerd, M., Huber, M., de Brouwer, C. P., van der Veen, S., Perenboom, R. J., ... & van Meeteren, N. L. (2018). Reconsideration of the scheme of the international classification of functioning, disability and health: incentives from the Netherlands for a global debate. *Disability and rehabilitation*, *40*(5), 603-611.

6) Mitra, S., & Shakespeare, T. (2019). Remodeling the ICF. Disability and Health Journal, 12(3), 337–339. https://doi.org/10.1016/j.dhjo.2019.01.008

Presenter biography:

Ms. Minkel is a physical therapist and master clinician well recognized for her work in Assistive Technology. She is currently the Senior Vice President at ICS - Independence Care System, a not for profit, care management agency for persons living with a physical disability in New York City; where she also leads the, *On A Roll* seating clinic. Jean has been an invited keynote speaker at conferences in the US, Canada, Australia, New Zealand and Japan. She is a published author, including many peer reviewed journal articles and most recently, she co-edited, with Michelle Lange, the newly published textbook, Seating and Wheeled Mobility – a Clinical Resource Guide. The A.T. community has recognized Jean for her contributions by awarding to her, the RESNA Fellow award in 1995 and the Sam McFarland Mentor Award in 2012.

A15: Sunrise Medical Gold Sponsor's session:

Quickie Q500 M Mini - Come learn about the ultra-compact power wheelchair that's packed with BIG performance.

Amy Bjornson
Clinical Director
Sunrise Medical, Sydney, Australia

We expect a lot out of our power wheelchairs: driving performance, diverse terrain navigation and comfortable ride - all while being manoeuvrable and easy to drive. The Quickie Q500 M Mini does all this and more. Join us to hear about all its features and clinical applications.

Presenter biography

Amy Bjornson trained as a Physical Therapist in the United States, Amy has over 20 years' experience working with adult and pediatric neurologic populations, with specialties in the treatment of spinal cord injury, and provision of assistive technology for clients with physical challenges.

Based in Sydney, Amy currently develops and implements national and international training programs on using Assistive Technology to enhance inclusion, health and well-being in those with physical disabilities. She also serves a product improvement and development role for Sunrise Medical, Australia.

Amy is a dynamic speaker who has lectured extensively on seating and mobility. She has also traveled to several developing countries, learning and sharing information with their medical communities.

Amy received her ATP certification in 1995, SMS certification in 2015 and Australian Physiotherapy certification in 2018. She is an active member of Wheelchairs for Humanity, Health Volunteers Overseas and offers technology support to Hidden Treasures Home, Fuzhou China

B13: An overview of wheelchair provision education in Canadian occupational therapy programs

Paula Rushton[1], Ed Giesbrecht[2]
[1]University of Montreal, University of Montreal, Canada. [2]University of Manitoba, Manitoba, Canada
Paula Rushton, Associate Professor
Ed Giesbrecht, Associate Professor

Learning objectives

On completion of the presentation, participants will be able to:

1. describe wheelchair education content provided in Canadian university OT programs
2. identify how Canadian curricula maps against the WHO 8-step process
3. discuss strategies to enhance wheelchair-related content in university programs

Abstract

In Canada, occupational therapists (OTs) play a central role in wheelchair service provision. Inadequate training during entry-to-practice professional education has been identified as a major concern worldwide in delivering proper wheelchair service (Fung et al., 2020; Giesbrecht et al., 2021). A survey of 21 Canadian OT and physiotherapy (PT) university programs reported marked variability in delivery of wheelchair skills education to students (Best et al., 2015). To address this issue, we undertook a project to develop a national profile of wheelchair education provision in Canadian university OT curricula and a strategy for addressing identified gaps. Educators from each OT program were invited to participate in the study. Educators from participating universities completed a single site-specific online survey regarding wheelchair service provision education in their curriculum. Survey data were mapped according to the WHO 8-step wheelchair provision process and time committed to teaching each step. Semi-structured interviews were then conducted with participants to confirm and complete the program-specific mapping. Twenty-eight educators from 13 of the 14 Canadian OT programs (93%) were enrolled. Participants ranged in age from 31 to 63 years (48 ± 8 years) and were mostly women (n=23) with full-time faculty member positions (n=15). Only the *Assessment* (mean = 7.2 hours) and *Prescription* (5.7 hours) steps were covered in all programs and were the most comprehensive. *Funding/Ordering* (n=12, 1.4 hours) and *Fitting/Adjusting* (n=11, 1.9 hours) steps were addressed in most programs, but with more limited coverage. About 75% of programs included *Referral* (n=10, 0.9 hours) and *Training* (n=10, 3.8 hours) steps, while just over half incorporated *Product Preparation* (n=7, 1.8 hours) and *Follow-up/Maintenance* (n=7, 1.1 hours) steps. There is considerable variability in the number of curriculum hours, methods of delivery, and methods of evaluation in Canadian OT curricula. Educators articulate multiple barriers to making and implementing curriculum improvements.

Content references:

1) Best KL, Miller WC, Routhier F. A description of manual wheelchair skills training curriculum in entry-to-practice occupational and physical therapy programs in Canada. Disabil Rehabil Assist Technol. 2015; 10(5):401-406.
2) Fung K, Miller T, Rushton PW, et al. Integration of wheelchair service provision education: current situation, facilitators and barriers for academic rehabilitation programs worldwide. Disabil Rehabil Assist Technol. 2020; 15(5):553-562.
3) Giesbrecht E, Carreiro N, Mack C. Improvement and retention of wheelchair skills training for students in entry-level occupational therapy education. Am J Occup Ther. 2021 Jan-Feb;75(1):1-9.

Presenter biography

Ed Giesbrecht began working as an occupational therapist in 1994, developing a particular interest in assistive technology and wheeled mobility, serving as clinical specialist in an Assistive Technology clinic in Winnipeg, Canada. His research interest drew him to academia to pursue a master's and PhD degree. He is an Associate Professor in the department of Occupational Therapy at the University of Manitoba. His research focuses on strategies to address wheelchair mobility skills and training, improving entry-to-practice education, and winter mobility.

Paula Rushton is an Associate Professor in the School of Rehabilitation, Occupational Therapy Program at the University of Montréal and a researcher at the CHU Ste-Justine Research Center. Her research is focused on measurement, intervention, knowledge translation and education related to improving the wheeled mobility of both adults and children through an improved wheelchair service provision process. From the measurement, intervention and knowledge translation perspective, Rushton's expertise lies in the domains of wheelchair skills and wheelchair confidence. From the education perspective, Rushton has been working with the International Society of Wheelchair Professionals to enhance wheelchair content in health care professional university curricula globally.

B14: The design requirements of telehealth wheelchair and seating assessment service for Aotearoa: A mixed methods analysis of stakeholder views.

Dr Fiona Graham[1], Dr Pauline Boland[2], Ms Sally Wallace[1], Ms Bernadette Jones[1], A/Prof Will Taylor[1]
[1]University of Otago, Wellington, New Zealand. [2]University of Limerick, Limerick, Ireland
Dr Fiona Graham, Senior Lecturer
Dr Pauline Bolan, Lecturer
Ms Bernadette Jones, Lecturer
A/Prof Will Taylor, Lecturer

Learning objectives

1. Learners will appreciate the socio-technical and technology acceptance factors influencing uptake of telehealth service design for wheelchair and seating assessment.
2. Learners will gain insight into the perspectives of wheelchair users on current in person wheelchair assessment services in New Zealand and of the potential for telehealth service delivery.
3. Learners will reflect on their own potential use of telehealth, in their current roles as wheelchair user, assessor, manager or service funder.

Abstract

Telehealth is often proposed as a means to improve equity of access to services for those living rurally, and those with complex health or disability needs [1]. COVID19 has seen an unprecedented shift to the use of telehealth internationally. However research evidence on the effectiveness of telehealth remains minimal, particularly for those with complex disability and rehabilitation needs. The presentation demonstrates a robust analysis of the design requirements of a telehealth service from the perspective of multiple stakeholders viewpoint, particularly wheelchair users, and Māori [3,4].

Purpose: To determine the design requirements of a tele-health wheelchair assessment service for key stakeholders in complex wheelchair and seating assessment, with particular attention for Māori.

Methods: Mixed methods using electronic survey, followed by interview and focus groups.

Results: Surveys were completed by 114 stakeholders including wheelchair users, their family members, assessors, technicians and managers. Twenty three assessors and 19 wheelchair users took part in a combination of interviews and focus groups. Telehealth assessment was anticipated to improve service quality, particularly the timeliness of services (52/92, 57%) and prioritisation of the urgency of assessment (71/92, 77%). Māori wheelchair users largely had infrastructure in place for telehealth assessment (10/11, 91%) and held positive expectations of it. Focus groups and interviews with assessors and wheelchair users indicated eight themes highlighting issues with current in-person service delivery, the potential and pitfalls of tele-delivery.

Conclusion: Substantial dissatisfaction with current wheelchair assessment services among wheelchair-users provides context to the successful design of a telehealth assessment service. Training in conducting telehealth wheelchair assessment is needed that incorporates culturally safe communication practices and support of wheelchair-user autonomy while identifying solutions that achieve wheelchair-user goals.

Content references:

1) Sittig DF, Belmont E, Singh H. Improving the safety of health information technology requires shared responsibility: It is time we all step up [Article]. Healthcare. 2018;6(1):7-12.

2) Graham, F., Boland, P., Grainger, R., & Wallace, S. (2019). Telehealth delivery of remote assessment of wheelchair and seating needs for adults and children: A scoping review *Disability and Rehabilitation*. doi:10.1080/09638288.2019.1595180
3) Graham F, Boland P, Jones B, et al. Socio-technical design requirements of a telehealth wheelchair and seating assessment service: A quantitative analysis of stakeholder perspectives. New Zealand Journal of Physiotherapy. in press.
4) Graham, F., Boland, P., Jones, B., Wallace, S., Taylor, W., Desha, L., . . . Grainger, R. (under review). Socio-technical design requirements of a telehealth wheelchair and seating assessment service: A qualitative analysis of stakeholder perspectives. *Disability and Rehabilitation*.

Presenter biography

Fiona Graham is a Senior Lecturer with the University of Otago teaching postgraduate interprofessional rehabilitation. Her research areas include telehealth in rehabilitation, knowledge translation and participation focused interventions, particularly for paediatric populations. She resides in Christchurch, New Zealand.

C15: Postural asymmetries, pain, and ability to change position of children with cerebral palsy

Mrs Jackie Casey[1,2], Dr Andreas Rosenblad[3], Associate Professor Elisabet Rodby-Bousquet[1,4]
[1]Lund University, Lund, Sweden. [2]Belfast Health & Social Care Trust, Belfast, United Kingdom. [3]Uppsala University, Uppsala, Sweden. [4]Centre for Clinical Research, Västerås, Sweden
Mrs Jackie Casey, Advanced Practitioner Occupational Therapist
Dr Andreas Rosenblad , Statistician
Associate Professor Elisabet Rodby-Bousquet, Physiotherapist

Learning objectives

Upon completion of this presentation, participants will be able to:

1. Identify how postural asymmetries are present in children with cerebral palsy across all levels of gross motor skills
2. Describe the associations between having postural asymmetries and the ability to change position in sitting and supine
3. Report the prevalence of pain experienced by these children with cerebral palsy
4. Describe the relationship between having postural asymmetries and having pain

Abstract

Purpose: To examine any associations between postural asymmetries, postural ability, and pain for children with cerebral palsy in sitting and supine positions.

Methods: A cross-sectional study of 2,735 children with cerebral palsy, 0-18years old, reported into the Swedish CPUP registry. Postural asymmetries, postural ability, the gross motor function classification system levels I–V, sex, age and report of pain were used to determine any relationship between these variables.

Results: Over half the children had postural asymmetries in sitting (n= 1,646; 60.2%) or supine (n=1,467; 53.6%) as reported on the Posture and Postural Ability Scale. These increased with age and as motor function decreased. Children were twice as likely to have pain if they had an asymmetric posture (OR 2.1–2.7), regardless of age, sex and motor function. Children unable to maintain or change position independently were at higher risk for postural asymmetries in both supine (OR 2.6–7.8) and sitting positions (OR 1.5–4.2).

Conclusions: An association was found between having an asymmetric posture and ability to change position in sitting and/or lying; and with pain. The results indicate the need to assess posture and provide interventions to address asymmetric posture and pain.

Content references:

1) Ágústsson A, Sveinsson Þ, Rodby-Bousquet E. The effect of asymmetrical limited hip flexion on seating posture, scoliosis and windswept hip distortion. Research in Developmental Disabilities, 2017, 71: 18-23.
2) Alriksson-Schmidt A, Hagglund G. Pain in children and adolescents with cerebral palsy: a population-based registry study. Acta Paediatr. 2016;105(6):665–670.
3) Rodby-Bousquet E, Czuba T, Hagglund G, et al. Postural asymmetries in young adults with cerebral palsy. Dev Med Child Neurol. 2013;55(11):1009–1015.
4) Rodby-Bousquet E, Persson-Bunke M, Czuba T. Psychometric evaluation of the Posture and Postural Ability Scale for children with cerebral palsy. Clinical Rehabilitation, 2016, 30(7): 697-704.

5) Westbom L, Rimstedt A, Nordmark E. Assessments of pain in children and adolescents with cerebral palsy: a retrospective population-based registry study. Dev Med Child Neurol. 2017;59(8):858–863.

Presenter biography

Jackie Casey works as an Advanced Practitioner Occupational Therapist in specialised seating in the Rehabilitation Engineering Centre, a regional service for Northern Ireland. Employed 3 days per week in this service by Belfast Health & Social Care Trust. Here I guide local therapists into interpreting postural assessments into optimal wheelchair seating systems that enable persons with complex physical disabilities and their families (where appropriate) to optimise their ability to independently function, engage in everyday life, and have fun.

Currently studying 2 days/ week on PhD with Department of Clinical Medicine – Orthopaedics, Lund University. Undertaking registry-based research with a population of Swedish children with cerebral palsy (CP) aged birth to 18 years. Primary focus of my research is an exploration of the relationship between postural asymmetries, deformities and contractures, pain, and ability to change position upon supine lying, sitting and independent wheelchair mobility of these children.

C16: Their voices: What caregivers say about sleep systems for their children

Ms Jane Hamer
Rehabilitation Teaching and Research Unit (RTRU), Otago University, Wellington, New Zealand. Waitemata District Health Board (WDHB), Auckland, New Zealand, Paediatric Physiotherapist and Clinical Leader of Physiotherapy, WDHB

Learning objectives

1. Identify 4 themes emerging from the study regarding caregivers experience of implementing sleep positioning systems in children with neurodevelopmental disabilities
2. Identify 2 facilitators to successful use of sleep systems
3. Identify 2 barriers to successful use of sleep systems

Abstract

Neurodisability is defined as 'a group of congenital or acquired long-term conditions attributed to impairment of the brain and/or neuromuscular system that create functional limitations' (1). Muscle imbalance, weakness, and spasticity impact gross motor ability, may cause asymmetry leading to hip displacement, scoliosis and contractures which impact on pain, sleep, participation, activity and functional aspects of everyday life for both the child and their family (2). 24hr postural management (24hr PMP) is an intervention used to support children with complex neurodisability address body positions across their whole day, typically with equipment in sitting, standing, walking and lying, but also includes surgery, medication, Botox, splinting, and active exercise (3). Sleep systems are one aspect of 24hr PMP, and are individualised high or low tech lying equipment aimed at supporting the body in neutral lying positions. Some International Guidelines have influenced the adoption of 24hr PMP (4,5,6), with research on this intervention focused mainly on musculoskeletal alignment (7,8). However, there is limited evidence into the effectiveness of sleep systems and little on the families experience (9, 10, 11), and despite the practice recommendations, clinical experience indicates variance in caregivers' engagement with and adherence to this approach.

Method: A Masters by Thesis is currently being undertaken to explore caregivers experience of implementing sleep systems, and identify barriers and enablers to use. Using Interpretive Descriptive methodology, purposive sampling recruited eight caregivers from the wider Auckland region (New Zealand), with semi-structured interviews undertaken. Data is being analysed with themes emerging of caregivers experience of implementing sleep positioning systems

Results: Emerging themes, and barriers and facilitators to the use of sleep systems will be described. This study aims to contribute to the body of knowledge in the field of night-time postural care as this may help inform clinical practice and improve care for this population.

Content references:

1) Morris C, Janssen A, Tomlinson R, et al. (2013) Towards a definition of neurodisability: A Delphi survey. Developmental Medicine and Child Neurology 55(12): 1103–1108
2) Bayliss M. 24-Hour postural care and use of sleep systems in cerebral palsy (2020). Paediatrics and Child Health, https://doi.org/10.1016/j.paed.2020.05.005
3) Wynn N and Wickham J (2009) Night-time positioning for children with postural needs: What is the evidence to inform best practice? British Journal of Occupational Therapy 72(12): 543–550
4) Gericke, T. (2006). Postural management for children with cerebral palsy: consensus statement.

Developmental Medicine and Child Neurology, 48, 244.
5) Wynter, M., Gibson, N., Kentish, M., Love, S. C., Thomason, P., Willoughby, K., & Graham, H. K. (2014). Australian Hip Surveillance Guidelines for Children with Cerebral Palsy. https://www.ausacpdm.org.au/wp-content/uploads/2017/05/2014-Aus-Hip-Surv-Guidelines_booklet_WEB.pdf
6) NICE. (2012). Spasticity in under 19s: management. Clinical guideline. Retrieved September 17, 2107, from www.nice.org.guidance/cg145/resources/spasticity-in-under-19s-management-35109572514757
7) Goldsmith S (2000) The Mansfield Project. Postural care at night within a community setting: A feedback study. Physiotherapy 86(10):528-534
8) Humphreys G and Pountney T (2006) The development and implementation of an integrated care pathway for 24-hour postural management: A study of the views of staff and carers. Physiotherapy 92(4): 233-239
9) Humphreys G, King T, Jex J, et al. (2019) Sleep positioning systems for children and adults with neurodisability: A systematic review. British Journal of Occupational Therapy 82(1):5-14
10) Robertson J, Baines S, Emerson E, et al. (2016) Postural care for people with intellectual disabilities and severely impaired motor function: A scoping review. Journal of Applied Research in Intellectual Disabilities 31 (Supp 1):11-28
11) Stinson M, Crawford S, Madden E (2020) Current clinical practice in 24-hour postural management and the impact on carers and service users with severe neurodisability. British Journal of Occupational Therapy 0(0) 1–1. DOI: 10.1177/0308022620944739

Presenter biography

Jane Hamer is a paediatric physiotherapist and also the Clinical Leader of Physiotherapy (part-time), for WDHB (West Auckland and North Shore of Auckland). She has worked with children for 25+years, and is currently undertaking a Masters in Rehabilitation at Otago University.

D18: Choosing cushion protection over skin protection?!

Carlos Kramer
Vicair, Wormer, Netherlands
International Educator

Learning objectives

1. Upon completion of this session, attendees will be able to understand that moisture at the skin cushion interface affects both the barrier function and inflammatory response of loaded skin, making is more vulnerable to PU occurrence
2. Upon completion of this session, attendees will be able to understand that support surfaces with a microclimate management function show significant lower skin hydration levels compared with support surfaces without a microclimate management function
3. Upon completion of this session, attendees will be able to understand that the focus should be shifted from protecting the cushion against moisture to protecting the patient against moisture to prevent MASD and PU development

Abstract

The skin performs a variety of important physiological roles including protection from environmental exposure, preservation of internal homeostasis and thermoregulation. The moisture barrier is an essential component of this function. Moisture-Associated Skin Damage (MASD) pathophysiology is related to both recurrent chemical and physical irritation to the skin barrier, triggering inflammation and subsequent skin damage. The association between prolonged exposure to skin surface moisture and irritants to changes of mechanical skin properties of the skin and underlying tissue is linked with the risk of pressure ulcer development with the increase of the coefficient of friction and tissue stiffness changes. Moisture at the skin cushion interface affects both the barrier function and inflammatory response of loaded skin, making it more vulnerable to PU occurrence.

Support surfaces with a microclimate management function show significant lower skin hydration levels compared with support surfaces without a microclimate management function. When cushions were tested with a cover, the moisture dissipation over time increased relative to a similar cushion due to the wicking properties of the cushion cover.

Prolonged contact between skin and the moisture leads to hyperhydration, erythema and even breakdown of the skin barrier, making the skin more vulnerable for MASD and PU development. Therefore, the focus should be shifted from protecting the cushion against moisture to protecting the patient against moisture to prevent MASD and PU development.

Content references:

1) Guideline, T. I. (2019). *Prevention and Treatment of Pressure Ulcers / Injuries : Clinical Practice Guideline The International Guideline*.
2) Beeckman, D. (2017). A decade of research on Incontinence-Associated Dermatitis (IAD): Evidence, knowledge gaps and next steps. *Journal of Tissue Viability*, *26*(1), 47–56. https://doi.org/10.1016/j.jtv.2016.02.004
3) Reger, S. I., Ranganathan, V. K., & Sahgal, V. (2007). Support surface interface pressure, microenvironment, and the prevalence of pressure ulcers: An analysis of the literature. *Ostomy Wound Management*, *53*(10), 50–58.
4) Denzinger, M., Krauss, S., Held, M., Joss, L., Kolbenschlag, J., Daigeler, A., & Rothenberger, J. (2020). A quantitative study of hydration level of the skin surface and erythema on conventional and microclimate

5) management capable mattresses and hospital beds. *Journal of Tissue Viability*, *29*(1), 2–6. https://doi.org/10.1016/j.jtv.2019.12.001
6) Strobel, C. (2016). *Sensible Moisture Testing on Six Vicair Cushions*. *84014*(October).

Presenter biography

Carlos Kramer specialised himself in seating and positioning through gaining practical experience whilst working for long term care centres, rehabilitation centres and rehab vendors. His educational background is in physics and before pursuing his passion in the industry, he spent 7 years teaching in schools on all levels. He expanded his knowledge of seating and positioning through his close relations and now colleagues Sharon Sutherland-Pratt, Bengt Engström and Bart Van der Heijden. Carlos is the head of education at Vicair since 2012 and continues to combine his expertise in teaching and passion for seating to provide high quality education in the field worldwide.

D19: COVIDisruption: evolving home-based MWC skills training to full telerehabilitation delivery

Ed Giesbrecht[1], Dr. Krista Best[2], Dr. Francois Routhier[2], Dr. Celine Faure[2], Dr. Julie Faieta[2]
[1]University of Manitoba, Winnipeg, Canada.
[2]Université Laval, Quebec, Canada
Ed Giesbrecht, Associate Professor

Learning objectives

On completion of the workshop, participants will be able to:

1. describe factors that create barriers to wheelchair skills training ;
2. identify benefits of peer trainer and eHealth approaches to skills training;
3. discuss how an eHealth training intervention can be effective in a mid/post-COVID context.

Abstract

Many individuals receive a manual wheelchair (MWC) to address mobility impairment, yet they experience restricted social participation and mobility because they lack *skills* to independently, safely, and effectively use their MWC (Smith et al., 2016). Access to comprehensive *MWC training* is constrained by expense and limited availability of skilled therapists, demands of patient or clinician travel, and lack of community-based training opportunities, particularly in rural areas (Best et al., 2016). Alternative and disruptive rehabilitation approaches are required that are clinically effective, cost-effective, and sustainable (Giesbrecht & Miller, 2017). Two strategies have demonstrated the potential to reduce burden on the healthcare system: delivery in the community via a mobile device training app and use of peer trainers. These approaches are compatible and synergistic to ameliorate training issues among MWC users in a way that is cost-effective; delivered in an optimal time and context; and in a sustainable way. *Training to Enhance Adaptation and Management for Wheelchair users* (TEAMWheels) was initially developed as a 4-week, community-based program integrating in-person peer-led and independent eHealth home training components. Our purpose was to *evaluate the effect* of TEAM Wheels on participation, MWC skill capacity, self-efficacy and quality of life in an RCT design. Shortly before implementation, the COVID-19 pandemic created conditions where in-person training and data collection became impossible. In response, our team rapidly reconfigured TEAM Wheels to be delivered entirely via eHealth. The peer-training component was modified to be delivered using a secure teleconferencing application using the same computer tablet as the home training application. Data collection was adapted with a variety of online, telephone and secure teleconferencing options to meet specific participant needs. This presentation will describe the TEAM Wheels intervention elements, detail the strategies employed to adapt the intervention mid-course into eHealth delivery (while respecting COVID-19 precautions), and provide preliminary study findings.

Content references:

1) Smith EM, Giesbrecht EM, Mortenson WB, Miller WC. Prevalence of wheelchair and scooter use among community-dwelling Canadians. Phys Ther. 2016 Aug;96(8):1135–42.
2) Best KL, Miller WC, Huston G, Routhier F, Eng JJ. Pilot study of a peer-led wheelchair training program to improve self-efficacy using a manual wheelchair: A randomized controlled trial. Arch Phys Med Rehabil. 2016 Jan;97(1):37–44.
3) Giesbrecht EM, Miller WC. A randomized control trial feasibility evaluation of an mHealth intervention for wheelchair skill training among middle-aged and older adults. PeerJ. 2017 Oct 5;5:e3879.

Presenter biographies

Ed Giesbrecht began working as an occupational therapist in 1994, developing a particular interest in assistive technology and wheeled mobility, serving as clinical specialist in an Assistive Technology clinic in Winnipeg, Canada. His research interest drew him to academia to pursue a master's and PhD degree. He is an Associate Professor in the department of Occupational Therapy at the University of Manitoba. His research focuses on strategies to address wheelchair mobility skills and training, improving entry-to-practice education, and winter mobility.

Dr. Krista Best is an Assistant Professor in the Faculty of Medicine at Université Laval and a Quebec Health Research Foundation Junior 1 Scholar at the Centre for Interdisciplinary Research in Rehabilitation and Social Integration in Quebec, Canada. She dedicates 90% of her time to her research in mobility, social participation and adapted physical activity. Dr. Best has expertise in developing and evaluating community-based wheelchair skills training programs for manual and power wheelchairs, including clinician-led, peer-led and mHealth approaches to training. As a Canada Vanier Scholar during her PhD, she published the first evidence for peer-led approaches to wheelchair training. While most of her research has focused on adults, she has recently begun to investigate best practices in children and youth. A member of the Wheelchair Skills Program editorial committee since 2001, Dr. Best continues to inform the evolution of the Wheelchair Skills Program.

A16: Using power mobility as a therapeutic intervention to support development and learning across the lifespan

Dr Lisbeth Nilsson[1], Dr Lisa Kenyon[2]
[1]Associated to Health Science Centre, Lund University, Lund, Sweden. [2]Grand Valley State University, Grand Rapids, Michigan, USA
Dr Lisbeth Nilsson, researcher and occupational therapist
Dr Lisa Kenyon, Professor

Learning objectives

1. Explain the value of the ALP in supporting power mobility interventions for infants and people with severe or profound cognitive impairments.
2. Discuss the value of using power mobility as a therapeutic intervention to facilitate development and tool use learning in infants and people with severe or profound cognitive impairments.
3. Connect early phases in the learning process to three specific sensorimotor/cognitive achievements attained through power mobility practice in infants and people with severe or profound cognitive impairments.

Abstract

Four decades have passed since powered mobility studies first documented the developmental and functional benefits of self-generated mobility for children with disabilities. But why are power mobility interventions still so rarely used with the youngest children, and almost entirely absent for people of all ages who have severe or profound cognitive impairments?

Infants and people with severe or profound cognitive impairments are typically unable to voice their needs or desires. Advocating is therefore a task that falls to stakeholders such as parents, relatives, therapists, and care staff who serve as their vicarious voices. Familiarity with an individual's needs and desires, and knowledge of the developmental and learning opportunities provided by powered mobility intervention, are prerequisites for effectively becoming this vicarious voice. To advocate effectively, the stakeholders themselves must be confident that the intervention will provide valuable and beneficial achievements.

Insights from research on infant development and tool use learning help to explain the importance of self-generated mobility for these individuals. We will highlight the developmental achievements and tool use learning that may be gained through therapeutic power mobility intervention with infants and people with severe or profound cognitive disabilities. Showcasing and detailing these valuable achievements that are inter-related and built on each other, may inspire and motivate stakeholders to advocate for therapeutic power mobility interventions for these vulnerable populations in need of unique approaches.

In addition, being able to recognize, track, interpret, and facilitate minor changes and achievements associated with becoming a power mobility tool user are important in cultivating stakeholders' motivation and persistence to engage in the intervention. The Assessment of Learning Powered mobility use (ALP) can be used to assess and facilitate necessary achievements, thereby supporting stakeholders' motivation to persist with practice over the prolonged periods of time needed to achieve desired outcomes in these focused populations.

Content references:

1) Hacques, G., et al. (2020). "Exploring to learn and learning to explore." Psychological Research, 2020 May 10. doi:10.1007/s00426-020-01352-x. Online ahead of print
2) Kahrs, B., & Lockman, J. (2014). "Building Tool Use from Object Manipulation: A Perception–Action

Perspective." Ecological Psychology 26(1/2): 88-97. doi:10.1080/10407413.2014.874908
3) Kenyon, L., et al. (2015). "Promoting self-exploration and function through an individualized power mobility training program." Pediatric Physical Therapy 27(2): 200-206. doi:10.1097/PEP.0000000000000129
4) Kenyon, L., et al. (2020). "“Make it fun”: a qualitative study exploring key aspects of power mobility interventions for children." Disability and Rehabilitation: Assistive Technology: 1-9. doi:10.1080/17483107.2020.1849431. Online ahead of print
5) Lockman, J., & Kahrs, B. (2017). "New Insights into the Development of Human Tool Use." Current Directions in Psychological Science, 26(4): 330-334. doi:10.1177/0963721417692035
6) Nilsson, L., et al. (2011). "Driving to learn in a powered wheelchair: The process of learning joystick use in people with profound cognitive disabilities." American Journal of Occupational Therapy 65(6): 652-660. doi:10.5014/ajot.2011.001750
7) Nilsson, L., & Durkin, J. (2014). "Assessment of learning powered mobility use-Applying grounded theory to occupational performance." Journal of Rehabilitation Research and Development, 51(6): 963-974. doi:10.1682/JRRD.2013.11.0237
8) Nilsson, L., & Durkin, J. (2017). "Powered mobility intervention: understanding the position of tool use learning as part of implementing the ALP tool." Disability and Rehabilitation: Assistive Technology 12(7): 730-739. doi:10.1080/17483107.2016.1253119
9) Livingstone, R., & Paleg, G. (2014). "Practice considerations for the introduction and use of power mobility for children." Developmental Medicine & Child Neurology, 56(3): 210-221. doi:10.1111/dmcn.12245

Presenter biography

Lisbeth Nilsson is a PhD and specialist in occupational therapy and associated researcher of Occupational Therapy and Occupational Science Group in Lund University, Sweden. She became an occupational therapist in 1974, earned a Master degree in 1996 and a Doctoral degree in 2007. She developed the intervention Driving to Learn in powered wheelchair for people with cognitive disabilities (1993-2007). Her special interests are tool use learning and assessment and facilitation of the learning process. She and her collaborator Durkin, PhD, UK, developed the Assessment of Learning Powered mobility use (ALP) (2009-2013). One of her current interests is what drives human development, learning and creates meaning-making in activity and participation.

Dr. Kenyon is a Professor in the Department of Physical Therapy at Grand Valley State University in Grand Rapids, Michigan. Dr. Kenyon heads the Grand Valley Power Mobility Project, an inter-professional research and service project that provides power mobility training for infants, toddlers, children and young adults who are not typically considered to be candidates for power mobility use. Dr. Kenyon presents nationally and internationally on topics related to pediatric physical therapist practice and has published multiple peer-reviewed journal articles and book chapters pertaining to power mobility and pediatric topics. Dr. Kenyon currently serves on the Editorial Committee for the Wheelchair Skills Program (Dalhousie University, Halifax, Nova Scotia, Canada) and on the Pediatric Specialty Council of the American Board of Physical Therapy Specialties.

B15: Wheelchair Educators' Package: a tool to enhance wheelchair education globally

Paula W Rushton, paula.rushton@umontreal.ca, Canada, Université de Montréal
Mary Goldberg, mgoldberg@pitt.edu, United States, University of Pittsburgh
Yohali Burrola-Mendez, anhue.yohali.burrola-mendez.hsj@ssss.gouv.qc.ca, Canada, Université de Montréal
Jon Pearlman, jpearlman@pitt.edu, United States, University of Pittsburgh
Debbie Wilson, deb@seatingtogo.co.nz, New Zealand, Seating to Go – Geneva Healthcare
Sara Munera, saram@wheelchairnetwork.net, Colombia, ISWP
Rosie Gowran, rosie.gowran@ul.ie, Ireland, University of Limerick

Keywords: wheelchair service provision, healthcare personnel, education, global, training

Presentation type: 90 minutes instructional session/workshop.
Presentation level: Beginner - Intermediate

Learning objectives
By the end of this workshop participants will be able to:

- describe the Wheelchair Educators' Package purpose and content;
- identify how the Wheelchair Educators' Package may be used to enhance the wheelchair education provided within their training programs; and
- to describe how at least 1 component of the Wheelchair Educators' Package may be useful for integrating or modifying wheelchair education in their context.

Abstract

It is estimated that 75 million people with disabilities around the world need wheelchairs in order to fulfill all human rights (WHO, 2018). Providing wheelchairs, and other assistive technology, can increase health and wellbeing of individuals and reduce social exclusion. It can also have important economic benefits for a person and a community (ATScale, 2020). Unfortunately, only between 5-15% of those in need of a wheelchair can access one (WHO, 2018). This increases inequity and limits the ability for countries to meet their obligations under the United Nations Convention on the Rights of Persons with Disabilities.

An increasingly recognized barrier to access appropriate wheelchairs is the lack of trained wheelchair personnel (Fung, 2017). Not all educational institutions teach wheelchair content, and there is great variability in what and how it is taught and evaluated. To support the integration of wheelchair content into universities and regional training centers globally, the Wheelchair Educators' Package has been developed by a diverse group of 30 people, with representation from different professions and economic settings, including technical experts, end-users, experts in assessing evidence and stakeholders. This package will enable programs to strengthen rehabilitation systems worldwide, through appropriately trained professionals in wheelchair service provision.

In this workshop, we will describe the participatory action research approach used to develop the Wheelchair Educators' Package and an overview of the content. Participants will have the opportunity to engage in simulated use of the Package in order to explore how it may be used to address training needs of wheelchair service providers in their contexts. Facilitated discussion will enable participants to provide feedback on how the Package could be improved to meet the education needs within their contexts. Post-conference, all participants will be notified of the Wheelchair Educators' Package launch.

References:

- World Health Organization. Assistive Technology. Key Facts. 2018.

- ATScale. Global partnership for Assistive Technology. The Case for Investing in Assistive Technology. 2020.
- Fung KH, Rushton PW, Gartz R, Goldberg M, Toro ML, Seymour N, Pearlman J. Wheelchair service provision education in academia. Afr J Disabil. 2017 Sep 8;6:340. doi: 10.4102/ajod.v6i0.340. PMID: 28936415; PMCID: PMC5594266.

Presenter biographies

Paula Rushton is an Associate Professor in the School of Rehabilitation, Occupational Therapy Program at the University of Montréal and a researcher at the CHU Ste-Justine Research Center. Her research is focused on measurement, intervention, knowledge translation and education related to improving the wheeled mobility of both adults and children through an improved wheelchair service provision process. From the measurement, intervention and knowledge translation perspective, Rushton's expertise lies in the domains of wheelchair skills and wheelchair confidence. From the education perspective, Rushton has been working with the International Society of Wheelchair Professionals to enhance wheelchair content in health care professional university curricula globally.

Mary Goldberg is an Associate Professor in the School of Health and Rehabilitation Sciences and Education and Outreach Project Director at the Human Engineering Research Laboratories at the University of Pittsburgh. Goldberg focuses on developing and testing evidence-based online continuing education interventions for rehabilitation professionals. She is Project Co-Director for the International Society of Wheelchair Professionals grant sponsored by USAID and the NIDILRR Initiative to Mobilize Partnerships for Successful Assistive Technology Translation (IMPACT) Center. She teaches a rehabilitation engineering design course series and two Coursera Massive Open Online Courses (MOOC) on "idea 2 Impact" and "Disability Awareness and Supports".

Yohali Burrola-Mendez is a Postdoctoral fellow at the University of Montreal and the CHU Ste-Justine Research Center. Yohali received her BS and MS in Physical Therapy and her PhD in Rehabilitation Sciences. Her research is focused on the development and implementation of educational interventions related to improving wheelchair service provision competencies among rehabilitation professionals and lay health workers in low - to high income settings. Yohali has been working with the International Society of Wheelchair Professionals since 2015.

Jon Pearlman is an Associate Professor & Chair in the Department of Rehab Science & Technology, and the founding director of the International Society of Wheelchair Professionals. Jon received his BS and MS in Mechanical Engineering, and his PhD in Rehabilitation Science. Jon is a translational researcher focused on developing and improving technologies which support physical rehabilitation and improve the lives of people with disabilities.

Debbie Wilson is an Occupational Therapist with over 30 years clinical experience. She is the Service Manager and training facilitator of Seating To Go, part of the Geneva Healthcare Group and a leading wheelchair and seating assessment, training and repair service in New Zealand. In 2009, she helped develop the NZ Ministry of Health wheeled mobility and postural management credential for occupational therapists and physiotherapists. She is the NZ Chair for OSS and has contributed to capacity building in the Pacific Islands with Motivation Australia. Deb is currently a member of the ISWP Wheelchair Educators' Package Development Group.

Rosie Gowran is the Course Director of MSc Occupational Therapy (Professional Qualification) and Post-Graduate Certificate in Posture Seating and Wheelchair Mobility Across the Life Course, University of Limerick. She is an Implementation Scientist, Occupational Therapist and human rights

activist. She adopts a human security approach to support people with disabilities, particularly people who use wheelchairs, to address service system challenges and erosion of personhood. Building sustainable communities of practice in health and social care is the overarching theme that drives Rosie's research and education philosophy to advocate for appropriate person-centred service provision as a responsibility of the whole community. Her principal research interest is to investigate health and social care system infrastructure from a human rights and health promotion perspective. She uses participatory, stakeholder-centred inclusive mixed methodologies, towards collective development of sustainable policy, implementation and provision of appropriate services to meet peoples' needs throughout life.

Sara Munera, serves as technical coordinator of the International Society of Wheelchair Professionals. Sara has a BS in physiotherapy and MS in Rehab Science & Technology. Sara is from Colombia and is the founder of Whee, a company that supports assistive technology education in latinamerica.

C17: How Do People Actually Use Their Manual Wheelchairs, and What Really Matters?

Curt Prewitt, PT, MPT Deborah Pucci
Ki Mobility, LLC, Stevens Point, Wisconsin, USA
MS, PT, ATP Curt Prewitt, Director of Education
PT, MPT Deborah Pucci, Clinical Educator

Learning objectives

1. Following this presentation, participants will be able to cite 2 examples of how end users move about in wheelchairs during everyday life.
2. Following this presentation, participants will be able to describe 3 physical principles that impact propulsion efficiency of a manual wheelchair.
3. Following this presentation, participants will be able to describe 3 component selections that impact propulsion efficiency of a manual wheelchair.

Abstract

Every manual wheelchair user would like their chair to be a high-performance machine. Performance is impacted by principles involved in translating human movement into movement of a wheelchair and factors that contribute to energy loss. In order to help end users achieve maximum performance, persons involved in the wheelchair selection process need to have a fundamental understanding of how people use their wheelchairs, and how those wheelchairs function.

This presentation will examine the real-world behaviors of manual wheelchair users and discuss the mechanical principles and factors that affect propulsion efficiency. In addition to explaining some details of the science involved, we hope to inspire participants to think critically about their current understandings and beliefs on this topic.

Content references:

1) Boninger, M. L., Baldwin, M., Cooper, R. A., Koontz, A., Chan, L. Manual wheelchair pushrim biomechanics and axle position. *Arch Phys Med Rehabil*. 2000;81(5):608–613. https://doi:10.1016/s0003-9993(00)90043-1
2) Boninger, M. L., Souza, A. L., Cooper, R. A., Fitzgerald, S. G., Koontz, A. M., Fay, B. T. Propulsion patterns and pushrim biomechanics in manual wheelchair propulsion. *Arch Phys Med Rehabil*. 2002;83(5):718–723. https://doi:10.1053/apmr.2002.32455
3) Caspall, J. J., Seligsohn, E., Dao, P. V., & Sprigle, S. (2013). Changes in inertia and effect on turning effort across different wheelchair configurations. *Journal of Rehabilitation Research and Development*, *50*(10), 1353–1362. https://doi.org/10.1682/JRRD.2012.12.0219
4) Collinger JL, Boninger ML, Koontz AM, et al. Shoulder biomechanics during the push phase of wheelchair propulsion: a multisite study of persons with paraplegia. *Arch Phys Med Rehabil*. 2008;89(4):667–676. doi:10.1016/j.apmr.2007.09.052
5) Cowan, R. E., Nash, M. S., Collinger, J. L., Koontz, A. M., & Boninger, M. L. (2009). Impact of surface type, wheelchair weight, and axle position on wheelchair propulsion by novice older adults. *Archives of Physical Medicine and Rehabilitation*, *90*(7), 1076–1083. https://doi.org/10.1016/j.apmr.2008.10.034
6) Gutierrez, D. D., Mulroy, S. J., Newsam, C. J., Gronley, J. K., Perry J. Effect of fore-aft seat position on shoulder demands during wheelchair propulsion: part 2. An electromyographic analysis. *J Spinal*

Cord Med. 2005;28(3):222–229. https://doi:10.1080/10790268.2005.11753816

7) Kauzlarich, J. J., & Thacker, J. G. (1985). Wheelchair tire rolling resistance and fatigue. Journal of Rehabilitation Research and Development, 22(3), 25–41.
8) Klepeis, N. E., Nelson, W. C., Ott, W. R., Robinson, J. P., Tsang, A. M., Switzer, P., Behar, J. V., Hern, S. C., & Engelmann, W. H. (2001). The National Human Activity Pattern Survey (Nhaps): A resource for assessing exposure to environmental pollutants. *Journal of Exposure Science & Environmental Epidemiology*, *11*(3), 231–252. https://doi.org/10.1038/sj.jea.7500165
9) Lin, J.-T., & Sprigle, S. (2019). The influence of operator and wheelchair factors on wheelchair propulsion effort. *Disability and Rehabilitation: Assistive Technology*, 1–8. https://doi.org/10.1080/17483107.2019.1578425
10) Sagawa Jr., Y., Watelain, E., Lepoutre, F.-X., & Thevenon, A. (2010). Effects of wheelchair mass on the physiologic responses, perception of exertion, and performance during various simulated daily tasks. Archives of Physical Medicine and Rehabilitation, 91(8), 1248–1254. https://doi:10.1016/j.apmr.2010.05.011
11) Sawatzky, B. J., Denison, I., & Kim, W. O. (2002). Rolling, rolling, rolling. Rehab Management, 9, 36–39.
12) Sonenblum, S. E., Sprigle, S., & Lopez, R. A. (2012). Manual wheelchair use: Bouts of mobility in everyday life. *Rehabilitation Research and Practice*, *2012*, 1–7. https://doi.org/10.1155/2012/753165
13) Sprigle, S., & Huang, M. (2015). Impact of mass and weight distribution on manual wheelchair propulsion torque. *Assistive Technology*, *27*(4), 226–235. https://doi.org/10.1080/10400435.2015.1039149
14) Sprigle, S., Huang, M., & Misch, J. (2019) Measurement of rolling resistance and scrub torque of manual wheelchair drive wheels and casters, *Assistive Technology*, 1-13. https://doi.org/10.1080/10400435.2019.1697907
15) van der Woude, L. H., Geurts, C., Winkelman, H., & Veeger, H. E. (2003).Measurement of wheelchair rolling resistance with a handlebar push technique. Journal of Medical Engineering & Technology, 27(6), 249–258. https://doi:10.1080/03091900310000096630

Presenter biography

Curt Prewitt is Director of Education for Ki Mobility. He has a BS in Exercise Physiology and an MS in Physical Therapy from the University of Colorado. He practiced as a physical therapist in a number of settings for a few years, most prominently in long term care, where he gained experience with seating and wheeled mobility. He transitioned from a practicing therapist to a manufacturer's representative, eventually moving into sales management and focusing on complex rehab technology. Throughout his tenure on the manufacturer's side in the complex rehab arena, he has dealt largely with pediatric positioning and mobility products. He has previously also served as a product trainer/product specialist, teaching product features and clinical application, as well as coordinating continuing education presentations, both credited and non-credited. He has presented continuing professional education courses across the US and internationally.

D20: Strategies for Online Training in Seating & Mobility Complimented with Telehealth

Dr. Mark Schmeler, Ms. Madelyn Betz
University of Pittsburgh, Pittsburgh, USA
Dr. Mark Schmeler, Associate Professor
Ms. Madelyn Betz, Research Assistant

Learning objectives

Upon attending this session learners will be able to:

1. List 3 findings of research studies related to the outcomes of telehealth services for seating and mobility.
2. Explain 3 factors that have contributed to the shift to online training.
3. Identify 3 strategies to support remote student clinical observations.

Abstract

The recent global pandemic created many challenges in the delivery of seating and mobility services and further impacted student clinical training. For years clinical researchers at the University of Pittsburgh and others have investigated the feasibility and effectiveness of telehealth strategies in the provision of seating and mobility. Likewise, many academic programs have been shifting to online education. This session will review recent research in telehealth as it applies to seating and mobility services as well as current trends for online clinical education. This session will then describe a new online/hybrid Master of Rehabilitation Technology degree program and how telehealth strategies were applied to address student clinical observations. Finally, the perspectives of a graduate student and clinical instructor in the program will be shared for discussion.

Content references:

1) Ott, K.K., **Schein,** R.M., Straatmann, J., Schmeler, M.R., & Dicianno, B.E. (2021). Development of a home-based telerehabilitation service delivery protocol for wheelchair seating and mobility within the Veterans Health Administration. *Military Medicine, 186.* Published February 27, 2021. DOI: https://doi.org/10.1093/milmed/usab091
2) Bell, M., **Schein,** R.M., Straatmann, J., Dicianno, B.E., & **Schmeler,** M.R. (2020). Functional mobility outcomes in telehealth and in-person assessments for wheeled mobility devices. *International Journal of Telerehabilitation,12*(2). 27-34. DOI: https://doi.org/10.5195/ijt.2020.6335
3) Schein, R.M., **Schmeler, M.R.**, Holm, M.B., Saptono, A., & Brienza, D.M. (2010). Telerehabilitation Wheeled Mobility and Seating Assessments Compared with In-Person. *Archives of Physical Medicine and Rehabilitation*, 91(6), 874-878. PMID: 20510977.

Presenter biography

Mark Schmeler is an Associate Professor and Vice Chair for Education & Training in the Department of Rehabilitation Science & Technology at the University of Pittsburgh. He oversees all aspects of the graduate training curriculums and continuing education in the field of Assistive Technology. He is also an Occupational Therapist and Assistive Technology Professional with over 30 years of experience. He continues to practice part-time at the Center for Assistive Technology at the University of Pittsburgh Medical Center where he also serves as Interim Director. His area of research is focused on clinical outcomes and service delivery models to foster evidence-based practice and equitable policy for access to products and services. He has published several peer-reviewed articles and position papers related to tool

development, registries, telehealth, and best-practices in Assistive Technology.

Madelyn Betz is a graduate student in the Master of Rehabilitation Technology program at the University of Pittsburgh. She also works as a research assistant on a project related to the investigation of global policies related to wheelchair services to identify new models for implementation in the United States.

A17: Think Lego, a constructive approach for paediatric mobility

Allied Medical Sponsor session

Eric Van Olst
Karma Medical
Chief Innovation Officer

Presenter biography

With over 30 years of experience in the wheelchair market, Eric brings with him a wealth of knowledge and experience. Since joining the Karma company, Eric has already been involved in the design of many topline power wheelchairs, which benefit not just the users but also the therapists, family members and service engineers, including EVO Altus Power Standing Wheelchair 2018 Red Dot award, EVO Lectus Prescription Power Wheelchair 2015 iF Design award

B16: The Seat Cushion Micro Climate: Surface Temperature, Moisture and Humidity - Effects on Skin Integrity

Ms Amy Bjornson
Sunrise Medical, Wetherill Park, Australia, Clinical Director

Learning objectives

Upon completion of this course, the participant will:

1. Identify the primary mechanisms by which heat, moisture and humidity can negatively affect the skin's health and integrity
2. List 4 mechanisms of reducing the risk of tissue injury due to heat and moisture.
3. Identify strategies to assess a cushion's ability to protect skin from damage due to moisture, heat or humidity

Abstract

Historically, the term Microclimate has been used in a weather or topographical context, but as of late it has made its way into the complex rehab industry to describe the mini-atmosphere of increased skin temperature and moisture at the seating interface. Because of their limited mobility and sensation, wheelchair users are at risk for tissue injuries. We've known for decades that pressure and shear are clear culprits in these injuries, but continued research is determining that higher skin surface temperature and moisture are also contributing factors and management of this climate is also critical in healthy skin promotion.

This session will investigate the existing research on the contribution of temperature and moisture in pressure injuries, the body's response to heat stress in common mobility disorders and the overall effect on skin integrity. We will also discuss the research currently underway at Southern Cross University in Queensland, Australia. This study is investigating clients using several common wheelchair cushions. Performance parameters being investigated include cushion surface temperature, cushion humidity and client body temperature.

Content references:

1) Temperature-Modulated Pressure Ulcers: A Porcine Model Arch Phys Med Rehabil Vol 76, July 1995 Kokate, MS, Keith J. Leland, Andrew M. Held, BS, Gary L. Hansen, MS, Graig L. Kveen, BS, Brooks A. Johnson, Mark S. Wilke, MD, Ephraim M. Sparrow, PhD, Paul A. laizzo, PhD
2) Relative Contributions of Interface Pressure, Shear Stress, and Temperature on Ischemia induced, Skin-reactive Hyperemia in Healthy Volunteers: A Repeated Measures Laboratory Study Ostomy Wound Manage. 2015;61(2):16–25 2 Lachenbruch, C BES, MS, PhD; Tzen, Y PhD; Brienza, D PhD; Karg, P MS; Lachenbruch, PPhD
3) Ostomy Wound Manage. 2005 Feb;51(2):70-9. Skin Cooling Surfaces: Estimating the Importance of Limiting Skin Temperature. Lachenbruch, PPhD
4) Microclimate: A critical review in the context of pressure ulcer prevention Jan Kottner, Joyce Black, Evan Call, Amit Gefen, Nick Santamaria; Clinical Biomechanics Volume 59, November 2018, 62-7

Presenter biography

Trained as a Physical Therapist in the United States, **Amy Bjornson** has over 20 years' experience working with adult and pediatric neurologic populations, with specialties in the treatment of spinal cord injury, and provision

of assistive technology for clients with physical challenges.

Based in Sydney, Amy currently develops and implements national and international training programs on using Assistive Technology to enhance inclusion, health and well-being in those with physical disabilities. She also serves a product improvement and development role for Sunrise Medical, Australia.

Amy is a dynamic speaker who has lectured extensively on seating and mobility. She has also traveled to several developing countries, learning and sharing information with their medical communities.

Amy received her ATP certification in 1995, SMS certification in 2015 and Australian Physiotherapy certification in 2018. She is an active member of Wheelchairs for Humanity, Health Volunteers Overseas and offers technology support to Hidden Treasures Home, Fuzhou China

C18: Vibration's Effect on a Manual Wheelchair User

Allied Medical sponsor session

Curt Prewitt
Director of Education
Ki Mobility. USA

Presenter biography

Curt Prewitt is Director of Education for Ki Mobility. He has a BS in Exercise Physiology and an MS in Physical Therapy from the University of Colorado.

He practiced as a physical therapist in a number of settings for a few years, most prominently in long term care, where he gained experience with seating and wheeled mobility. He transitioned from a practicing therapist to a manufacturer's representative, eventually moving into sales management and focusing on complex rehab technology. Throughout his tenure on the manufacturer's side in the complex rehab arena, he has dealt largely with pediatric positioning and mobility products. He has previously also served as a product trainer/product specialist, teaching product features and clinical application, as well as coordinating continuing education presentations, both credited and non-credited. He has presented continuing professional education courses across the US and internationally.

D21: Amplify the push – Using manual wheelchairs without strain and pain

Invacare sponsor session

Michael Urso
Senior Product Manager
Alber, Germany

Abstract

Permanent and frequent use of a manual wheelchair may often lead to problems regarding the musculoskeletal system resulting in pain and chronic pathologies. From a biological perspective the human upper body, especially shoulder and arms seem to not be designed to replace the legs in long term. However, the use of manual wheelchairs respectively the manual propulsion of such seems to also have a positive benefit for the wheelchair occupant compared to the use of pure electric wheelchairs that are controlled via joystick. In this context the use of a Pushrim-Activated Power Assisted Wheelchairs (PAPAW) that amplify the force of the occupant's push seems to be an interesting alternative.

During this presentation the concept of PAPAW will be introduced as well as several independent studies that have been carried out to examine the benefit of PAPAWs in comparison to the use of pure manual wheelchairs and electric joystick-controlled wheelchairs. In addition, some information will be given on how to find and setup the appropriate solution according to pathology and need of the wheelchair occupant.

Content References:

1) Medical Engineering & Physics. 37, 10, p. 961-968 8 p., Oct. 2015
2) Clinical Rehabilitation, vol. 27, no. 4, pp. 299–313, Sep. 2012
3) Disability and Rehabilitation: Assistive Technology Volume 4, 2009 - Issue 3 Volume 4, 2009 - Issue 3, Sep. 2008
4) Arch Phys Med Rehabil 2005; 86:380-6., Jan. 2005
5) Arch Phys Med Rehabil. 2004 Nov;85(11):1865-71., Nov. 2004
6) Arch Phys Med Rehabil. 2001 May;82(5):702-8., May 2001
7) Proceedings RESNA Annual Conference, Orlando, FL, 2000;510-512, Jan. 2000

Presenter biography

Michael Urso is senior product manager at Alber in Germany that is part of the Invacare Group. Alber is leading specialist for portable add-on drives for manual wheelchairs. Michael has been working for Alber for 15 years and is responsible for marketing and development of Aber's Pushrim-Activated Power Assisted Wheelchair (PAPAW) range such as the e-motion M25 and the twion T24. Michael has been active as speaker on several international conferences.

A18: Diversifying Standing Opportunities for Children: Clinically reasoning the options and justifying their funding

Mr Jamie Cockle
SWCO, Sydney, Australia
Product Specialist

Learning objectives

1. *To recognise the clinical application of four different styles of standing frame available to a child*
2. *Recognise five benefits of incorporating standing as part of a 24-hour positioning approach*
3. *Identify three barriers to establishing effective standing programs at home*

Abstract

Standing upright is widely recognised as one of the most important evolutionary changes in our history as a species. It is documented that prolonged periods of sitting can increase mortality and have detrimental impacts on our cardiovascular, metabolic, and mental health (1,2).

Prolonged sitting, such as office workplace environments, is regarded by many to be an emerging public health concern, with periods longer than 20-30 minutes considered to be clinically significant (3). Whilst the need for us to regularly move and change position throughout our day is now widely recognised, for those with a physical disability, access to positions such as standing or weight-bearing remains a big challenge.

To achieve optimum outcomes, selection of sufficient equipment based on individual characteristics is necessary (4). Seating assessment techniques among other assessment tools can provide a wealth of information relating to biomechanics and physical evaluation (5). The data gleaned from these assessments can further inform the selection of appropriate standing frames in relation to the function of the user. This data can also highlight contraindications to the use of particular devices for the individual.

How can we support clients with varying clinical presentations to achieve a common goal of weight-bearing and standing? How do we educate and nurture how standing is prioritised in a child's day to gain the understood benefits? How do we harness the clinical reasoning and understanding of these benefits to justify the required funding?

This workshop provides an introduction to the different styles of standing/weight-bearing that can be supported through equipment provision. The presenter will draw on case studies and clinical experience to explore these options and how one can promote optimum outcomes. We will discuss the barriers to why appropriate standing programs aren't followed and how we can understand these to improve compliance and tolerance.

Content references:

1) Paleg, G. S., Smith, B. A., & Glickman, L. B. Systematic Review and Evidence Based Clinical Recommendations for Dosing of Paediatric Supported Standing Programs. Paediatric Physical Therapy 25(3), 232-247 (2013)
2) Chandrasekaran, B., Pesola, A.J., Rao, C.R. et al. Does breaking up prolonged sitting improve cognitive functions in sedentary adults? A mapping review and hypothesis formulation on the potential physiological mechanisms. BMC Musculoskelet Disord 22, 274 (2021).
3) Thorp, A.A., Healy, G.N., Winkler, E. et al. Prolonged sedentary time and physical activity in workplace and non-work contexts: a cross-sectional study of office, customer service and call centre employees. Int J Behav Nutr Phys Act 9, 128 (2012).
4) Macias-Merlo L, Bagur-Calafat C, Girabent-Farrés M, Stuberg WA.

Standing Programs to Promote Hip Flexibility in Children With Spastic Diplegic Cerebral Palsy. Pediatr Phys Ther. 2015 Fall;27(3):243-9
5) State Spinal Cord Injury Services, Spinal Seating Modules. The Mechanical Assessment Tool (MAT) https://aci.health.nsw.gov.au/networks/spinal-cord-injury/spinal-seating/module-3/the-mechanical-assessment-tool-mat (Accessed 2021)

Presenter biography

Jamie Cockle completed his training in Physiotherapy at Cardiff University, UK in 2015. He is passionate about Paediatrics and ensuring all children, no matter their ability have opportunities to be well supported as they grow and develop. He understands how comprehensive postural management can have a strong influence on functionality, health, and the ability to lead a positive lifestyle.

Jamie has gained extensive clinical experience during his work as an acute neurological and orthopaedic Paediatric Physiotherapist within the NHS with further roles within highly specialised community services for children with rare conditions. These experiences enabled him to work closely with a diverse range of clients understanding not only their needs but the families that support them as well.

Since arriving in Australia in 2019 Jamie has applied his acquired clinical knowledge and understanding in his work as a product specialist, working with a wide range of products and solutions, pairing up the right assistive technology with the right clients.

A19: Allied Medical Platinum Sponsor Session:

A New Frontier: Introducing the Quantum 4Front 2.

Jay Doherty (USA)

Presenter biography

Jay Doherty has 26 years of experience working in the assistive technology field with a concentration in complex rehab technology. As the director of clinical education at Quantum Rehab, Jay presents nationally and internationally on seating and wheeled mobility, focusing on evaluation and application of available technologies.

Before joining Quantum, Jay worked in both rehabilitation and assistive technology settings. His expertise ranges from pediatrics to adults. His presentations reflect a strong emphasis on different technology interventions. Jay currently sits on the Mobility Management Editorial Board and holds his ATP and SMS certifications from RESNA.

B17: Culturally Safe Practice in Aotearoa New Zealand as a Wheelchair and Seating Therapist

Miss Jazz Fox,
Wheelchair & Seating Therapist
Auckland District Health Board, Auckland, New Zealand
Mrs Liz Turnbull,
Service Manager
Geneva Healthcare – Seating To Go

Learning objectives

1. Understand wheelchair and seating practice in the context of Aotearoa, New Zealand and develop an appreciation of the Māori world view and how this complements holistic practice.
2. Be able to implement a theoretical model into their everyday practice based on Te Whare Tapa Whā but with a wheelchair and seating focus.
3. Become familiar with Te Waka Oranga as a goal setting and care planning tool that could add to their clinical tool kit.

Abstract

When working with clients who have complex postural management and mobility needs, wheelchair and seating practitioners are required to draw on all aspects of a person in order to provide the best and most suitable solution for them. Our organisation's values are Welcome (Haere Mai), Respect (Manaaki), Together (Tuhono) and Aim High (Angamua). These values underpin our service delivery and clinical practice.

As a Māori Occupational Therapist practicing in wheelchairs and seating, the development of a guiding model that merges Western and Māori perspectives is important. The model Te Whare Tapa Whā developed by Professor Sir Mason Durie identifies that the Māori world view has four key elements that require attention to achieve an optimal health outcome. Taha Whānau , Taha Wairua, Taha Tinana, Taha Hinengaro are the corner stones of wellbeing and offer a unified holistic theory of health. These four corner stones are represented by the four pillars of a wharenui. If one cornerstone does not have structural integrity, the building will collapse.

Using Te Whare Tapa Whā as a guide, a complementary model was developed that leads wheelchair and seating practitioners through their journey and experience with clients as they work towards a wheelchair and seating solution. The model encourages a depth of thinking that can lead to successful clinical outcomes for Māori and all of our clients.

A case study will be shared to introduce the model which is based on a broader representation of a house and how to develop an effective clinical relationship. The client and their whānau open their home to us both literally and figuratively. The therapist steps across the threshold and establishes whanaungatanga (a relationship, belonging and connection between people and communities) with the client. In addition a Māori world view goal setting model will be introduce as a complimentary tool.

Content references:

1) Auckland District Health Board. (2019). *Te Tino o mātou – Us at our best.*
2) Curtis, E., Jones, R., Tipene-Leach, D. (2019). Why cultural safety rather than cultural competency is required to achieve health equity: a literature review and recommended definition. *International Journal for Equity in Health 18*(1), 174. https://doi.org/10.1186/s12939-019-1082-3
3) Durie, M. (2017). *Māori health models – Te Whare Tapa Whā*. Ministry of Health.

https://www.health.govt.nz/our-work/populations/maori-health/maori-health-models/maori-health-models-te-whare-tapa-wha
4) Durie, M. (1994). *Whaiaora: Māori health development*. Auckland, NZ: Oxford University Press.
5) Elder, Hinemoa. (2013). Te waka oranga: An indigenous intervention for working with māori children and adolescents with traumatic brain injury. *Brain Impairment, 14*(3), 415-424. doi: 10.1017/Brlmp.2013.2
6) Elder, H. (2017). Te waka kuaka and te waka oranga. Working with whānau to improve outcomes. *Australian and New Zealand Journal of Family Therapy, 38,* 27-42. doi: 10.1002/anzf.1206
7) Robson, B., & Harris, R. (2007). *Hauora*: *Māori Standards of Health IV. A study of the years 2000-2005*. Wellington: Te Rōpū Rangahau Hauora a Eru Pōmare.
Schell, B. A. B. (2014). Professional reasoning in practice. In B. A. B. Schell, G. Gillen, & M. Scaffa (Eds). *Willard and Spackman's occupational therapy* (12th ed, pp. 384-397). Baltimore, MD: Lippincott Williams & Wilkins.
Te Tiriti o Waitangi, 1840. http://www.treatyofwaitangi.maori.nz/
8) Townsend, E.A., & Polatajko, H.J. (2007). *Enabling Occupation II: Advancing an occupational therapy for health, well-being, & justice through occupation* (2nd ed.). CAOT Publications ACE.

Presenter biography

Jazz Fox has been working at Mobility Solutions since graduating from AUT in 2018 as an Occupational Therapist. Jazz and her whānau are affiliated to the iwi - Te Aupōuri which is located in the far north of Aotearoa. While working at Mobility Solutions, she has gained a passion for wheelchair and seating and has developed an interest and strong commitment for improving Māori health outcomes.

Liz Turnbull was the Team Leader for Mobility Solutions, Wheelchair and Seating service for people with complex needs in the greater Auckland region prior to moving to a new role as Service Manager for Geneva Healthcare – Seating To Go. Liz graduated in 1997 and has worked in NZ and the UK in a number of different fields. She is a member of the national Enable Panel for the credentialing of therapists in Wheeled Mobility and Postural Management – Level 2 and complex custom fabrication. Liz joined the Mobility Solutions team in 2005 when her keen interest in working with people to achieve wheelchair and seating outcomes that support them to accomplish their goals was ignited. Since then she has worked clinically and in leadership, mentoring and supervising the team. She has been involved extensively in service development, working groups and professional forums with Auckland DHB, the Ministry of Health and Accessable.

B18: Can the prescription of a mobility device facilitate increased connection to one's community?

Ms Tracee-lee Maginnity
Permobil, Sydney, Australia
Clinical Education Specialist

Learning objectives

- By end of this session attendees will be able to identify at least 3 barriers to community access for wheelchair users
- Identify at least one feature of a mobility base that will enhance community access
- Compare at least two mobility base options in relation to community access

Abstract

Can the prescription of a mobility device facilitate increased connection to ones community? Access to the Urupa (burial ground) for a Kaumatua (Maori elder) enables participation in the conclusion of a tangi (funeral) and ongoing connection to tupuna (ancestors). In many areas the location of this sacred ground will involve traversing terrain beyond the capacity of a standard mobility base. There is an abundance of evidence in the literature that supports the importance of appropriate wheelchair configuration of the wheelchair to an individual's needs for increased functional and participation outcomes. Experience and critical analysis of the capacity of a wheeled mobility device also reveals the external environmental barriers that exist for wheelchair users. Whilst funding criteria is specific to a country or region, most models are based around ensuring access to essential mobility needs, a basic human right. Unfortunately, this sometimes means that a users primary mobility device will not enable them to access environments that may hold significant cultural or personal value.

This session will look at how we can identify and assess different mobility base options and configurations to enable users to access and connect with their community. We will highlight some of the mobility barriers identified by users in several studies found in the literature and explore ways we can addresses increased participation in meaningful activities and tasks with the support of appropriately matched mobility solutions.

Real life case studies where the users' mobility goals include remote and rural access to home and community will demonstrate some situations where an additional purpose specific feature add on or device has enabled meaningful participation.

Content references:

Smith EM, Sakakibara BM, Miller WC; A review of factors influencing participation in social and community activities for wheelchair users. Disability Rehabilitation Assistive Technology. 2016;11(5):361-74

Pettersson I, Törnquist K, Ahlström G. The effect of an outdoor powered wheelchair on activity and participation in users with stroke. Disability Rehabilitation Assistive Technology. 2006 Sep;1(4):235-43

Giesbrecht EM, Ripat JD, Quanbury AO, Cooper JE. Participation in community-based activities of daily living: comparison of a pushrim-activated, power-assisted wheelchair and a power wheelchair. Disabil Rehabil Assist Technol. 2009 May;4(3):198-207.

Menzies A, Mazan C, Borisoff JF, Mattie JL, Mortenson WB. Outdoor recreation among wheeled mobility users: perceived barriers and facilitators.Disabil Rehabil Assist Technol. 2020 Jan 15:1-7.

Rice IM, Wong AW, Salentine BA, Rice LA. Differences in participation based on self-esteem in power and manual wheelchair users on a university campus: a pilot study

Disabil Rehabil Assist Technol. 2015 Mar;10(2):102-7.

Presenter biography

Tracee-lee Maginnity joined Permobil Australia in July 2019, as a clinical education specialist. Originally from New Zealand, she graduated Auckland University of Technology with a BHSc (Occupational Therapy) in 2003 and has since worked in various roles related to seating and mobility including assessing, prescribing and educating. After gaining experience as an assessor and prescriber at Seating To Go / Wheelchair Solutions in prescribing for both disability and injury, she moved to Australia in 2011 to take on the Senior Occupational Therapist role in a custom moulded seating service. She then worked in clinical consulting and education roles until joining Permobil. Tracee-lee is passionate about maximising functional outcomes with end users and the importance of education within the industry. She has mentored many therapists interested in AT. Her experience includes working with complex postures to achieve custom outcomes.

C19: Balancing the options – Managing Pelvic Obliquity in Seating

Ms Angela Rowe[1], Ms Kim Vien[2]
[1]Melbourne Health, Melbourne, Australia.
[2]Melboure Health, Melbourne, Australia
Ms Angela Rowe, Physiotherapist
Ms Kim Vien, Occupational Therapist

Learning objectives

1. To be able to measure pelvic obliquity objectively both postural and pressure interface mapping perspectives
2. To identify the causes and evaluate the impact of pelvic obliquity
3. To identify strategies to manage pelvic obliquity in seating

Abstract

Have you ever followed the "recipe" and not got the desired outcome? Our definitions of fixed and flexible postures can often limit our thinking and problem solving when managing posture and setting up AT solutions in seating.

We will do a deep dive into the topic of pelvic obliquity including a discussion around the assessment process involving postural and pressure measures. We will examine the causes and impact of Pelvic Obliquity on pressure injury risk, postural changes, self-propulsion efficiency, and everyday function. We will demonstrate how we assess and clinically reason through a number of video case studies. A number individualised AT solutions and the evaluation of outcomes will be presented. This will spark a debate regarding the management posture vs pressure and expand on the traditional ideas of correction vs accommodation.

Angela (Physiotherapist) and Kim (Occupational Therapist) are part of a specialist multidisciplinary seating team as part of the Young Adults Transition clinic at Melbourne Health. Our model of service allows input from differing clinical perspectives that can allow for more developed AT solutions.

Content references:

1) Lange, M & Minkel, J (2018) *Seating and wheeled mobility: a clinical resource guide*
2) Thorofare, NJ: Slack Incorporated
3) Waugh, K. *A clinical application guide to standardized wheelchair seating measures of the body and seating support surfaces*. University of Colorado/Assistive Technology Partners. Denver, Colorado. Revised edition August 2013 https://www.ncart.us/uploads/userfiles/files/GuidetoSeatingMeasuresRevisedEdition.November2013.pdf
4) Pope, P (2006) *Severe and Complex Neurological Disability Management of the Physical Condition*, Butterworth-Heinemann, Great Britain Farley, R, Clark, J, Davidson, C, Evans, G, MacLennan, K, Michael, S, Morrow, M, Thorpe, S (2003) *What is the evidence for the effectiveness of postural management?* International Journal of Therapy & Rehabilitation. Oct 2003, Vol. 10 Issue 10, p449-455. 7p.

Presenter biography

Angela Rowe is a physiotherapist with over 20 years of experience, predominantly in the fields of neurology and disability. She has completed post graduate studies in the field of Postural Management and worked as a Postural Management therapist at The Royal Hospital for Neuro-disability in London. Since returning to Melbourne, Angela has worked in two Wheelchair and Seating Services at The Royal Melbourne Hospital and Monash Health. Angela has co-authored a Wheelchair organisational standard at Monash Health and been involved in various research projects and conference presentations with her Wheelchair

and Seating clinic team. She has a particular passion for upskilling other therapists and has led training workshops and provided mentorship. Angela also has her own business Postural Innovations which provides bed positioning assessments, wheelchair consultations, and a product range of postural supports for 24 hour positioning.

Kim Vien is a Senior Occupational Therapist working in the disability sector specialising in the area of seating and equipment prescription. Having been in the disability sector for over 10 years, Kim has presented on the topic of seating at the 2017 & 2019 Oceania Seating Symposiums and at multiple ATSA daily living expos. Kim graduated in 2005 from the University of South Australia and completed honors in health sciences. With further studies in access consulting, she has expanded her skills to understand the built environments and how consumers and their technologies can interact more effectively. She has worked in both hospital and community settings and is now focused on improving services for adults with disabilities and their assistive technology needs.

C20: Making a Success of Custom Moulded Seating

Kate Pain
GTK, Sydney, Australia
Assistive Technology Consultant

Learning objectives

On completion of this workshop, participants will be able to:

1. Describe key factors in selecting custom moulded seating as the most suitable postural support option.
2. Demonstrate awareness of potential barriers to success with custom moulded seating.
3. List strategies to ensure optimal outcomes for postural support, function and pressure care.

Abstract

Custom moulded seating can be perceived as expensive, involving a complex production process, with little opportunity to modify the system to adapt to changes in the user's needs [1]. The risks associated with inappropriate moulded seating are significant and can lead to poor outcomes for the wheelchair user and their support network.

In this presentation, we will explore the decision-making process around choosing custom moulded seating, including best practice seating assessment [2,3]. We will discuss challenges that can arise during the casting, manufacturing and fitting process [1,4]. Strategies to ensure successful application of custom moulded seating will be explored, using case studies to illustrate these strategies, particularly in relation to achieving participation and functional goals.

Content references:

1) Dimiao, J.A. (2020). A Review of Factors, Seating Design, and Shape Capture Methods For Reducing Pressure Injury Risk (Unpublished doctoral dissertation). Virginia Commonwealth University, Richmond, Virginia.
2) Isaacson, M. (2011) Best Practices by Occupational and Physical Therapists Performing Seating and Mobility Evaluations, Assistive Technology, 23:1, 13-21, DOI: 10.1080/10400435.2010.541745
3) Minkel, J. (2018). Seating and Mobility Evaluations for Persons With Long-Term Disabilities: Focusing on the Client Assessment. In M. Lange & J. Minkel (Eds.), Seating and Wheeled Mobility: A Clinical Resource Guide (pp. 3–7). Slack.
4) Nace, S., Tiernan, J., & Ní Annaidh, A. (2019). Manufacturing custom-contoured wheelchair seating: A state-of-the-art review. Prosthetics and Orthotics International, 43(4), 382-395.

Presenter biography

Kate Pain is an Occupational Therapist, specialising in wheelchair seating and positioning, in her role as Assistive Technology Consultant with GTK (Sydney, Australia). Kate completed her Bachelor of Applied Science (Occupational Therapy) at the University of Sydney in 1999 and has gained experience in both Australia and the United Kingdom in a variety of settings including hospitals, rehabilitation units, community and private practice. Kate has focused on wheelchair seating and positioning for children and adults with complex postural support and pressure care requirements over the past decade.

D22: Understanding the lifespan postural issues of non-ambulant adults with CP, as measured with the Goldsmith Indices of Body Symmetry.

CHOLMES[1,2],
[1]Monash University, Peninsula Campus, Melbourne, Australia; [2]St. Vincent's Hospital Melbourne,
Melbourne, Australia

Learning objectives:

Upon completion of this session participants will be able to:

1. Understand the use of the Goldsmith Indices of Body Symmetry in the measurement of postural asymmetry of the thoracic cage, pelvis and hips
2. Identify postural deterioration using the GIofBS across the lifespan of non-ambulant adults living with CP
3. Identify pain behaviours and the contribution of postural asymmetry to pain in non-ambulant adults with cerebral palsy with cognitive and communication limitations

Abstract

Non-ambulant adults with CP often require customised seating and bed positioning systems to provide adequate postural support, maximise comfort and function and reduce the risk of pain and pressure injury. These postural interventions are readily available, yet adequate measurement of the complex three-dimensional rotary postural asymmetries experienced by many non-ambulant adults with CP, to guide and monitor prescription of such interventions has been lacking. The measurement, monitoring, and management of postural complications is critical given the impact on health and functioning inclusive of pain, quality of life, function, carer burden and life expectancy. A lack of consensus regarding appropriate clinical postural measurement in non-ambulant adults with CP has been identified alongside limitations due to patient complexity.
The GIofBS can be used to measure and monitor postural asymmetries of thorax, pelvis and hips, providing clinicians with relevant objective postural information upon which to base postural interventions.
Repeated and regular postural measurement using the GIofBS can demonstrate whether musculoskeletal asymmetries are static or changing in this population. This approach may be useful for screening for deterioration in musculoskeletal status or for assessing the longer-term outcomes of interventions to stabilise or improve postural asymmetries in lifespan management of this complex population.
The incidence and severity of pain in non-ambulatory adults with CP is high and may be associated with postural asymmetries. Proxy reporting, despite limitations, may remain the best option to assess pain in adults with significant cognitive and communication impairments and gain an understanding of the relationship between posture, as measured with the GIofBS, and pain.
This workshop will present data on the use of the GIofBS to monitor progression of postural asymmetry and describe the relationship between postural asymmetry and pain in a group of non-ambulant adults with cerebral palsy attending a tertiary multidisciplinary healthcare service.

Content references:

1) Tosi LL, Maher N, Moore DW, Goldstein M, Aisen ML. Adults with cerebral palsy: a workshop to define the challenges of treating and preventing secondary musculoskeletal and neuromuscular complications in this rapidly growing population. Dev Med Child Neurol. 2009;51(supplement):2-11.
2) Haak P, Lenski M, Cooley Hidecker M, Li M, Paneth N. Cerebral palsy and aging. Dev Med Child Neurol. 2009;51(04):16-23.

3) Morgan P, Enticott J, Nikam R, Tracy J. Profile of hospital admissions for adults with cerebral palsy: a retrospective cohort study. Dev Med Child Neurol. 2020.
4) Bromham N, Dworzynski K, Eunson P, Fairhurst C. Cerebral palsy in adults: summary of NICE guidance. BMJ. 2019;364:l806.
5) Holmes C, Brock K, Morgan P. Postural asymmetry in non-ambulant adults with cerebral palsy: a scoping review. Disabil Rehabil. 2018;41(9):1-10.
6) Goldsmith E, R. G, R. G, W. M. A technique to measure windswept deformity. Physiotherapy. 1992;78(4):235-242.
7) Holmes C, Fredrickson E, Brock K, Morgan P. The intra and inter-rater reliability of the Goldsmith Indices of Body Symmetry in non-ambulant adults with cerebral palsy. Disabil Rehabil. 2020.
8) Simple Stuff Works. Anatomical Measuring Instrument Goldsmith Indices of Body Symmetry 2018; http://www.measurepositionprotect.com. Accessed 1 Jan 2018, 2018.
9) Holmes C, Kim Brock & Prue Morgan (2020): Progression of Postural Asymmetry in Young Adults with Cerebral Palsy who are Non-ambulant: An exploratory study, Pediatric Physical Therapy, In Press, DOI: 10.1097/PEP.0000000000000787
10) Ryan JM, Peterson MD, Ryan N, Smith KJ, O'Connell NE, Liverani S, et al. Mortality due to cardiovascular disease, respiratory disease, and cancer in adults with cerebral palsy. Developmental Medicine & Child Neurology. 2019;0(0).
11) Rodby-Bousquet E, Czuba T, Hagglund G, Westbom L. Postural asymmetries in young adults with cerebral palsy. Developmental Medicine & Child Neurology. 2013;55(11):1009-15.
12) Casey J, Rosenblad A, Rodby-Bousquet E. Postural asymmetries, pain, and ability to change position of children with cerebral palsy in sitting and supine: a cross-sectional study. Disability and Rehabilitation. 2020:1-9.
13) Holmes C, Kim Brock & Prue Morgan (2021): The relationship between radiographic and anthropomorphic measurements of deformity of the thorax, hips and pelvis in adults with cerebral palsy. New Zealand Journal of Physiotherapy, In Press, DOI: 10.15619/NZJP/49.1.03
14) Peterson MD, Gordon PM, Hurvitz EA. Chronic disease risk among adults with cerebral palsy: the role of premature sarcopoenia, obesity and sedentary behaviour. Obesity Reviews 2013;14:171-82.

Presenter biography

Carlee Holmes is the senior physiotherapist in the Young Adult Complex Disability Service (YACDS) at St. Vincent's Hospital Melbourne and also works in private neurological practice. The YACDS is a transition service from paediatric to adult healthcare for young adults with complex medico physical disabilities including cerebral palsy.
Carlee has a particular interest in the measurement of postural asymmetry in non-ambulant adults with cerebral palsy and is currently completing a PhD investigating "Assessment and Management of the common postural characteristics in young adults with Cerebral palsy". She has also gained additional certification in Postural Care and Measurement of Body Symmetry.
Carlee is a research associate for CP Achieve and involved in the consumer working group. She is also a member of the American Academy for Cerebral Palsy and Developmental Medicine Lifespan Care Committee

D23: Managing Forces in Active Bodies. Dynamic Seating from Theory to Practice.

Ms Amy Bjornson, Mr Robert Norman
Sunrise Medical, Sydney, Australia
Ms Amy Bjornson, Clinical Director
Mr Robert Norman, Product Specialist Clinical Hub

Learning objectives

1. State 3 clinical assessment findings for when dynamic seating should/shouldn't be considered.
2. Demonstrate at least 3 important components that can be prescribed for dynamic seating.
3. List 2 research findings that support dynamic seating which can be used for justification.

Abstract

Often clinicians experience difficulty keeping clients stable and safe in their wheelchairs if they have higher tone, dystonic movement patterns or behavioural episodes.

With this in mind, dynamic seating was developed. This type of seating provides movement within individual components of a wheelchair in efforts of allowing the client to "move" and then return to a good sitting posture. Components can include leg rests, headrest components, back rest assemblies or complete seating systems.

When the client moves, the dynamic seating components move with the client, maintaining client alignment within the seating system. These dynamic components absorb and spread the force, assisting with posture protection and safety of the client as well as protecting the wheelchair from potential damage. Research on these components has found that clients can experience a reduction in muscle tone, decrease in agitation and enhanced comfort.

This workshop will investigate the research that has led to component development, the clinical assessment process required for dynamic seating and how to utilize the components currently to increase sitting tolerance, function and client well-being.

Content references:

1) Cimolin V, Piccinini L, Avellis M, Cazzaniga A, Turconi AC, Crivellini M, Galli M. 3D-Quantitative evaluation of a rigid seating system and dynamic seating system using 3D movement analysis in individuals with dystonic tetraparesis. Disabil Rehabil Assist Technol. 2009 Nov;4(6):422-8.
2) Angsupaisal M, Maathuis C G B, Hassers-Algra M, Adaptive seating systems in children with severe cerebral palsy across International Classification of Functioning, Disability and Health for Children and Youth version domains: a systematic review, Dev Med Child Neurol 2015, 57:919-931
3) Crane, B. A., Holm, M. B., Hobson, D., Cooper, R. A., & Reed, M. P. (2007). A dynamic seating intervention for wheelchair seating discomfort. American Journal of Physical Medicine & Rehabilitation, 86(12), 988-993.

Presenter biography

Robert is a seating and mobility product specialist in Australia and is currently working in the Sunrise Medical Clinical Hub. Robert has 17 years of experience in seating and mobility industry in the UK as well as Australia for the last 5 years. His past experience is as a Technical Trainer at JCM seating in the UK, Pediatric Product Specialist for Hewerdines in the UK, working with a children's charity. Robert has also worked for equipment suppliers in Australia with his prior role as a senior AT Consultant. Robert has presented Nationally in Australia on various seating and mobility topics.

Amy trained as a Physical Therapist in the United States, Amy has over 20 years' experience working with adult and pediatric neurologic populations, with specialties in the treatment of spinal cord injury, and provision of assistive technology for clients with physical challenges.

Based in Sydney, Amy currently develops and implements national and international training programs on using Assistive Technology to enhance inclusion, health and well-being in those with physical disabilities. She also serves a product improvement and development role for Sunrise Medical, Australia.

Amy is a dynamic speaker who has lectured extensively on seating and mobility. She has also travelled to several developing countries, learning and sharing information with their medical communities.

Amy received her ATP certification in 1995, SMS certification in 2015 and Australian Physiotherapy certification in 2018. She is an active member of Wheelchairs for Humanity, Health Volunteers Overseas and offers technology support to Hidden Treasures Home, Fuzhou China

CLOSING KEYNOTE

Innovation or Improvement? What is the potential for the Fourth Industrial Revolution (Industry 4.0) to influence the lives of people living in wheelchairs?

Rachael McDonald
Co-Director, MedTech Vic
Professor and Chair, Department of Nursing and Allied Health
Swinburne University, Victoria, Australia

Learning outcomes:

1. Understand the role of industry 4.0 in wheelchair and technology design
2. Describe where user centred design fits within wheeled mobility and seating developments
3. Become excited by and engaged in how we can all be part of innovations in wheeled mobility and seating.

Industry 4.0 is the name for the 'Fourth Industrial Revolution". This represents a significant transformation in the way products are produced due to the digitalisation of manufacturing, and builds on the first (mechanisation through water and steam power), the second (mass production and assembly lines using electricity), the third (adoption of computers). Industry 4.0 extends these developments through the new technologies that have been made possible due to computing. Words such as 'artificial intelligence', 'machine learning', 'digital twinning' are all phrases discussed widely in the media as innovations, but what do they mean for people interested in wheelchairs?

According to the Harvard business review "Innovation is *the* buzzword. In fact, it has been the buzzword for so long, you could say we've developed a cult around it" (1). Innovation is a word that is overused and often also used incorrectly. It builds excitement and is synonymous with 'something cool'. At the same time, the design of the wheelchair has fundamentally not changed throughout the 20th and 21st centuries. That said, recently major improvements have been made such as the freewheel or smart drive, and this has often enhanced user experience (2).

However, many of these enhancements are inaccessible to the majority of the 131 million wheelchair users worldwide, and whilst improvements, are they innovation? What is it that is needed to be innovative in wheeled mobility and seating? And who does this? To be truly innovative, designing for and by people who use wheeled mobility is the most innovative, and the most difficult. Academics and practitioners have been writing about user centred design and disability since the early 1990's (3), yet it is still not commonplace.

This presentation will de-mystify some of the language around Industry 4.0 and demonstrate applications for wheelchairs and seating that are not only innovative, but are led by people who use wheelchairs, partnered with the people who can support that development.

References:

1. Zhexembayeva, N. Stop calling it "Innovation". Harvard Business Review, February 19, 2020.

https://hbr.org/2020/02/stop-calling-it-innovation
2. Borisoff JF. Small markets in assistive technology: Obstacles and opportunities. In: Oishi MMK, Mitchell IM, Van der Loos HFM, editors. Design and Use of Assistive Technology: Social, Technical, Ethical, and Economic Challenges. Springer New York; 2010. p. 105.
3. Petrie, H. User centred design and evaluation of adaptive and assistive technology for disabled and elderly users. It- Information technology, 1997, 39(2): p7-12

Presenter Biography:

Rachael McDonald is clinical, teaching and research professor who aims to conduct research with people with disabilities to support and enable participation as well as educate the health professionals of the future. This is done by focussing on collaborative multidisciplinary research and teaching, concentrating on emerging areas of health, technology and emerging technologies and identifying, and addressing barriers.

They have over 100 publications, and attracted over $10million in research funding, and supervised 29 research students.