Oceania
SEATING 2019
SYMPOSIUM
Innovation Through Partnership

HANDBOOK

12–14 November 2019

Melbourne Cricket Ground, Australia

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SWINBURNE UNIVERSITY OF TECHNOLOGY

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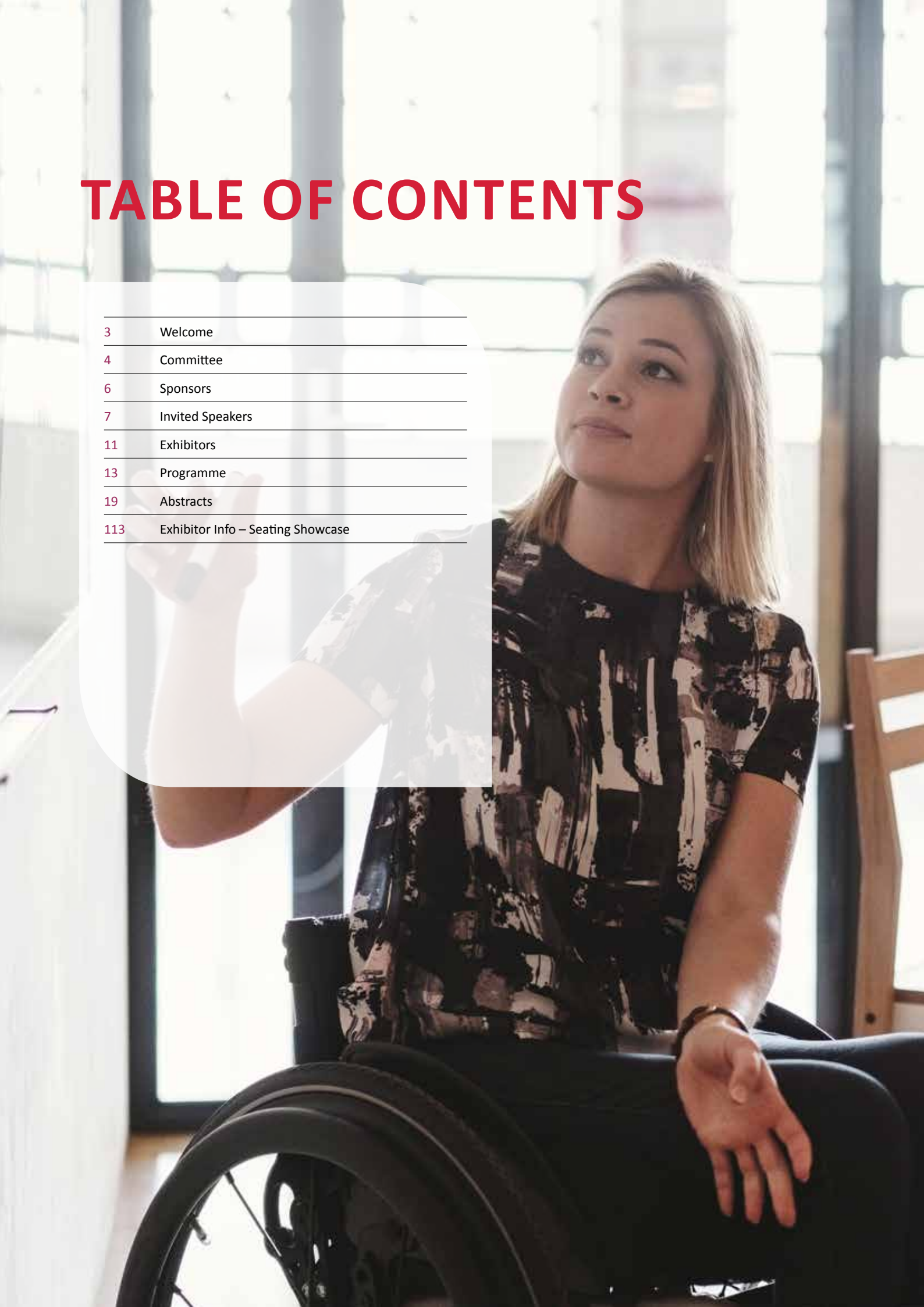

WELCOME

On behalf of the committee, we would like to warmly welcome you to the first Australian Oceania Seating Symposium, held at the Melbourne Cricket Ground, 12–14th November 2019. I would like to acknowledge the Traditional Custodians of the land on which we will be meeting, the Wurundjeri peoples of the Kulin Nation and pay respects to their Elders, past, present and future, and understand that the land was never ceded. We are very fortunate to be able to meet at the MCG which was a traditional meeting place of the people of the Kulin Alliance and was established in 1853 as the home of the Melbourne Cricket Club. The first cricket test match between Australia and England was played at the MCG in 1877. It was the site of the 1956 Olympic Games, the first in the Southern Hemisphere.

When the committee was looking at venues for the OSS, we were most interested in accessibility over history. You will notice near gate 3 on the ground floor a 'changing places' bathroom – that is, one which is fully accessible for all. This is one example of 'Innovation through Partnership'. The theme of the conference fully reflects our commitment to improving quality, access and supports for participation and wellbeing amongst people who use wheeled mobility and seating; as well as the need for collaboration, co-design and partnership.

We have had an amazing team to work with. Deb Wilson, who ran the first OSS in NZ in 2017 has been nothing but supportive, inspirational and an amazing colleague. Deb comes with much expertise and her lovely communications and media advisor Kayla Wilson who has been wonderful. Kayla is the consummate professional, and incredibly patient. Our team includes Lois Brown, Mal Turnbull, Kim Vien, Liz Nade, Bonnie Sawatzky, Andrew Congdon, George Ajaka and Lauren Flaherty. Despite everyone having amazingly busy lives, changing jobs and states and having babies during the lead up to the conference, this amazing group of individuals have worked tirelessly to bring the conference to fruition. Our symposium mangers – Convention Management NZ Ltd have been amazing, and Lu Budden has not only saved my bacon but been extremely calm and patient with her over committed and scatty Australian Chair. I would also like to acknowledge Rob McMahon, research coordinator for FHAD who has helped me to manage everything, but particularly books and invoicing, and Joshua Ameliorate who did the artwork.

I would like to acknowledge the fantastic support we have received from the Faculty of Health, Arts and Design at Swinburne University of Technology. Professor Scott Thompson-Whiteside provided support in both seed funding but also encouragement and belief in the conference. Professor Janet Hiller and then Professor Bruce Thompson as Deans of Health Science also fully supported both the conference and my time.

So welcome, all delegates, speakers, exhibitors and sponsors. Thank you to all our sponsors, Platinum Plus Sponsor Paragon Mobility, our first and Platinum Sponsor Permobil and Gold Sponsor Invacare. We would be unable to run the conference without all our partners and we hope that this is a productive, innovative and special conference for all. Don't forget that there is time for the public to attend the exhibition also on Thursday afternoon.

We have an amazing array of keynote, plenary and invited speakers, who will educate and inspire us. Special events at this conference include a demonstration of a 'new' sport – Wheelchair Australian Football League by Brendan Stroud, Captain Coach and Best and Fairest medal winner of the Collingwood football team on Thursday afternoon before the Conference Dinner. The conference dinner is in the Maurice Rioli room at the Richmond Football Club, with the Djirri-Djirri dancers providing cultural dance, followed by the McSmiths to help us party into the night.

Everyone attending is passionate about this area, and we encourage you to make the most of the education, networking and all other opportunities. Enjoy OSS 2019 (and see you in NZ in 2021!)

Rachael McDonald
Australian Chair OSS

OSS 2019 COMMITTEE

Rachael McDonald (Australian Chair)

PhD OT, Associate Professor, Chair of the Department of Health and Medical Science, Swinburne University of Technology, Melbourne, Australia

George Ajaka

General Manager, GTK, Sydney, Australia

Debbie Wilson (New Zealand Chair)

BappScOT, NZROT, Managing Director & Clinical Specialist, Seating to Go, New Zealand

Lauren Flaherty

Programme Director, Motivation Australia, Adelaide, Australia

Andrew Congdon

B.App.Sc OT, Assistive Technology Lab, (AT LAB), Darwin, Australia

Lois Brown

MPT, ATP/SMS, Clinical Manager, Rehabhire, Melbourne, Australia

Bonita Sawatzky

PhD, Associate, Professor, Orthopaedics, Univerity of British Columbia, Vancouver, Canada

Mal Turnbull

Senior Advisor, Permobil, Sydney, Australia

Elizabeth Nade

Consultant, Assistive Technology at Cerebral Palsy Alliance, Australia

Kim Vien

Occupational Therapist, Royal Melbourne Hospital

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KEYNOTE SPEAKERS

KEYNOTE
MELANIE TRAN

HOW OPPORTUNITIES CAN BE CREATED THROUGH DESIGN AND TECHNOLOGY

Melanie Tran is currently a student at Torrens University Australia, studying Bachelor of Digital Media with a major in Interaction Design. Melanie has a particular interest in UX (User Experience) Design. Melanie brings her skills and expertise as a UX Designer into the disability, health and technology sectors. With over seven years experience working in the disability and technology sectors, Melanie had the opportunity to further develop her skills and knowledge as a UX Designer. Melanie is currently working as a UX Designer at AbilityMade and Hireup. She is also a Board Member at LeepNGO –an organization that focuses on addressing the digital divide in the disability and aged care sectors. In 2017, Melanie was selected as one of the Laureate Global Fellows –an international fellowship for young social entrepreneurs. Melanie is also the first person in the world with a neuromuscular condition to complete The Duke of Edinburgh's International Award –she is the recipient of the Bronze, Silver and Gold Award. Following from the success of The Duke of Edinburgh's International Award, Melanie became a public speaker and spoke at many events including TEDxYouth@Sydney.

PLENARY SPEAKERS

ASSOCIATE PROFESSOR
LISA KENYON

THE POWER OF SELF-GENERATED MOBILITY: PROVIDING EARLY MOBILITY EXPERIENCES FOR INFANTS AND TODDLERS

Dr. Kenyon is an Associate 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 Committee of Content Experts for the Pediatric Specialty Council of the American Board of Physical Therapy Specialties

PROFESSOR
HUNG NGUYEN

AVIATOR – A SMART WHEELCHAIR

Professor Hung Nguyen is Pro Vice-Chancellor for the Faculty of Science, Engineering & Technology at Swinburne University of Technology. Giving people with severe disability greater independence and control has been the central aim of his working life for the past 20 years. Specialising in the field ofmedical inventions, Hung is responsible for Aviator, the smart thought-controlled wheelchair, which is designed to improve the lives of paraplegics and quadriplegics, especially for those unable to use their hands. His other inventions include a non-invasive diabetes monitoring system, and a system for monitoring and preventing driver fatigue. Hung was appointed a Member of the Order of Australia in 2002 and was awarded the 2016 Chancellor's Medal for Exceptional Research at the University of Technology Sydney (UTS). He was Assistant Deputy Vice-Chancellor (Innovation) (2014-2017) and Dean of the Faculty of Engineering and Information Technology (2010-2014) at UTS, and was Founder/Executive Director of AIMedics Pty Ltd (2001-2006). He is a Fellow of the Institution of Engineers, Australia, the Australian Computer Society and the British Computer Society

PLENARY SPEAKERS

DR HARRY EEMAN

THE INTERSECTION OF PAIN AND DISABILITY

Harry was a young medical student when he was struck down by a severe form of Gillian Barre Syndrome whilst backpacking in Europe. He spend the next 2½ years in hospital, 5 months of which were spent on a ventilator, paralysed in what externally presented as a coma-like state except that he could hear those around him. After years of rehabilitation he recommenced his studies and completed medicine as a quadriplegic which required overcoming a number of physical and attitudinal barriers. Eventually he graduated with honours and subsequently completed two postgraduate specialist qualifications. He hopes to be able to inspire people who face similar obstacles in their lives by working as a Rehabilitation Medicine Physician. He also works to empower people suffering from chronic pain and is now the acting Clinical Director of a large chronic painmanagement unit in a major metropolitan in hospital in Melbourne. All of this he juggles with living independently and trying to be the best father he can be to his two year old son.

PROFESSOR
JOHN POLLAERS OAM

John Pollaers has a proven track record in leading major Australian and international companies including Pacific Brands and Foster's Group, and in his current roles is working across Government to bring about major reforms to vocational education and training and aged care. This is a realisation of his vision of building a strong future for Australia by creating opportunities for people and businesses to flourish and succeed. He is a passionate advocate for education and training, the care of senior Australians and including more people with disability in work and training. John is Chair of the Australian Industry and Skills Committee, and the Australian Advanced Manufacturing Council. He is the Chancellor of Swinburne University and is Executive Chairman of Leef Independent Living Solutions, an innovative functional health and assistive technology business with 14 Independent Living Centres nationally.

PLENARY SPEAKERS

CLOSING KEYNOTE

DR JAMES ARKWRIGHT

A RELATIONALLY RESPONSIVE REHABILITATION

Dr Arkwright has over thirty years' experience of professional partnerships, both as a consumer of rehabilitation and disability services and as a social practice professional and educator. Whenhe was twenty two years of age, James had a motor bike accident on a farm that resulted in him incurring tetraplegia. With his options seeming limited, he undertook a BA and then a Masters in Counselling.

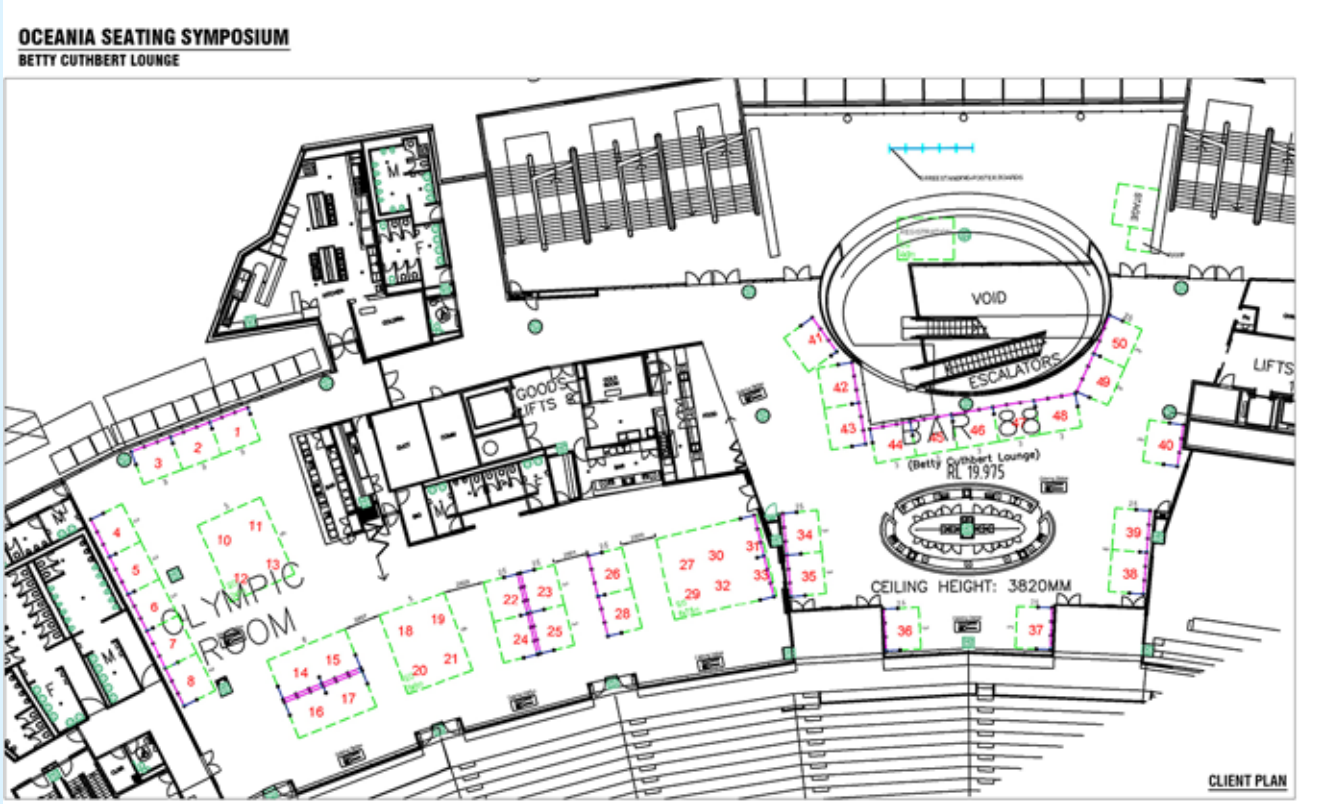
He has worked in the fields of disability services, rehabilitation, counselling and tertiary education. His doctoral thesis was in the area of illness/disability, and he has undertaken subsequent research in organisational change and inclusive education. He currently works at Bethlehem Tertiary Institute (NZ) where he is the Head of School for Social Practice, which includes the social work and counselling programmes. At OSS 2019, he is looking forward to bringing together his thirty plus years' experience as a wheelchair user with his professional commitment to strength-based and collaborative practices.

WORKSHOP SPECIALIST

KELLY WAUGH

PT, MAPT, ATP,is a Senior Research Instructor and the Clinic Coordinator at Assistive Technology Partners, a program in the Department of Bioengineering, University of Colorado Denver, USA. Ms. Waugh has 32 years of clinical experience as a physical therapist and educator, specialising in Wheelchair Seating & Mobility and Nighttime Positioning.Ms. Waugh has served on the ISO Wheelchair Seating Standards Committee for 17 years, with a focus on the development of standardised measures of wheelchair seated posture and seating support parameters. She is the primary author of A Clinical Application Guide to Standardized Wheelchair Seating Measures of the Body and Seating Support Surfaces. Ms. Waugh received both her B.A. degree in Human Biology and her M.A. degree in Physical Therapy from Stanford University in Stanford, California, USA.

EXHIBITORS



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MONDAY 11th & TUESDAY 12TH NOVEMBER

*Preliminary Programme – Subject to change

MONDAY 11th NOVEMBER	
15.30 – 17.00	**Registration**

TUESDAY 12th NOVEMBER				
8.00	**Registration & Exhibition Hall opens**			
9.00	**Welcome & Opening Ceremony**			
9.30	**Keynote:** *How Opportunities Can Be Created Through Design and Technology* **– Melanie Tran (Australia)**			
10.15	**Plenary:** *The Power of Self-generated Mobility: Providing Early Mobility Experiences for Infants and Toddlers* **Assoc. Prof. Lisa Kenyon (USA)**			
11.00-11.30	**MORNING TEA / POSTER SESSIONS / EXHIBITION SHOWCASE** – Olympic Room & Betty Cuthbert Lounge			
Session A **11.30-12.30**	**Paper 1** (12min + 3min Q&A)	**IS 1** (1-hour workshop)	**IS 2** (1-hour workshop)	**IS 3** (30min workshops)
11.30	***A1:*** *Standing Up for Yourself: Activity & Participation Benefits of Standing Wheelchairs* **Jenni Dabelstein (Australia)**	***A5:*** *Applying Clinical Outcome Measures to Mobility and Seating Assessments* Intermediate – Advanced **Lois Brown (Australia)**	***A6:*** *A Biomechanical Approach to Managing Abnormal Postures of the Head and Neck* Intermediate – Advanced **Kelly Waugh (USA)**	***A7:*** *Virtual Reality, Augmented Reality and Wheelchairs – what is the potential?* **Rachael McDonald (Australia)**
11.45	***A2:*** *Participatory Design to Develop and Evaluate a Monitoring System for Power Tilt-in-space Wheelchairs* **Claudine Auger (Canada)**			
12.00	***A3:*** *From Supine to Sitting: The seating journey of a Syrian Refugee* **Kim Magnus (Canada)** **Lynore McLean (Canada)**			***A8:*** *Connected Care: Sensor-based assistive technology to transform the way wheelchair users manage their health* **Kath Hamilton (Australia)**
12.15	***A4:*** *Travelling overseas with a child with a disability: The experiences of two Adelaide families* **Julia Paterson (Australia)**			
12.30-14.00	**LUNCH / EXHIBITION SHOWCASE / DEMONSTRATION STAGE**			
Session B **14.00-15.00**	**Paper 1** (12min + 3min Q&A)	**IS 1** (1-hour workshop)	**IS 2** (1-hour workshop)	**IS 3** (2-hour workshop) **13.30-15.30**
14.00	***B1:*** *Identification of postural abnormality in young adults with cerebral palsy* **Carlee Holmes (Australia)**	***B5:*** *Wheelchair Prescription and Clinical Decision Making for a Client with a Functional Neurological Disorder* Intermediate – Advanced **Monique Lamerand (Australia)**	***B6:*** *A successful story of innovation through partnership: product design meets real client needs* Beginner – Intermediate **Joana Santiago (Australia)** **Laura Fleming (Australia)** **Luke Holmes (Australia)**	***B7:*** *The Foundations of Wheelchair & Seating: A practical solution to assessment and outcomes* Beginner – Intermediate **Meredith Miller (New Zealand)** **Alisha Parkin (New Zealand)** **Limited to 30 people** **Pre-booking required**
14.15	***B2:*** *Do older adults need wheelchair propulsion training? A single-subject research design* **Bonita Sawatzky (Canada)**			
14.30	***B3:*** *Effectiveness of a School-Based Wheelchair Skills Training Program for Youth* **Genevieve Daoust (Canada)** **Paula Rushton (Canada)**			
14.45	***B4:*** *Peer-led approaches for*			

	improving satisfaction with participation, wheelchair skills and self-efficacy among children who use manual and power wheelchairs **William C Miller (Canada)** **Debbie Wilson (New Zealand)**			
15.00-15.30	**AFTERNOON TEA / POSTER SESSIONS /EXHIBITION SHOWCASE** – Olympic Room & Betty Cuthbert Lounge			
Session C **15.30-17.30**	**IS 1** (1-hour workshops)	**IS 2** (1-hour workshops)	**IS 3** (1-hour workshops)	**IS 4** (1-hour workshops)
15.30	***C1:*** *Maximizing Propulsion Efficiency* Beginner – Intermediate **Jane Fontein (Canada)**	***C3:*** *Mobile Shower Commodes for users with spinal cord injury: an introduction to assessment and specification* Beginner – Intermediate **Emma Friesen** **(Canada / The Netherlands)**	***C5:*** *When Disability becomes a Force of Innovation: Designing for Social Change.* **Melanie Tran (Australia)** **Limited to 10 people** **Pre-booking required**	***C7:*** *What does the Wound Tell Us?* Beginner – Intermediate **Cathy Young (Australia)** **Kim Vien (Australia)**
16.30	***C2:*** *Moving Forward Together: A Framework for Alternative Drive Control Evaluation.* Intermediate – Advanced **Rachel Fabiniak (Australia)**	***C4:*** *What Large Data is Showing about the Impact of Mobility Assistive Equipment and Services* Intermediate – Advanced **Mark Schmeler (USA)**	***C6:*** *Enhancing Education of Wheelchair Service Providers: An Overview of Current Initiatives* Beginner – Intermediate **Paula Rushton (Canada)**	***C8:*** *Body Segment Angles: The key to Understanding Postural Deviations in the Sagittal Plane* Intermediate – Advanced **Kelly Waugh (USA)**
17.30-19.00	**WELCOME RECEPTION IN THE EXHIBITION HALL**			

POSTER SESSIONS FOR TUESDAY 12TH NOVEMBER

All posters will be up for the duration of the symposium. Authors will be available during morning tea and lunch breaks on the day allocated in the programme

P1: *Back Supports: Off the Shelf or Custom?*
Faith Savage (USA)

P2: *Exploring Postural Care: A Family- Centred Practice for Young Children with a Physical Disability*
Denise Luscombe (Australia)

P3: *An Innovative Approach to Providing Customised Commode Seating*
Jane Sander, Stacey Burr, Alex Hayes, Richard Sutton (Australia)

P4: *The Impact of Power Assist on a Wheelchair User*
Maria Whitcombe-Shingler (New Zealand)

P5: *Technician Certification – where are we at in New Zealand?*
Matthew Macpherson (USA)

WEDNESDAY 13TH NOVEMBER

Free public access to exhibition hall today between 1.30pm-2.30pm & 3pm-5pm

*Preliminary Programme – Subject to change

WEDNESDAY 13th NOVEMBER				
8.00	**Registration & Exhibition Hall opens**			
8.30	**Welcome & Introductions**			
8.45	**Plenary:** *Aviator - a smart wheelchair* – **Professor Hung Nguyen (Australia)**			
9.30	**Plenary:** *The intersection of pain and disability* – **Dr Harry Eeman (Australia)**			
10.15-11.00	**MORNING TEA / POSTER SESSIONS / EXHIBITION SHOWCASE** – Olympic Room & Betty Cuthbert Lounge			
Session D **11.00-12.00**	**Paper 1** (12min + 3min Q&A)	**IS 1** (30min workshops)	**IS 2** (30min workshops)	**IS 3** (1-hour workshop)
11.00	***D1:*** *Active Controls Centre Drive; The Biomechanical Benefits* **Lauren Hunter (Australia)**	***D5:*** *Power Fun: a therapeutic summer camp enabling children with severe disabilities learn powered mobility skills* Intermediate – Advanced **Lori Rosenberg (Israel)**	***D7:*** *Don't Let Back Supports Take the "Back Seat"; in a Seating Assessment* Beginner – Intermediate **Jane Fontein (Canada)**	***D9:*** *Customised Alternative Positioning for 24hr Postural Management* Intermediate – Advanced **Faith Savage (USA)**
11.15	***D2:*** *Validation of a Simulator for Powered Mobility for Children* **Naomi Gefen (Israel)**			
11.30	***D3:*** *Winter wheelchair accessibility: a web-based application* **Ed Giesbrecht (Canada)**	***D6:*** *Power Assist/Add On Manual Wheelchairs: What's the Go?* Intermediate **Amy Bjornson (Australia)**	***D8:*** *The use of lying supports with people over the age of 65* **Rachel Brown (New Zealand)**	
11.45	***D4:*** *Correlation of Trunk Control and Daily Activity/Participation after Adaptive Seating System Provision* **Rumrada Inthachom (Thailand)**			
12.00-13.30	**LUNCH / EXHIBITION SHOWCASE (PUBLIC ACCESS 13.30-14.30) / DEMONSTRATION STAGE**			
Session E **13.30-14.30**	**IS 1** (1-hour workshop)	**IS 2** (1-hour workshop)	**IS 3** (30min workshops)	**IS 4** (3-hour workshop)
13.30	***E1:*** *Paediatric powered mobility interventions across a range of abilities: the power to get going and enjoy life* **Lori Rosenberg (Israel)** **Naomi Gefen (Israel)**	***E2:*** *Do current wheelchair provision systems stifle innovation among practitioners to enable people to truly participate?* Intermediate – Advanced **Rosemary Joan Gowran (Ireland)** **Emma Friesen (Canada / The Netherlands)**	***E3:*** *Customised sporting equipment and seating: An innovative multi-discipline approach* Intermediate **Steven Wilson (Australia)** **Keren Faulkner (Australia)** **Matthew Crawford (Australia)**	***E5:*** *Body, Seating and Frame Measurements from Assessment to Delivery* Intermediate – Advanced **Kelly Waugh (USA)** **Lois Brown (Australia)** **This workshop runs 13.30-16.30** **Limited to 35 people** **Pre-booking required**
14.00			***E4:*** *What's going on under there? Shear force measured during powered wheelchair standing.* Intermediate **Megan Ransley (New Zealand)** **Erin Davis (New Zealand)**	
14.30	**AFTERNOON TEA / POSTER SESSIONS / EXHIBITION SHOWCASE (PUBLIC ACCESS 15.00-17.00)**			
Session F	**Paper 1**	**IS 1**	**IS 2**	

15.00-16.00	(12min + 3min Q&A)	(1-hour workshops)	(1-hour workshops)	
15.00	***F1:*** *Evaluating &implementing a web-based follow-up service for wheelchair users* **Claudine Auger (Canada)**	***F5:*** *Innovate to Participate: Beyond Body Structures and Function* *(Using sit-to-stand power wheelchairs to increase activity and participation)* Beginner – Intermediate **Kim Magnus (Canada)** **Lynore McLean (Canada)**	***F6:*** *Move it, Move it, Move It - You've Got To Move It. Dynamic Position Change Throughout the Day to improve Health, Inclusion and Happiness* Intermediate **Amy Bjornson (Australia)**	
15.15	***F2:*** *Bridging the gap in wheelchair skills testing and training in a Canadian paediatric rehabilitation context* **Genevieve Daoust (Canada)** **Paula Rushton (Canada)**			
15.30	***F3:*** *Collaboration towards improving the client journey: Health care resources, the highlights and final outcome* **Sandra Malkin (Australia)** **Colleen O'Brien-Malone (Australia)** **Jane Sander (Australia)**			
15.45	***F4:*** *What is remote? Living with a Spinal Cord Injury in the Northern Territory and the Delivery of Wheelchair and Seating Services.* **Andrew Congdon (Australia)**			
Session G **16.00-17.00**	**IS 1** (1-hour workshops)	**IS 2** (1-hour workshops)	**IS 3** (1-hour workshops)	
16.00	***G1:*** *Tipping the Balance - evaluating centre of gravity to optimise propulsion and stability* **Angela Rowe (Australia)** **Bill Contoyannis (Australia)** **Jesús Campo Uribe (Australia)**	***G2:*** *A Sustainable Spinal Seating Professional Development Program In NSW, The Outcomes And Challenges* Beginner – Intermediate **Charisse Turnbull (Australia)**	***G3:*** *Unlocking Potential: Providing Power Mobility Training for Children with Multiple, Severe Disabilities* **Lisa Kenyon (USA)**	
17.00 - 18.00	**ARATA AGM** **Exhibition wheelchair AFL match** - TBC			
19.00	**CONFERENCE DINNER – MAURICE RIOLI ROOM, SWINBURNE CENTRE AT PUNT ROAD OVAL** – Kindly supported by Invacare			

POSTER SESSIONS FOR WEDNESDAY 13TH NOVEMBER

All posters will be up for the duration of the symposium. Authors will be available during morning tea and lunch breaks on the day allocated in the programme.

P6: *Clinical Use of Custom Contoured Seating Systems for Adolescents with Postural Deformities: A Case Study*
Justine Harrigan (Canada)
Genevieve Daoust (Canada)

P7: *Collaborating to Provide a Seating Solution: When done well the results can be life changing!*
Kat Wyeth (New Zealand)

P8: *Considerations for Mobility Post Bilateral Posterior Deltoid to Triceps Tendon Transfer (Troids) Surgery in Tetraplegia.*
Katie Strachan (New Zealand)

P9: *Partnership with Rural Health Services via the use of Photogrammetry for Customised Postural Supports.*
Richard Sutton (Australia)
Jane Sander (Australia)

THURSDAY 14th NOVEMBER

*Preliminary Programme – Subject to change

THURSDAY 14th NOVEMBER				
8.00	**Registration & Exhibition Hall Opens**			
Session H **8.30-10.30**	**Paper 1** (12min + 3min Q&A)	**IS 1** (1-hour workshops)	**IS 2** (1.5-hour workshop)	**IS 3** (1.5-hour workshop)
8.30	***H1:*** *Experience of dynamic splinting as an adjunct to equipment for positioning and function; case studies* **Helen Thorne (New Zealand)**	***H5:*** *Identification, prevention and measurement of postural asymmetry* Intermediate – Advanced **Carlee Holmes (Australia)** **Denise Luscombe (Australia)**	***H7:*** *Mass Customization 3D Printing for Complex Rehab - Finding Common Threads for Point of Care Manufacturing* Beginner – Advanced **Richard Pasillas (USA)**	***H9:*** *Adding Shape and Dynamic Mobility to Enhance Stability!* Intermediate – Advanced **Sheila Buck (Canada)**
8.45	***H2:*** *Literature Review: Effect of Dynamic Splints on scoliosis management and QoL in a neuromuscular population* **Samantha Walsh (Australia)**			
9.00	(30min workshop) ***H3:*** *Measuring total shear forces to quantify the wheelchair setup* Beginner – Intermediate **Wim Hartog (Australia)**			
9.30	(1-hour workshop) ***H4:*** *Ready to Roll: Wheelchair skills training in preparation for clinical practice* Beginner – Intermediate **Ed Giesbrecht (Canada)** **Paula Rushton (Canada)**	***H6:*** *Looking Beyond RCTs: Improving Clinical Applicability and Rigour in Seating and Wheeled Mobility Research* **Lisa Kenyon (USA)** **William C Miller (Canada)**		
10.00			(30 min expert panel) ***H8:*** *Panel discussion on 3-D printing – what is current, new and where are the future possibilities?* **Dr Gianni Renda, Professor Blair Kuy, Hana Phillips (Australia)**	(30min workshop) ***H10:*** *Shock and vibration - Exploring methods to reduce the physiological and functional implications for wheelchair users* Intermediate – Advanced **Nick Reginato (Australia)**
10.30-11.00	**MORNING TEA / EXHIBITION SHOWCASE**			
Session I **11.00-12.00**	**IS 1** (1-hour workshop)	**IS 2** (1-hour workshop)	**IS 3** (1-hour workshop)	**IS 4** (1-hour workshop)
11.00	***I1:*** *Consumer-defined outcomes: applying the Assistive Technology Outcomes Framework applied to wheeled mobility and seating* Beginner **Natasha Layton (Australia)** **Carl Thompson (Australia)**	***I2:*** *Peer Mentored Wheelchair Skills Training - Let's get this thing going!* Beginner – Advanced **Wendy Hartley (New Zealand)** **Glenn McDonald (New Zealand)** **Beth Knight (New Zealand)**	***I3:*** *GAME ON! Adaptive Sports Innovation for Athletes with Complex Disability* **Kendra Betz (USA)**	***I4:*** *The Impact of MWC Propulsion: From the Paediatric to Adult Shoulder* Intermediate **Rachel Fabiniak (Australia)**
Session J **12.00-12.30**	**IS 1** (30min workshop)	**IS 2** (30min workshop)	**IS 3** (30min workshop)	**IS 4** (30min workshop)

12.00	***J1:*** *Stop the Migration! Pain Reduction Through Seated Posture* Beginner – Intermediate **Sheila Buck (Canada)**	***J2:*** *Postural Care in Aged Care* Beginner – Intermediate **Bas Jansen (Australia)**	***J3:*** *Paediatric Powered Mobility Outcome Measures: From Theory to Practice* **Naomi Gefen (Israel)** **Lori Rosenberg (Israel)** **Lisa Kenyon (USA)**	***J4:*** *It's a Big World Out There: Global Initiatives Applied to the Pacific Island Context* **Debbie Wilson (New Zealand)** **Lauren Flaherty (Australia)**
12.30-13.30	**FINAL LUNCH & NETWORKING / EXHIBITION SHOWCASE (CLOSES AT 13.30)**			
13.30	**Plenary: Professor John Pollaers (Australia)**			
14.10	**Closing Keynote:** *A Relationally Responsive Rehabilitation* **– Dr James Arkwright (New Zealand)**			
14.50-15.30	**CLOSING CEREMONY**			

ABSTRACTS
TUESDAY 12th NOVEMBER

Keynote: How Opportunities Can Be Created Through Design and Technology

Melanie Tran

Session description:
Designers have been trained to problem solve through the creative lens - but what role does design play in health? More importantly, how can design influence the disability sector? Sometimes it's not about reinventing the wheel or creating something completely new, but it's about leveraging one of the most powerful tools that surrounds us every single day - technology. How can we embrace the principles of access and inclusion, so that everyone has an equal chance to access all of the essential products and services within the disability sector? It's about understanding the regulations for accessibility and how we, as stakeholders in the disability sector, can push compliance to its boundaries through the power of creativity and empathy.

Speaker biography:
Melanie Tran is currently a student at Torrens University Australia, studying Bachelor of Digital Media with a major in Interaction Design. Melanie has a particular interest in UX (User Experience) Design. Melanie brings her skills and expertise as a UX Designer into the disability, health and technology sectors. With over seven years' experience working in the disability and technology sectors, Melanie had the opportunity to further develop her skills and knowledge as a UX Designer. Melanie is currently working as a UX Designer at AbilityMade and Hireup. She is also a Board Member at LeepNGO – an organization that focuses on addressing the digital divide in the disability and aged care sectors.

In 2017, Melanie was selected as one of the Laureate Global Fellows – an international fellowship for young social entrepreneurs. Melanie is also the first person in the world with a neuromuscular condition to complete The Duke of Edinburgh's International Award – she is the recipient of the Bronze, Silver and Gold Award. Following from the success of The Duke of Edinburgh's International Award, Melanie became a public speaker and spoke at many events including TEDxYouth@Sydney.

Twitter: https://twitter.com/Melanie__Tran
Facebook: https://www.facebook.com/melanietran2

Plenary: The Power of Self-generated Mobility: Providing Early Mobility Experiences for Infants & Toddlers

Assoc. Prof. Lisa Kenyon

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

1. Discuss 3 benefits of early power mobility use for infants and toddlers with mobility delays.
2. Develop a power mobility training plan to promote early mobility experiences for infants and toddlers with mobility delays.
3. List 3 outcome measures to assess power mobility training outcomes in infants and toddlers with mobility delays.

Session description:
The onset of independent, self-generated locomotor patterns (crawling, walking) radically changes a typically developing infant's relationship with the environment and leads to a cascade of developmental changes and opportunities. Infants and toddlers with delayed motor skills or mobility limitations; however, are unable to reap the inherent benefits of independent, self-generated locomotion and are at risk for secondary impairments in cognition, social skills, spatial awareness, and other developmental areas. Research suggests that providing these children with early mobility experiences provides benefits across the domains of the International Classification of Functioning Disability and Health and may prevent the onset of learned helplessness. Using video case examples from out program, this session will detail the theoretical background for providing early mobility experiences, present an overview clinical implementation of early mobility experiences using alternative power mobility devices such as modified battery-operated toy cars, and highlight the development of individualized mobility plans for young children with mobility delays and limitations.

Content references:

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2. Livingstone R, Paleg G. Practice considerations for the introduction and use of power mobility for children. Dev Med Child Neurol. 2014;56(3):210-221.
3. Kenyon LK, Hostnik L, PT, McElroy R, Peterson C, Farris JP. Power mobility training methods for children: a critical review. Pediatr Phys Ther. 2018;30(1):2–8.
4. Kenyon LK, Farris JP, Cain B, King E, VandenBerg A. Development and content validation of the Power Mobility Training Tool. Disabil Rehabil: Assist Technol. 2018;13(1):10-24.
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7. Kenyon LK, Farris JF, Gallagher C, Webster L, Hammond L, Aldrich A. Power mobility training for young children with multiple, severe impairments: a case series. Phys Occup Ther Pediatr. 2017;37(1):19-34.

Speaker biography:
Dr. Kenyon is an Associate 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 Committee of Content Experts for the Pediatric Specialty Council of the American Board of Physical Therapy Specialties

A1: Standing Up for Yourself: Activity & Participation Benefits of Standing Wheelchairs

Jenni Dabelstein, PT

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

1. Identify 3 key characteristics of wheelchair users who could potentially benefit from prescription of a standing wheelchair.
2. Identify 2 outcomes each in the ICF Activity and Participation domains that potentially reduce or minimise impairment and correspondingly build functional capacity for clients prescribed standing wheelchairs.
3. Identify 3 funding justification strategies to quantify the Activity and Participation benefits of standing wheelchairs to funding bodies.

Session description:
In clinical practice in Australia, it has become common over the past several years to have the option to incorporate standing function, either powered or manual, as part of wheelchair prescription. With the rollout of the NDIS, funding has become potentially available to support this feature for a large number of clients who have the capacity to both use and benefit from a standing option as part of their wheelchair. Historically, research into the benefits of standing have heavily focussed on body structure and function outcomes. However, contemporary clinical practice in Australia supports that a focus on this ICF domain and its corresponding health and well-being outcomes will often result in denial of funding: this is especially the case under the NDIS scheme, despite almost every participant having a documented health and wellbeing goal.

In my clinical practice I see a range of clients who will potentially benefit from standing wheelchairs. It is my frequent observation that the clients who most benefit from the combination of a standing and mobility device are often not those who would traditionally have had a stand-alone standing device prescribed or would adhere to a traditional standing program.

While health benefits of standing must be acknowledged, I find a focus on the ICF domains of Activity and Participation is the most effective way to evaluate and demonstrate the capacity-building benefits of a device that provides both mobility and standing in a single package. Most importantly, it is the dissection of the economic and social participation ramifications of Activity and Participation benefits that will often get the device funded. In this presentation I will provide examples from my own clinical caseload of clients who have benefited from standing wheelchairs, and how we have expressed Activity and Participation benefits to funding bodies, in order to get these devices paid for.

Content references:

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4. Scherer MJ, Glueckauf R. Assessing the benefits of assistive technologies for activities and participation. Rehabil Psychol. 2005;50(2):132–41. http://dx.doi.org/10.1037/0090-5550.50.2.132

A2: Participatory Design to Develop and Evaluate a Monitoring System for Power Tilt-in-space Wheelchairs

Claudine Auger, OT
Charles Campeau-Vallerand, OT
François Routhier, Eng
Philippe S. Archambault, OT
Dominic Létourneau, Eng
Dominique Gélinas-Bronsard, OT
François Michaud, Eng

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

1. Identify seven dimensions to be considered when evaluating a eHealth intervention
2. Describe similarities and differences in the views of users and therapists regarding the monitoring of tilt-in-space wheelchairs
3. Describe key functionalities that wheelchair monitoring systems should incorporate

Session description:
Power tilt-in-space wheelchairs meet many clinical purposes, including pressure relief/reduction/management, increased postural control and pain management. There is, however, a significant gap between the use of tilt as recommended by clinicians and its actual usage. A web-based eHealth intervention including a goal setting, monitoring, reminder and feedback system of the use of power tilt-in-space wheelchairs was developed. The intervention incorporates behavior change principles in order to promote optimal use of tilt and to improve clinical post-procurement follow-up. The objective of this study was to involve key stakeholders in the development and evaluation of the intervention prototype to integrate the point of views of end-users.

Methods: Based on a web-based eHealth intervention framework, semi-structured interviews were conducted with power wheelchair users and clinicians. A content analysis approach was used, with a mix of emerging and a priori concepts.

Results: Five users of power tilt-in-space wheelchairs, and five clinicians aged 23 to 55, were recruited. Participants found the web interface and the physical components easy to use. They also appreciated the reminder feature that encourages the use of the tilt-in-space, as well as the customization of performance goals. Participants requested improvements to the visual design and learnability of the web interface, the customization of reminders, feedback about specific tilt parameters, and the bidirectionality of the interaction between the user and the clinician. They thought the current version of the intervention prototype can promote optimal use of the tilt and improve clinical post-procurement follow-up.

Conclusions: Based on the needs identified by power wheelchair users and clinicians regarding the prototype of a power tilt-in-space wheelchair monitoring system, five main directions were defined for future development of the intervention. Further research with new power wheelchair users, manual tilt-in-space wheelchair users and family caregivers is needed to pursue the formative evaluation of the prototype.

Content references:

1. Baumel A, Faber K, Mathur N, Kane JM, Muench F. Enlight: a comprehensive quality and therapeutic potential evaluation tool for mobile and web-based eHealth interventions. J Med Internet Res 2017;19(3).
2. Gelinas-Bronsard D, Mortenson WB, Ahmed S, Guay C, Auger C. Co-construction of an Internet-based intervention for older assistive technology users and their family caregivers: stakeholders' perceptions. Disabil Rehabil Assist Technol 2018:1-10.
3. Mohr DC, Schueller SM, Montague E, Burns MN, Rashidi P. The behavioral intervention technology model: an integrated conceptual and technological framework for eHealth and mHealth interventions. J Med Internet Res 2014;16(6):e146.
4. Routhier F, Lettre J, Miller WC, Borisoff JF, Keetch K, Mitchell IM, CanWheel Research Team. Data logger technologies for powered wheelchairs: a scoping review. Assist Technol 2018;30(2):51-8.
5. Titus LC, Miller Polgar J. Reasons for using power tilt: perspectives from clients and therapists. Disabil Rehabil Assist Technol 2018;13(2):132-9.

A3: From Supine to Sitting: The seating journey of a Syrian Refugee

Kim Magnus, OT
Lynore McLean, PT

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

1. Discuss how different cultural views on disability impacts family acceptance/use and therefor therapist prescription of seating and mobility equipment
2. Apply knowledge from a case study to one's own clinical practice in relation to equipment prescription for refugee clients
3. State three benefits of implementing an interdisciplinary model of care for optimizing service to refugee families

Session description:
Between November 4, 2015 to January 29, 2017 Canada welcomed over 40,000 Syrian Refugees. This group included children and youth with developmental delay and cerebral palsy. Many of these families had extremely limited access to any services that supported growth, development, functional participation, and general health of their complex and even medically fragile children during a traumatic, long and arduous physical and emotional journey. With an international increase in numbers of refugees and migrants globally is a growing need to provide services for children and families who have had little or no care throughout their lives. Navigating a new health care system creates challenges including issues with communication, financial constraints, cultural differences and ongoing emotional tolls.
Our centre has adopted an interdisciplinary approach to meet the needs of this unique population. This approach attempts to ensure culturally appropriate care involving interpreters, settlement workers, social workers, government agencies, Developmental Pediatricians, Nurses, Occupational Therapists Physiotherapists, Dietitians and community partners such as school based teams and refugee service providers.
This presentation highlights the journey of a teenage boy and his family as they immigrated to Canada and how they navigated a new health care system. In addition to medical/orthopedic interventions, the impact of cultural, financial, and social factors will be discussed in how they relate to prescription and use of various seating and mobility equipment.

Content references:

1. Published 15 March 2018. https://doi.org/10.17061/phrp2811803 Citation: Pottie K, Gruner D, Magwood O. Canada's response to refugees at the primary health care level. Public Health Res Pract. 2018;28(1):e2811803.
2. Health status of Syrian refugees: https://www.cna-aiic.ca/~/media/cna/page-content/pdf-en/health-status-of-syrian-refugees.pdf?la=en
3. UN convention on rights of the child: https://www.ohchr.org/Documents/ProfessionalInterest/crc.pdf
4. Population profile: https://cpa.ca/docs/File/Cultural/EN%20Syrian%20Population%20Profile.pdf

A4: Travelling overseas with a child with a disability: The experiences of two Adelaide families

Julia Paterson

Learning objectives:

1. To educate attendees on the experiences of two families who have travelled to the UK and Europe with their child with a complex disability
2. To provide helpful hints and tips about travel
3. To outline assistive technology used during travel to enhance positioning and mobility

Session description:

For families with a child or adult with a complex disability, travel can be challenging. Even domestic travel can pose difficulties, from airline transport to appropriate accommodation. For families wishing to travel abroad, there are even more obstacles to overcome. Families can find it difficult to source reliable and up to date information during the planning phase, and often seek advice from their allied health team. The benefits of travel should be available to everyone, and the experience of travelling with the entire family is so important. Therefore, this case study presentation aims to share some valuable insight into the experiences of two Adelaide families who travelled overseas in 2018. Both families have a child/adolescent with a significant physical disability (GMFCS V), and both travelled to regions of the UK and Europe. Both children use a manual wheelchair with complex seating as their primary form of mobility.

Their experiences will highlight the factors which helped, or hindered their holiday. This includes aspects such as:

- Airline travel
- Insurance
- Assistive technology used during the holiday
- Accommodation
- Transportation
- Planning experiences (including the role of travel agents and other sources of information)
- Baggage
- Manual handling considerations

It is hoped that by sharing the experiences of these two families, attendees will gain a greater understanding of how travelling with a person with a disability can be made easier by implementing certain strategies. It is also hoped that this information might help inspire people with a disability, and their families, to consider overseas travel and experience all of the benefits that travel has to offer.

Content references:

1. Blichfeldt, BS & Nicolaisen 2011, “Disabled travel: not easy, but doable” Current issues in tourism, vol. 14, no. 1, pp. 79-102.
2. Kastenholz, E, Eusebio, C & Figueiredo, E 2015, “Contributions of tourism to social inclusion of persons with a disability”, Disability & Society, vol. 30, no. 8, pp. 1259-1281.
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4. Darcy, S, Cameron, B & Pegg, S 2010, “Accessible tourism and sustainability: a discussion and case study’, Journal of sustainable tourism, vol. 18, no. 4, pp. 515-537.

A5: Applying Clinical Outcome Measures to Mobility and Seating Assessments

Lois Brown, PT

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

1. Name at least two outcome measure for each manual and power chair prescription.
2. State at least three specific features/programming parameters for both manual and power wheelchair setup which can have an impact on the applied outcome measure.
3. Describe the application of these resources for documentation and funding for complex rehab equipment.

Session description:
Clinical evaluation, whether it be traditional therapy or wheelchair assessment, is no more than a case study of one. The wheelchair provision process varies widely from client choice without clinical input to a fully- scripted wheelchair with clinical advanced knowledge including clinical assessment, clinical reasoning, trials, client participation and feedback. Yet until recent years we have not implemented evidenced based clinical outcome evaluation tools to evaluate or justify those recommendations in clinical practice. An outcome assessment tool can help quantitatively and qualitatively assess the intervention. It can also be effective in the training, fit and adjustment of the device to decrease repetitive strain syndromes, energy conservation and establish safety in the use of the device. Documenting the results of an applied outcome measure can provide supportive justification to the prescribing body such as a funder to support the provision of the equipment. Specific outcome measures will be shared with references for clinical application of varying diagnoses.

Content references:

1. Davy, R. (2013). Exploring the application of the wheelchair outcome measure (WhOM) as an outcome measure for people with complex needs–a single case study.
2. Gagnon, D. H., Roy, A., Gabison, S., Duclos, C., Verrier, M. C., & Nadeau, S. (2016). Effects of Seated Postural Stability and Trunk and Upper Extremity Strength on Performance during Manual Wheelchair Propulsion Tests in Individuals with Spinal Cord Injury: An Exploratory Study. Rehabilitation Research and Practice, 2016.
3. Kahn, J. H., Tappan, R., Newman, C. P., Palma, P., Romney, W., Stultz, E. T. & Weisbach, C. L. (2016). Outcome Measure Recommendations from the Spinal Cord Injury EDGE Task Force. Physical therapy.
4. Scott A Conger, Stacy N Scott, David R Bassett, Jr. Predicting energy expenditure through hand rim propulsion power output in individuals who use wheelchairs, Br J Sports .Med 2014;48:13 1048-1053 Published Online First: 13 May 2014
5. Siobhan Kenny and Rosemary Joan Gowran Outcome Measures for Wheelchair and Seating Provision: A Critical AppraisalBritish Journal of Occupational Therapy February 2014 vol. 77 no. 2 67-77
6. Functional Tests for Persons who Self Propel a Manual Wheelchair, Rehabilitation Measures Database. Supporting text- http://www.scireproject.com/book/export/html/117 Initially reviewed by Christopher Newman, PT, MPT, NCS, Phyllis Palma, PT, DPT, and the SCI EDGE task force of the Neurology Section of the APTA in 9/2012

A6: A Biomechanical Approach to Managing Abnormal Postures of the Head and Neck

Kelly Waugh, PT

Learning objectives:

1. The participant will be able to list two important guidelines to follow when problem-solving regarding complex postural deviations in seating
2. The participant will be able to identify which direction the head will fall based on the location of the head's center of mass relative to the centers of rotation for cervical spine movement
3. The participant will be able to explain at least one way to manage or reduce a forward head posture in a wheelchair seating system.

Session description:

Abnormal postures and movements of the head and neck are one of the most challenging problems to address when working with clients with complex postural deviations in sitting. In this presentation, several common abnormal postures of the head and neck are analyzed using a biomechanical approach, including the forward head posture, persistent neck flexion, and lateral tilt of the head. Critical problem-solving guidelines are introduced first as a foundation for the specific focus on head and neck postures in the sagittal, frontal and transverse planes. Biomechanical principles are used both to analyze these postures and explore possible intervention strategies. Solutions are presented in the language of features, as opposed to product options.

Content references:

1. Banton, R. A., CMPT, A., & Bending, L. (2012). Biomechanics of the spine. *Journal of The Spinal Research Foundation FALL*, 7(2).
2. Edmondston, S. J., Sharp, M., Symes, A., Alhabib, N., & Allison, G. T. (2011). Changes in mechanical load and extensor muscle activity in the cervico-thoracic spine induced by sitting posture modification. *Ergonomics,* 54(2), 179-186.
3. Quek, J., Pua, Y. H., Clark, R. A., & Bryant, A. L. (2013). Effects of thoracic kyphosis and forward head posture on cervical range of motion in older adults. *Manual therapy*, 18(1), 65-71.
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5. Staarink, H. & Packwood, L (2011). *All there is to know about sitting: sitting behavior, seats and wheelchairs*. Netherlands: Royal Van Gorcum, p.45, fig 2-26: Position of the centre of mass: M in relation to the pivot point: S
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 (363 pgs). Available from: www.assistivetechnologypartners.org

A7: Virtual Reality, Augmented Reality and Wheelchairs – what is the potential?

Rachael McDonald, BAppSc(OT), PhD, PGCE, PGDip(Biomech)

Learning objectives:

1. To describe virtual, augmented and mixed reality, identify their differences and potential in wheeled mobility and seating
2. Discuss some current work being undertaken in development of virtual reality and describe the potential, challenges and limitations of the work
3. Apply #1 and #2 in order to prioritise future developments.

Session description:

The aim of this 30-minute workshop is to provide up to date information and evidence on virtual, augmented and mixed reality in the world of wheelchairs. Although virtual reality has existed for decades, until the mid-2000s it was largely confined to video game arcades, industrial projects, flight simulation and military training. With the advent of mobile technologies, and portable/wireless technologies, 'Reality' technology has become more accessible; and developers themselves more skilled and more commonly accessible. This workshop will walk participants through different aspects of reality based technologies, including evaluation of the different components, then describe where this has been applied in wheeled mobility and seating.
The workshop will finish with a discussion on priorities for the future; using both hard and soft technologies.

A8: Connected Care: Sensor-based assistive technology to transform the way wheelchair users manage their health

Kath Hamilton

Learning objectives:
Upon completion of the session, participants will have an understanding of:

1. How new advancements in digital healthcare will improve the self-efficacy of wheelchair users with the support of their care team
2. The exciting opportunity of combining qualitative data logged by the user, with quantitative data from the sensor pad, to understand the user's body and activities and manage individual health risks associated with immobility
3. How nurses, clinicians and therapists can access objective and continuous diagnostic information to gain insights and customise care plans for patients everyday lives

Session description:
The health consequences of living in a wheelchair are recurrent pressure sores, pneumonia, scoliosis and UTI's. This is a huge impact to our health system with $2billion spent on wound care each year alone.

Many wheelchair users have little to no understanding of what is happening with their body in the wheelchair throughout the day. With the loop+ platform, now there is a way to track, visualise and share data with wheelchair users to manage their own health risks. Loop+ supports the care processes in place at hospitals, private clinics and regional health centres to identify risks early and take action.

Our innovative technology incorporates a sensor pad, which continuously collects data on user activity. This data is synthesised and presented to wheelchair users and their care team in an easy to use mobile and web applications. "Just like a fitbit for your bum really."

Our platform learns from each user and the network of all loop+ users to both predict injury risk and enable effective recommendations. The user interface includes alerts, goal setting and educational content to support and motivate the user to manage their health with the support of their care team.

With the loop+ dashboard nurses and clinicians can access real-time information pressure, position, movement and activity to gain insights and customise care plans for patients everyday lives. They can now have data driven conversations and reviews based on historical data, which has been captured by the sensors and logged by the patient. This will revolutionise the current laborious and subjective practices that are performed by health professionals today, allowing for precise and effective treatment of issues.

loop+ aims to standardise care and increase the access, efficacy and efficiency of care with continuous tracking for health visibility. loop+ encourages patient involvement in their own treatment and ongoing care plans, increasing confidence and compliance to improve patient outcomes and quality of life.
https://www.loopplus.com.au/

Content references:

1. Barney Smith - General Manager icare Foundation
   Loop+ has partnered with icare Foundation to develop our platform for icare participants. Icare have provided loop+ with a grant of $500,000 to develop the product and trial with participants. The investment is part of the icare foundation's commitment to funding initiatives that prevent injuries, empower people to recover from injury and help them return to their communities sooner.
   "Supporting this platform is important, as more than 85 per cent of wheelchair users would develop a pressure injury in their lifetime." Barney Smith, icare
   https://www.icare.nsw.gov.au/news-and-stories/new-app-improves-health-outcomes-for-wheelchair-users/
2. Warren Bingham - MedLab general manager
   Loop+ has just completed a four-month accelerator program Medlab (Cicada Innovations) alongside five early-stage medical tech startups.
   The standard of the participants reflects "the depth of talent in medical research and innovation here in Australia" Cicada MedLab

general manager Warren Bingham
Participating in the Medlab accelerator over the past four months loop+ has stress-tested their product with mentors to commercialise the business idea to take to market in September 2019.
https://www.smartcompany.com.au/startupsmart/news/cicada-medlab-accelerator-graduates/

3. Pete Horsley - Remarkable Tech Accelerator
   Loop+ was one of the six startups that went through the Remarkable Disability Tech accelerator as Cohort #3 in 2018
   "People with disability are severely under-represented in reaping the benefits of digital technologies as both producers and consumers."
   Loop+ is both a producer and consumer of their own technology. With both the founder (as a mother/carer) and other key staff appointments being wheelchair users, they have a true understanding of the product they are developing.
   https://remarkable.org.au/startups/

B1: Identification of postural abnormality in young adults with cerebral palsy

Carlee Holmes, PT
E Fredrickson
K Brock
P Morgan

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

1. Identify typical patterns of body shape distortion in non-ambulant populations with complex disability
2. Understand the use of the Goldsmith Indices of Body Symmetry in measurement to aid in 24-hour postural management
3. Describe the benefits and limitations of the Goldsmith Indices of Body Symmetry, including reliability of measurement

Session description:
Background and Objective(s): Non-ambulant adults (Gross Motor Function Classification System, GMFCS, Level IV or V) with cerebral palsy (CP) are particularly vulnerable to spinal, pelvic and hip postural asymmetry arising from neuromuscular dysfunction. A common postural problem is characterised by abduction and external rotation of one lower limb and adduction and internal rotation of the opposite lower limb, known as 'windsweeping'. Regular radiographs to monitor skeletal changes in this population are challenging to implement due to cognition and / or an inability to achieve a standardised supine position. The Goldsmith Indices of Body Symmetry (GIofBS) is a simple clinical measurement tool to facilitate postural assessment and monitoring. This study aimed to explore the intra and inter rater reliability of the GIofBS in adults with CP (GMFCS IV and V).

Study Design: Psychometric evaluation of a clinical measurement tool

Study Participants & Setting: 30 adults with CP (GMFCS IV and V), mean age 21 years, (range 17–38), attending an outpatient tertiary clinic

Materials/Methods: Participants underwent measurement of spinal and pelvic/hip alignment using the GIofBS by two trained raters on a single occasion. A Windsweeping Index (hip and pelvic symmetry), chest right/left ratio (thoracic symmetry), a chest depth/width ratio (thoracic shape) and hip external rotation / abduction were calculated. Intra and inter rater reliability was established. .

Results: The Windsweeping Index was mean (sd) 19.02 (22.74), range 0.75 to 81. Intra class correlation coefficients for intra rater reliability (four consecutive measurements by each rater) were ≥ 0.97, and ≥ 0.85 for inter rater reliability for all GIofBS scores. Paired samples t-test indicated no significant difference between raters ($p > 0.05$).

Conclusions/Significance: The GIofBS measurement procedure is well tolerated by adults with significant physical disability. The GIofBS is a reliable measurement tool to measure and monitor postural asymmetry in this population.

Content references:

1. Goldsmith, E., Golding, R. M., Garstang, R. A., & MacRae, A. W. (1992). A Technique to Measure Windswept Deformity. Physiotherapy, 78(4), 235-242. doi:https://doi.org/10.1016/S0031-9406(10)61432-0
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3. Holmes, C., Brock, K., & Morgan, P. (2018). Postural asymmetry in non-ambulant adults with cerebral palsy: a scoping review. Disability and Rehabilitation, 1-10. doi:10.1080/09638288.2017.1422037
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7. Palisano R. Gross motor function classification system for cerebral palsy. Developmental Medicine and Child Neurology. 1997;39:214-23.

B2: Do older adults need wheelchair propulsion training? A single-subject research design

Megan K MacGillivray
Janice J, Eng
Elizabeth Dean
Bonita J Sawatzky

Learning objectives:

1. Understand the value of single-subject research design studies for older adult wheelchair users.
2. Understand the impact of wheelchair propulsion training in two diverse candidates for wheelchair propulsion.
3. Identify limitations in our single subject research design study.

Session description:
The objective of this study was to examine biomechanical and metabolic effects of motor skill-based wheelchair propulsion training compared with uninstructed practice in older adults.

Two older adults (61-year-old female, 59-year-old male) with mobility disabilities volunteered to participate in this study. Both participants used assistive walking devices for their mobility, but neither used a manual wheelchair. Participants used a fitted lightweight laboratory wheelchair with a force sensing pushrim attached on their dominant side. Participant 1 had severe scoliosis and bilateral muscle weakness in her legs whereas participant 2 was quadriplegic and had asymmetrical muscle strength and range of motion in his arms. An A-B model single subject research design (SSRD) was used. Phase A included six uninstructed practice sessions and Phase B included six training sessions. Each session involved two 5-minute blocks of wheeling, separated by a 5-minute rest break, delivered at a frequency of 2-3 sessions/week. Biomechanical data (kinetic, kinematic, and temporal-spatial) were collected during each session. The two-standard deviation band method was used to analyze biomechanical data. Metabolic and transfer data were collected on day 1 (baseline), day 6 (final day of Phase A), and day 12 (final day of Phase B), to identify potential trends. An exit questionnaire was completed after the final testing session.

Compared with baseline, participants increased their push angle and decreased their push frequency and peak negative force. Furthermore, participants reported that they had improved their wheelchair propulsion.

Given the heterogeneity of older adult wheelchair users, SSRD studies provide valuable insight into the efficacy of wheelchair propulsion training. Training should be individualized to accommodate asymmetries and individual needs related to wheelchair propulsion. Future research should consider wheelchair propulsion recommendations and goals based on each individual's health status and physical ability.

Content references:

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B3: Effectiveness of a School-Based Wheelchair Skills Training Program for Youth

Paula W Rushton, OT
Genevieve Daoust, OT
Maude Michaud, OT

Learning objectives:

1. Participants will be able to describe the physical education course described in this presentation that aims to maximize independence in wheelchair use through wheelchair skills training and other activities and its effectiveness.
2. Participants will be able to describe at least 2 outcome measures that may be used to evaluate the effectiveness of wheelchair skills training in a school setting.
3. Participants will be able to describe how this type of wheelchair skills training may, or may not, be useful in their settings.

Session description:

Introduction. Wheelchair skills training is not typically provided when a child receives a wheelchair, which may have consequences for independence and safety.[1] Providing this training at school has the potential to enhance wheelchair use, but has yet to be evaluated. **Objectives.** This project had three objectives: (1) to test the hypothesis that wheelchair skills of youth participating in a school-based program will significantly improve post-program, (2) to explore changes in wheelchair skill mid-intervention to post-intervention, and (3) to test hypotheses between wheelchair skills and other relevant outcomes. **Methods.** Design: A pre-post design was used. Participants: Eleven youth wheelchair users, with varying diagnoses and experience, participated in this study. Intervention: The intervention consisted of a physical education course offered in a specialized school that had the aim to maximize independence in wheelchair use through wheelchair skills training and other activities. This course was led by an occupational therapist, a physical therapist and a physical education teacher over a 10-month period, 90 minutes / week. Outcome Measures: Wheelchair skills, wheelchair propulsion and endurance were measured using the Wheelchair Skills Test,[2] Wheelchair Propulsion Test[3] and the 12 Minute Propulsion Test respectively. Data Collection: All measures were administered pre (T1) and post (T3) intervention. Additionally, the WST was administered mid-intervention (T2). Results: The mean (SD) values for wheelchair skills at T1, T2 and T3 were 59.5(8.0), 65.6(9.1) and 65.7(8.5). Wheelchair skills scores improved significantly between T1 and T3 (p = 0.008), but not between T2 and T3 (p = 0.981). Wheelchair skills correlated significantly with wheelchair propulsion (r = 0.74, p = 0.02), but not endurance. **Conclusions**: This study provides evidence of the effectiveness of a school-based wheelchair skills training program, however, that improvements were not seen between mid- and post-intervention provides evidence that there is room for improvement in delivery of this course.

Content references:

1. Best KL, Routhier F, Miller WC. A description of manual wheelchair skills training: current practices in Canadian rehabilitation centers. Disabil Rehabil Assist Technol 2015; 10: 393-400.
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B4: Peer-led approaches for improving satisfaction with participation, wheelchair skills and self-efficacy among children who use manual and power wheelchairs.

Krista Best, PhD
Debbie Wilson, OT
William C. Miller, PhD, FCAOT

Learning objectives:

1. Describe the influence of peer-led wheelchair training groups on satisfaction with participation and wheelchair skills among youth.
2. Explain how a peer-led wheelchair training groups influences parents' perception of their child's capacity for wheelchair skills.
3. Identify 3 outcome measures that will assist in the evaluation of the effectiveness of wheelchair skills training.

Session description:

Rationale: Peer-led approaches improve manual wheelchair skills, wheelchair use self-efficacy and satisfaction with participation among adults.1,2 Using existing scientific evidence,3,4 clinicians from Seating To Go (STG) developed a community-based peer-led wheelchair training program for children. Given that there is limited evidence about the influence of peer-led wheelchair training among children, an international partnership was cultivated between researchers in Canada and clinicians in New Zealand to evaluate the STG program. The objectives of this study are to evaluate the influence of the STG program on: 1. Satisfaction with participation (primary outcome), wheelchair skills, and wheelchair use self-efficacy.; and 2. Evaluate parents' perceived wheelchair skills capacity of their child.

Method: A four-site (Hamilton, Rotorua, Tauranga, Auckland) pre-post design will be conducted with 40 children (ages 4-17 years) who use either manual or power wheelchairs. In groups of approximately 10, children will complete the STG peer-led wheelchair training program (ie. 2 x 2-hour sessions facilitated by adult wheelchair users). Children will complete evaluations for satisfaction with participation (Wheelchair Outcome Measure), objective wheelchair skills (Wheelchair Skills Test), and wheelchair use self-efficacy (WheelCon) before and after the STG program. Parents will also complete a pre-post subjective evaluation of their child's wheelchair skills capacity (Wheelchair Skills Test Questionnaire). Within-subject analysis will be performed.

Results: Preliminary results will be presented.

Conclusion: As observed among adults, it is hypothesized that peer-led wheelchair training administered to children in the community will lead to similar improvements in satisfaction with participation, wheelchair skills and self-efficacy. This will be the first study to document the influence of peer-lead training among individuals who use power mobility devices.

Content references:

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4. 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. 2018. doi:10.1080/17483107.2018.1456566

B5: Wheelchair Prescription and Clinical Decision Making for a Client with a Functional Neurological Disorder

Monique Lamerand, OT

Learning objectives:

1. Participants will be able to state at least two key factors in supporting a client's seating goals despite the client's presenting diagnosis.
2. Participants will state at least five key assessment questions while taking a clear history of how the client will be using their chair and what their postural needs are, despite the inconsistencies in their client's symptoms.
3. Participants will be able to state at least two funding goals and justification when submitting their costings to the NDIS as they understand that their clients are not 'faking their issues' or 'malingering'.

Session description:

Clients with functional neurological disorders are complex and if not supported wisely by the treating team, leave the client feeling judged and misunderstood. The role of the occupational therapist and physiotherapist is to listen and treat the client with respect and with a 'client-centred' approach. The presenting symptoms are real and yet clinicians may perceive the presenting symptoms are under the client's volitional control. A clinical dilemma occurs when the OT or PT do not accommodate the client's functional presentation due to bias and misunderstanding about this condition. Tension may occur with spending government funds to pay for a manual or power wheelchair that may or may not be needed long term: tension may also occur when the clinical presentation is at odds with a potential diagnosis, other than a "functional neurological disorder". The OT and PT must prescribe the wheelchair without judgement and put the client's needs first. This course will use a single-subject design to highlight the clinical assessment process in complex rehab assessment.

Summary: Clients with a functional neurological disorder often feel that their allied heath team or neurologist believe their symptoms are "all in the mind". As a consequence, these clients may find themselves at odds with their clinicians during their rehabilitation and during the prescription of their wheelchairs.

The clinicians must remember that their client have no diagnosable issues with their "brain hardware" but complex issues with the "neuronal software"! As a result of this complex diagnosis the clinicians must adopt a client-centred approach and identify their client's physical and functional needs with regards to their wheelchair prescription; it is only in creating a relationship where the clinician listens actively to their clients, and respectfully completes a functional review of their presenting needs, that an appropriate chair will be scripted.

These clients are as entitled to their power or manual chairs as those whose MRI scans show an organic pathology. Clinicians must understand their client's diagnosis, and not be tempted to prescribe a chair based on a diagnosis of organic pathology. For example, a client who presents with "MS-like" symptoms, without a positive MRI diagnosis, may have a neurologist diagnose them with a "functional neurological disorder". The wheelchair script must address the presenting physical and cognitive issues, and the wheelchair must accommodate the client's issues of fatigue, overuse syndrome of the upper limbs, and the client's postural deficits. The diagnosis of MS is not relevant: the clinical presentation is the focus.

Private or public funding must be available for participants with these complex disorders, and the prescribing therapists are responsible for being empathic, understanding and highly skilled in accommodating their client's needs. A multidisciplinary approach is recommended, and the wheelchairs must be prescribed and later modified according to the client's functional presentation.

Content references:

1. David, A, (May, 2015) Paralympics and conversion disorder. Journal of Neurology, Neurosurgery & Psychiatry Vol 87 Issue 2
2. Minkel, J. (2018) Seating and mobility evaluations for persons with long term disabilities: Focusing on the client assessment.

In M.L. Lange & J. Minkel (Eds.), Seating and wheeled mobility: A clinical resource guide (pp. 85-120). Thorofare, NJ: Slack Incorporated.
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B6: A successful story of innovation through partnership: Product design meets real client needs

Joana Santiago
Laura Fleming
Luke Holmes

Learning objectives:

1. Refer two possible consequences, on a long-term seating posture, if asymmetric limited hip flexion is not appropriately accommodated with primary seating surfaces.
2. List three possible outcomes observed when a product is designed and developed based on a client centered approach
3. Identify four distinct stakeholders who may be involved in a multi-disciplinary collaborative approach to facilitate development of the field of seating and wheeled mobility

Session description:

Without people in mind, design is blind (Gwynn, K.). The motto is not ours, but it could well be!
In any field, product design must be linked to a need, that has been clearly identified in the market. This becomes even more crucial when that need comes from clients who, due to their challenging postural requirements, have a limited choice of products to choose from.

How can we support a client with significant unilateral hip flexion limitation and non-reducible pelvic obliquity when the client's support network does not wish to pursue a custom / bespoke solution and the off-the-shelf solutions offering are very limited? Furthermore, how do we create an off-the-shelf solution which can be customised to provide a tailored solution for other clients with similar needs?

This interactive workshop showcases an in-depth case study of a client whose clinical needs were not being met by off-the-shelf products; from the physical evaluation of the client, to determining the product requirements and the design development stages. We will guide participants through the clinical reasoning and the product design thinking used on this successful journey which involved an active collaboration between the client, his support network, his main therapist, a local product supplier and several people from a manufacturer side. The outcome of this multi-disciplinary collaborative approach led to the development of an innovate solution which not only met our original client's needs and goals but also other clients with similar needs. This project was further extended to other clients and clinicians in Australia and in New Zealand to assist with the clinical evaluation of the product.

Current evidence-based recommendations, product design process and client centred principles will be discussed.

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2. Interdisciplinary Conference on Posture and Wheeled Mobility (2014). International Bes Practice Guidelines. BPG2: Clinical guidelines for the use of interface pressure mapping for seating.
3. Johnston, P., Currie, L.M., Drynan, D., Stainton, T. & Jongbloed, L. (2014). Getting it "right": how collaborative relationships between people with disabilities and professionals can lead to the acquisition of needed assistive technology. Disability and Rehabilitation: Assistive Technology, 9:5, 421-431. DOI: 10.3109/17483107.2014.900574
4. Martin, J.K. Martin, L.G. Stumbo, N.J. & Morrill, J.H. (2011). The impact of consumer involvement on satisfaction with and use of assistive technology. Disability and Rehabilitation: Assistive technology, 6(3):225-42. DOI: 10.3109/17483107.2010.522685.
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B7: The Foundations of Wheelchair & Seating: A practical solution to assessment and outcomes

Meredith Miller, OT
Alisha Parkin, OT

Learning objectives:
Participants will:

1. Understand the biomechanics of seating with particular reference to pelvic stability and function
2. Be able to identify client's wheelchair seating needs through clinical evaluation
3. Be able to identify potential indicators for complex wheelchair and seating assessment.

Session description:
Wheelchair and seating prescription is essential for creating a stable and functional base of support for our clients. We have the potential to impact tone, asymmetry, abnormal movement patterns, orthopaedic deformity/muscle shortening, pressure redistribution and more. We will discuss the problems associated with pelvic instability, including posterior/anterior pelvic tilt, rotation and obliquity and the implications of these positions.

The workshop will be presented in two parts. The first part will be a PowerPoint presentation. It will give participants the basis for understanding the biomechanics of wheelchair and seating, and an understanding of the purpose and outcomes of a physical evaluation in supine and sitting. The second component of the workshop will be practical. Facilitators will demonstrate how to complete a physical evaluation. Participants will carry out mat evaluations in peer groups with support and direction from the facilitators with an opportunity to ask questions and refine their technique.

The practical session will utilise the assessment form for people with non-complex needs that forms part of the New Zealand Ministry of Health's Level 1 Wheeled Mobility and Postural Management credential. This assessment format includes indicators for input from a more experienced assessor.

Content references:

1. ISO 16840 (2006): Wheelchair Seating – Part 1 Vocabulary, reference axis convention & measures for body segments, posture & postural support surfaces.
2. A Clinical Application Guide to Standardised Wheelchair Seating measures of the Body & Seating Support Surfaces. Revised edition July 2013
3. National Pressure Ulcer Advisory Panel (NPUAP), European Pressure Ulcer Advisory Panel (EPUAP). Prevention & Treatment of Pressure Ulcers: Clinical Practice Guideline. 2009 www.npuap.org
4. Pan Pacific Clinical Practice Guideline for the Prevention & Management of Pressure Injury. 2012. www.nzwcs.org.nz
5. Mayson T. Surveillance & Management of Hip Displacement & Dislocation in Children with Neuromotor Disorders Including Cerebral Palsy. (2011) www.childdevelopment.ca
6. Pope, P (2007). Severe and Complex Neurological Disability – Management of the Physical Condition. Butterworth, Heinmann
7. Lange, ML & Minkel, JL (2018). Seating and Wheeled Mobility: A Clinical Resource Guide

C1: Maximizing Propulsion Efficiency

Jane Fontein, OT

Learning objectives:

1. Understand the importance of propulsion efficiency as it relates to UE health
2. Identify differences in efficiency between wheelchair frame types
3. Learn the key points of wheelchair configuration that impact propulsion

Session description:

When you consider the energy required to propel every day in a manual wheelchair, and the forces that impact the upper extremity, it is necessary to consider the importance of propulsion efficiency. A wheelchair user who can propel efficiently will be able to push farther, have more energy, and function throughout the day. But, how can clinicians help improve efficiency?

There are a variety of factors that clinicians can impact to assist the user. It starts with wheelchair frame selection and wheelchair configuration. But, it doesn't stop there. The clinician should also be prepared to assess propulsion technique and provide instruction on the method that is most likely to protect the upper extremities and allow the user to easily traverse his/her environment. A comprehensive plan should be made to assess efficiency when a manual wheelchair is delivered.

This presentation will review important upper extremity research, discuss the importance of propulsion technique and wheelchair configuration, and discuss how the construction and design of the wheelchair frame can contribute to better efficiency. The goal is to maximize function and help clients maintain quality of life.

Content references:

1. Cowan RE, Nash MS, Collinger JL, Koontz AM & Bonninger ML (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.
2. Brubaker CE. Wheelchair prescription: an analysis of factors that affect mobility and performance. J Rehabil ResDev. 1986;23(4):19–26.
3. Beekman CE, Miller-Porter L, Schoneberger M. Energy cost of propulsion in standard and ultralight wheelchairs in people with spinal cord injuries. Phys Ther. 1999;79(2):146–58.
4. Rehabilitation Engineering & Assistive Technology Society of North America (RESNA). 2012. Position on the Application of Ultralight Manual Wheelchairs [position paper]. Retrieved from: RESNA: www.resna.org/resources/position_papers.dot. (2011). Position on the Application of Ultralight Manual Wheelchairs [position paper].
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6. Boninger ML, Koontz AM, Sisto SA, Dyson-Hudson TA, Chang M, Price R et al. Pushrim biomechanics and injury prevention in spinal cord injury: Recommendations based on CULP-SCI investigations. J Rehabil Res Dev 2005;42(3 Suppl 1):9-20.
7. Requejo P, Mulroy, Haubert, et al. Evidence-Based Strategies to Preserve Shoulder Function in Manual Wheelchair Users with Spinal Cord Injury.Top Spinal Cord Injury Rehabilitation. 2008; 13(4): 86-119.
8. Freixes O, Fernandez SA Gatti MA., Crespo, MJ, Olmos LE & Rubel IF (2010). Wheelchair axle position effect on start-up propulsion performance of persons with tetraplegia. Journal of Rehabilitation Research & Development, 47(7): 661-668.

C2: Moving Forward together: A Framework for Alternative Drive Control Evaluation

Rachel Fabiniak, PT

Learning objectives:

1. Compare two functions of proportional versus non-proportional drive controls as they relate to client performance.
2. Contrast at least three types of power wheelchair input devices and mounting options in respect to their ability to be adapted following a medical status change.
3. Apply information gathered through observation and evaluation of client factors to select an appropriate power wheelchair drive control.

Session description:
Clients aging with a disability and clients with progressive neuromuscular conditions face increasing challenges maintaining independence with mobility and mobility-related ADLs. Clients aging with a disability encounter changes in their health conditions earlier and more frequently than would otherwise be observed, while progressive neuromuscular conditions vary in their onset, duration, and prognosis. Technology must also advance at a pace that can match the functional needs of the person. For individuals with limited use of their bodies or with progressive neuromuscular conditions, alternative drive controls can open the door for independent mobility and environmental control.

This session will help clinicians to identify and anticipate clinical changes that their clients may experience, as well as to determine the most appropriate recommendations for CRT to meet these changing needs-both at initial assessment and over time. Evidence about changing clinical needs will be discussed, along with several clinical examples, to demonstrate mobility solutions for users of varying functional abilities. The difference between proportional and non-proportional drive controls and description of client factors that impact drive control selection will be discussed. This presentation will also take a brief look into the programming considerations and its impact on maintaining proportion drive controls. Special consideration will be given to flexible systems that easily adapt to meet the user's needs following a decline in medical status or loss of functional mobility.

At the end of this presentation clinicians and providers will have developed a framework to aide in observation, evaluation, and selection of an appropriate input device along with programming parameters for functional power wheelchair mobility.

Content references:

1. Rolfe, J. (2012). Planning wheelchair service provision in motor neuron disease: implications for service delivery and commissioning.British Journal of Occupational Therapy,75, 217-222.
2. Thorp, E. B., Abdollahi, F., Chen, D., Farshchiansadegh, A., Lee, M. H., Pedersen, J. P., ... &Mussa-Ivaldi, F. A. (2016). Upper body-based power wheelchair control interface for individuals with tetraplegia.IEEE Transactions on Neural Systems and Rehabilitation Engineering,24(2),249-260.
3. Wästlund, E., Sponseller, K., Pettersson, O., & Bared, A. (2015). Evaluating gaze-driven power wheelchair with navigation support for persons with disabilities.Journal of Rehabilitation Research &Development,52(7).

C3: Mobile Shower Commodes for users with spinal cord injury: an introduction to assessment and specification

Emma Friesen

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

1. Describe the five elements of the PHAATE model of Assistive Technology design and assessment, and give three examples of each element relevant to MSCs.
2. Explain the nine major activities associated with using mobile shower commodes, and at least ten major MSC features that impact these activities.
3. Describe three validated outcomes measurement instruments that can be used to assess MSC usability; and
4. Describe four stages in MSC service delivery where validated outcomes measurement instruments can be used to assess MSC usability.

Session description:
This workshop is aimed at occupational therapists, nurses, assistive technology practitioners, and other stakeholders tasked with assessing, specifying, justifying, or approving mobile shower commodes (MSCs) for individual users.

In this 60 minute workshop, participants will be introduced to a user-centred and evidence-based approach to assessing and specifying MSC frames and seating.

The workshop will begin with a review of research on mobile shower commode design and assessment, and explore the concept of usability as it relates to MSCs for adult with SCI. Major findings of the presenter's research into MSC usability will be discussed, along with implications for clinical practice in spinal cord injury and neurogenic bowel dysfunction. Participants will be introduced to the Policy, Human, Activity, Assistance and (assistive) Technology, and Environment (PHAATE) model of AT design and assessment, and learn the importance of assessing usability-for-one (U41) for individualised MSC specifications. Three outcomes measurement instruments that have been validated for assess MSC usability will then be reviewed. Participants will discuss how these instruments can be used to capture and document end-user experiences during four stages of MSC service delivery: evaluation of MSC usability during initial assessments, comparing and differentiating between different specifications during MSC usability trials, as a means to generate evidence for reimbursement and funding, and during follow-up on MSC usability after short- or long-term use. Finally, participants will discuss strategies and steps for incorporating these outcomes measurement instruments into existing service delivery processes.

Content references:

1. Cooper, R. A. (2007). Introduction. In R. A. Cooper, H. Ohnabe, & D. A. Hobson (Eds.), An introduction to Rehabilitation Engineering (pp. 1-18). Boca Raton, FL: Taylor & Francis.
2. Friesen, E. L., Theodoros, D., & Russell, T. (2013). Clinical assessment, design and performance testing of mobile shower commodes for adults with spinal cord injury: an exploratory review. *Disability and Rehabilitation: Assistive Technology*, 8(4), 267-274. doi:10.3109/17483107.2012.704656
3. Friesen, E. L., Theodoros, D., & Russell, T. G. (2015). Use, performance and features of mobile shower commodes: perspectives of adults with spinal cord injury and expert clinicians. *Disability and Rehabilitation: Assistive Technology,* 10(1), 38-45. doi:10.3109/17483107.2013.832413
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C4: What Large Data is Showing about the Impact of Mobility Assistive Equipment and Services

Mark Schmeler, OT
Richard M. Schein
Vince Schiappa
Andi Saptono
Gede Pramana

Learning objectives:

1. Describe three benefits of utilizing a registry
2. Identify three core domains and variables of the FMA/UDS Outcomes Registry
3. Describe three analyses and findings of the FMA/UDS Outcomes Registry

Session description:

Clinical investigators at the University of Pittsburgh in collaboration with the nationwide network of wheelchair seating & mobility providers have developed The Functional Mobility Assessment & Uniform Data Set (FMA/UDS) Outcomes Registry. During the last three years, over 2000 cases have been logged into the registry. Preliminary analyses of the registry data have been presented. The sample size has now grown to the point where discrete analyses can be performed, presented, and published. This session will present updated developments of the registry including user demographics, types of mobility devices and accessories used by different populations, and service delivery models. Several discrete analyses will be shared including; the impact of best practice and properly fitted equipment on functional outcomes, community participation, and the reduction of secondary health issues such as falls, pressure sores, and hospital readmissions. Additional iterations of the registry will be addressed such as a Family Centered version, Orthotics and Prosthetics version, and Spanish translation. Additionally, strategies for the implementation of standardized measures into the clinical routine and associated data collection, aggregation, and analyses will be discussed.

Content references:

1. Cohen, L., Greer, N., Berliner, E., & Sprigle, S. (2013). Mobility RERC State of the Science Conference: considerations for developing an evidence base for wheeled mobility and seating service delivery, Disability and Rehabilitation: Assistive Technology, 8(6). 462-471.
2. Gliklich, R., Leavy, M., Karl, J., Campion, D., Levy, D., & Berliner, E. (2014). A framework for creating standardized outcome measures for patient registries. Journal of comparative effectiveness research. 3(5). 473-480.
3. Kumar, A., Schmeler, M.R., Karmarkar, A.M., Collins, D.M., Cooper, R., Cooper, R.A., . & Holm, M.B. (2013). Test-retest reliability of the Functional Mobility Assessment (FMA): A pilot study. Disability and Rehabilitation Assistive Technology. 8(3). 213-219.
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C5: When Disability Becomes a Force of Innovation: Designing for Social Change

Melanie Tran

Learning objectives:

1. Participants will gain high level insights into the principles of design thinking.
2. Participants will gain practical tips on how to leverage the power of design and technology to improve workflow and service delivery within allied health and the disability sector.
3. Participants will solve a design challenge using the design process and reflect on how this process can be applied to their everyday work.

Session description:

Technology is evolving rapidly, and while technology is changing, so is our behaviour and attitude. Technology has the power to change the way we behave and the way we choose to do things, but is that enough to drive change in the way we deliver allied health services to clients who need it most? Technology itself won't be enough to get us there – when the principles of design meets technology, that's when the magic can happen.

Design goes far beyond functionality and aesthetics – it is about empathy and putting the end users at the heart of every decision, in every step of the way when we design, develop and deliver any solution. When we combine these principles of design with technology, we learn to truly embrace accessibility at the core – whether it's working with clients and their families to achieve a goal, looking at ways to deliver services effectively and efficiently, or using the challenges we face as a force of innovation.

This session will help participants understand the power of design and provide practical tips on how these principles can be applied to their everyday work. The 60 minute taster session will allow participants to get a glimpse of the design thinking methodology and solve a design challenge using the design process.

Content references:

1. IDEO Design Thinking: Creative Problem Solving https://www.ideou.com/pages/design-thinking
2. Lean UX Canvas https://jeffgothelf.com/blog/leanuxcanvas/
3. Leveraging the Power of Design and Design Thinking for Public Health https://www.rwjf.org/en/blog/2013/10/leveraging_the_power.html
4. The State of the Art of Design in Health: An expert-led review of the extent of the art of design theory and practice in health and social care https://www.researchgate.net/publication/281443863_The_State_of_the_Art_of_Design_in_Health_An_expert-led_review_of_the_extent_of_the_art_of_design_theory_and_practice_in_health_and_social_care

C6: Enhancing Education of Wheelchair Service Providers: An Overview of Current Initiatives

Paula W Rushton, OT
Mary Goldberg
Jon Pearlman

Learning objectives:

1. Participants will be able to describe the current state of wheelchair service provision education globally.
2. Participants will be able to describe at least 2 resources that may be used to enhance wheelchair service provision education.
3. Participations will be able to describe how at least 1 resource may be incorporated into their context for either providing or receiving education.

Session description:

The shortage of competent wheelchair service providers is increasingly being accepted as an important contributor to the issue of inappropriate wheelchair provision. The need to build a competent workforce was highlighted in the World Health Organization's Global Cooperation on Assistive Technology[1] and the Global Priority Research Agenda,[2] the 2017 Global Research, Innovation and Education on Assistive Technology Summit[3] and the 2018 Wheelchair Stakeholders' Meeting.[4] This workshop will describe initiatives by the International Society of Wheelchair Professionals (ISWP)[5] that aim to advance knowledge regarding current wheelchair service provision education,[6] including associated barriers and facilitators,[7] and advance the education itself. Presenters will provide a synthesis of data collected from an international wheelchair education survey,[5] qualitative interviews with representatives from health care professional university programs[6] and academic training partners that will provide insights into the current wheelchair service provision education being offered globally. Current initiatives designed to facilitate and enhance education in this domain will then be described, including a *Wheelchair International Network*,[8] an online *Seating and Mobility Academic Resource Toolkit*,[9] development of a *Joint Position Paper*, a basic Wheelchair Service Provision Test and a Wheelchair Service Provider Credential. The ultimate goal of this work is to improve the wheelchair service provision process worldwide through enhanced education of wheelchair service providers. An interactive discussion whereby participants will be invited to share their experiences with providing or receiving wheelchair service provision education in their context will be facilitated. How the ISWP resources may be of use to participants will also be explored and discussed.

Content references:

1. World Health Organization. Global Cooperation on Assistive Technology (GATE). Geneva:WHO; 2018 [cited 2018 December 3]. Available from: http://www.who.int/phi/implementation/assistive_technology/phi_gate/en/
2. World Health Organization. Global priority research agenda for improving access to high-quality affordable assistive technology. Geneva: WHO; 2017.
3. Scherer MJ, MacLachlan M, Khasnabis C. Introduction to the special issue on the first Global Research, Innovation, and Education on Assistive Technology (GREAT) Summit and invitation to contribute to and continue the discussions. Disabil Rehabil Assist Technol 2018; 13:5, 435-436.
4. World Learning. Wheelchair Stakeholders' Meeting: Meeting Report. 2018.
5. Goldberg M, Pearlman J, Rushton PW, Cooper R. The International Society of Wheelchair Professionals (ISWP): a resource aiming to improve wheelchair services worldwide. BJOT 2018;81: 671-672.
6. Fung KH, Rushton PW, Gartz R, Goldberg M, Toro ML, Seymour N, Pearlman J. Wheelchair service provision education in academia. AJOD 2017; 6, a340. http://doi.org/10.4102/ajod.v6i0.340.
7. Fung K, Miller T, Rushton PW, Goldberg M, Toro MT, Seymour N, Pearlman J, The 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 2019; accepted.
8. Wheelchair International Network. https://wheelchairnetwork.org/
9. Seating and Mobility Academic Resource Toolkit. http://smart.wheelchairnetwork.org/

C7: What does the wound tell us?

Kathy Young, OT
Kim Vien, OT

Learning objectives:

1. To understand and assess the risk factors contributing to pressure injuries for wheelchair users.
2. To develop clinical reasoning skills when providing a pressure injury prevention or management plan for existing wounds.

Session description:

This session sets out to explore the complexities of assessing pressure injuries and associated risk factors for wheelchair users. Users with a history of pressure injuries require pressure injury management solutions that assist to maintain function without further compromising the health of their skin. The session will look at a systematic approach to pressure injury assessment and intervention. This will include how to work with wound management clinicians, conducting skin checks, and understanding the stages of the wound healing process. Case studies presented will priorities the potential pressure injury prevention and management strategies to serve a variety of user needs. Common risk factors such as asymmetrical postures, scar tissue, shear and friction as well as moisture management will be included.

Content references:

1. Romanelli, Clark, Gefen , Ciprandi- Science and Practice of pressure Ulcer Management – second edition . Springer- Verlag London 2018.
2. Kottner, J, Black, J, Call et al . A critical review in the context of pressure ulcer prevention. Clincal Biomechanics 59(2018) 62-70 2018 .
3. Nguyen K-H et al., Australian Health Review, 2015, 39, 329–336 Van Den Bos J et al., Health Affairs 2011; 30(4): 596-603
4. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. 2014. ©2015 National Pressure Ulcer Advisor Panel www.npuap.org

C8: Body Segment Angles: The key to understanding Postural Deviations in the Sagittal Plane

Kelly Waugh, PT

Learning objectives:

1. Participants will be able to translate a hip flexion angle measure from a mat exam into a thigh to trunk angle measure.
2. Participants will be able to define and explain the differences between the thigh to trunk angle, thigh to pelvis angle, and sagittal pelvic angle.
3. When provided with two hypothetical measures of thigh to trunk angle and thigh to pelvis angle, participants will be able to determine if the seated person's posture is kyphotic or lordotic.

Session description:

What is the difference between the thigh to trunk angle, thigh to pelvis angle, and sagittal pelvic angle? How do they relate to true hip flexion and posterior pelvic tilt? In this webinar, I'll first review the difference between joint range of motion and body segment angles so that you can relate mat exam findings to seated posture and wheelchair seating angles. Then we will delve deeper into the distinctions between the relative body segment angles of the trunk, pelvis and thigh, and how these angles relate to typical postures of the spine and pelvis such as kyphosis, lordosis, and posterior or anterior pelvic tilt. Being able to visualize and measure these angles can help you to better understand and describe complex postural deviations, which will improve your ability to provide appropriate seating interventions. A case study will be used to demonstrate the clinical application of these concepts.

Content references:

1. 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 (363 pgs). Available from: www.assistivetechnologypartners.org
2. Waugh, K., Bach, J. (2014) *Results of a pilot feasibility study to evaluate the accuracy and reliability of seated posture measurement using existing and emerging tools.* The 30th International Seating Symposium Syllabus Proceedings, pp.110-112
3. Waugh, K. and Crane, B. (2018) Standardized measures of the person, seating system and wheelchair. In M.L. Lange & J. Minkel (Eds.), *Seating and wheeled mobility: A clinical resource guide* (pp. 85-120). Thorofare, NJ: Slack Incorporated.

P1: Back Supports – Off the Shelf or Custom?

Faith Saftler Savage, PT

Learning objectives:

1. Be able to differentiate between hands free, hands dependent and prop sitters
2. Be able to list the properties of various off the shelf and custom backs
3. Demonstrate the ability to choose an appropriate back support to meet the user's needs

Session description:

Back supports are a critical component of the seating system and are often poorly fitted. This course discusses the different types of sitters (hands free, hands dependent and prop sitters) and the amount of back support that is needed for each of these sitters. The properties of the off the shelf and custom back supports are discussed to assist in determining which option will best fit the person' back support needs. Properties include surface shape, stability (firmness) and mounting method as well as width, height and depth of the support. Improving the fit of the back support will decrease back pain, improve skin integrity and improve overall trunk posture and stability for optimal function.

Content references:

1. Seating and Wheeled Mobility – A Clinical Resource Guide, Michelle Lange and Jean Minkel
2. A Clinical Application Guide to Standardized Wheelchair Seating Measures of the Body and Seating Support Surfaces – Kelly Waugh and Barbara Crane
3. Physical Rehabilitation – Susan B. O'Sullivan, Thomas J. Schmitz and George D. Fulk – Chapter 32 Seating and Wheeled Mobility – Laura J. Cohen and Faith Saftler Savage

P2: Exploring Postural Care: A Family-centred Practice for Young Children with Physical Disability

Denise Luscombe, PT

Learning objectives:

1. For participants to be able to understand the sterno-spinal line and its impact, combined with gravity, on body shape
2. For participants to understand the importance of building the capacity of families when applying postural care principles
3. For participants to be introduced to a framework for applying postural care principles with children with physical disability

Session description:

Postural care is protecting the body shape of children and adults with movement problems. Supported lying is described as 'aligning the body in a comfortable non-destructive position in bed' (Stephens et al, 2018). The current evidence base for supported lying is limited, but growing (Blake et al, 2015). The National Institute for Health and Care Excellence (NICE) guidelines have recognised the role of postural care in the prevention of secondary complications including premature death. Body shape distortions continue to be a significant area of concern when working with children with physical disability. Children spend a significant proportion of their day in bed (often up to 16 hours), and their lying posture can have a distorting effect on their body shape and structure. Children with mobility challenges require positioning based on known principles to prevent destructive body posture changes. Family members need to be educated on how to position their child, and involved in monitoring their child's posture. This presentation will utilise a case study format of a two year old child with cerebral palsy to highlight the principles of preventative postural care, impact of application on his medical and postural needs, and the importance of being family-centred. A framework for clinical practice will be clearly described to ensure that the partnership between family and professional leads to the best possible outcomes for the child.

Content references:

1. Blake S, Logan S, Humphreys G, Matthews J, Rogers M, Thompson-Coon J, et al. Sleep positioning systems for children with cerebral palsy (Review). Cochrane Database of Systematic Reviews [Internet]. 2015; (11).
2. Stephens, M., Bartley, C.A., and Priestley, C. (2018). Evaluation of night time therapeutic positioning system for adults with complex postural problems. Monograph. http://usir.salford.as.c.uk/48470/
3. https://www.nice.org.uk/guidance/cg145
4. https://www.nice.org.uk/guidance/ng62

P3: An innovative approach to providing customised commode seating

Stacey Burr, OT
Alex Hayes, Eng
Jane Sander
Richard Sutton

Learning objectives:

1. Provide information on a customised alternative option to commercial products
2. Understand the process of design of a customised commode seat
3. Understand how pressure mapping can influence design of customised products

Session description:

Standard commode seats are fine if you don't need to spend long on them and your skin is in good condition. Pressure injury is a common complication for people with Spinal Cord Injury. It is essential that all support surfaces provide the best available pressure redistribution. This client had a major pressure injury and spent 7 months in hospital as a result of having to have 2 surgeries (debridement and rotation flap) then extensive rehabilitation to get back to normal sitting regime and functional activity. Commode seats typically can cause pressure injury and in this case pressure mapping indicated these were not providing adequate pressure distribution. A customised commode seat was needed.
The process involved pressure mapping using the, taking an impression using a bean bag mould technique, scanning the impression and using a Qube® design program to manipulate the object to come up with a design. This was then carved using a robotic CNC machine to produce a prototype. This was then checked again with mapping and improved pressure distribution noted vs commercial products. The result was a commode seat that enabled the client to complete daily functional tasks with reduced risk of pressure injury.

Content references:

1. Friesen, E., Theodoros , D., & Russell, T.. "Clinical Assessment, Design and Performance Testing of Mobile Shower Commodes for Adults with Spinal Cord Injury: An Exploratory Review." Disability and Rehabilitation: Assistive Technology 8.4 (2013): 267-74.
2. Houghton PE, Campbell KE, & CPG Panel (2013). Canadian Best Practice Guidelines for the Prevention and Management of Pressure Ulcers in People with Spinal Cord Injury. A resource handbook for Clinicians. Pages 124 Accessed at http://www.onf.org on 18/10/2018
3. Pressure Ulcer Prevention and Treatment Following Injury: A Clinical Practice Guideline for Health-Care Providers Second Edition (2014) Consortium for Spinal Cord Medicine Clinical Practice Guidelines – page 66

P4: The Impact of Power Assist on a Wheelchair User

Maria Whitcombe-Shingler, OT
Annette Semadeni-Davies

Learning objectives:

1. To share Annette's experiences of being assessed for, trialling and using power assist.
2. To share the experience of using the Wheelchair Outcome Measure (WhOM), from a client and therapist perspective.
3. To discuss the benefits of power assist options.

Session description:

Annette as the client, and Maria in the therapist, share the journey of identifying the need for, and trialling power assist options to access work, public transport and the wider community. Qualitative single case study design was used with the WhOM (Wheelchair Outcome measure) as one of the outcome measures.

Content references:

1. Baxter, P. & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. The Qualitative Report, 13(4), 544-559
2. Mortenson, W.B., Miller, W., & Miller-Pogar, J. (2007). Measuring wheelchair intervention outcomes: Development of the Wheelchair Outcome Measure. *Disability and Rehabilitation: Assistive Technology*, 2(5), 275-285.doi:10.1080/17483100701475586 3
3. Arledge, S., et al. (2011). RESNA Wheelchair Service Provision Guide. Retrieved from https://eric.ed.gov/?id=ED534426on the 31st March, 2017.

P5: Technician Certification – where are we at in New Zealand?

Matthew Macpherson, ATP

Learning objectives:

1. To have an understanding of the technician credentialing and certification process in North America and how it can adapt to other countries as needed.
2. To describe the minimum certification qualifications to take exams for the 2 different levels of technicians.
3. To have knowledge of sites and locations of content for both the exams and where to access the online learning as needed.

Session description:

Repair technicians play a crucial part in ensuring people with disabilities have safe and reliable equipment and that clients and therapists are supported in the reconfiguration and adjustment of mobility and positioning products. Stakeholders, in addition to service users, include equipment suppliers, assessment services, retailers of disability equipment, rest homes and hospitals, and community organisations. With no recognized technician training available in New Zealand, competency development is often left to individual employers with manufacturer specific training provided by suppliers. This approach means there is no consistent content being taught, no recognized assessment process, and no technician qualification. In-person training requirements have also been identified as a barrier to access, nationally.

A recognized technician certification has been developed in North America and the unification of efforts from across the industry has led to the formation of a credentialing body – the Durable Medical Equipment Repair Technician (DMERT) Group, that manages the professional development of technicians in North America. The certification courses are offered as an online option including a theory and practical exam.

This poster will describe the foundation of the Level 1 and Level 2 DME Repair Technician online certification courses including the training methods and materials. It will outline how a collaboration with New Zealand Stakeholders has resulted in the certification being considered for NZQA approval, with a proposed local private training establishment, My Skill Limited, providing access to the online courses across New Zealand and Australia.

Content references:

1. http://www.hmenews.com/article/dmert-group-set-launch-complex-rehab-certification
2. https://www.homecaremag.com/news/new-certification-body-crt-technicians-launches
3. https://www.dmertgroup.com/
4. https://hme-business.com/articles/2018/05/23/dmetraining.aspx
5. https://www.fiosdmert.com/

ABSTRACTS
WEDNESDAY 13TH NOVEMBER

Plenary: Aviator – a smart wheelchair

Professor Hung Nguyen

Session description:
In this presentation, three advanced applications using real-time control of a smart wheelchair are described. The first application involves a thought-controlled wheelchair using brain computer interface. The system used a Hilbert-Huang transform for feature extractor and fuzzy particle swarm optimization for the classifier. Experiments were conducted on five able bodied subjects and five patients with tetraplegia using EEG signals from six channels, and different time-windows of data were examined to find highest accuracy. The second application involves assessing brain wave activity for monitoring fatigue when performing tasks such as driving. We investigated brain wave activity associated with fatigue in 48 healthy drivers as they participated in a simulated driving task until they fatigued. The results suggest that as a person fatigues, the brain loses capacity and slows its activity, and that attempts to maintain vigilance levels lead to increased beta activity. Thus, an autonomous system has also been developed to allow the wheelchair to avoid collisions while simultaneously navigating through an unknown environment in real-time. The third application concerns the development of a telepresence wheelchair system which is capable of real-time video communication and remote interaction. This would allow a care giver to observe the environment around a wheelchair user remotely in real-time, and to be able to intervene if required over the Internet. Essentially, these futuristic applications for smart wheelchairs unlock a fascinating and exciting future for assistive technology.

Speaker biography:
Professor Hung Nguyen is Pro Vice-Chancellor for the Faculty of Science, Engineering & Technology at Swinburne University of Technology. Giving people with severe disability greater independence and control has been the central aim of his working life for the past 20 years. Specialising in the field of medical inventions, Hung is responsible for Aviator, the smart thought-controlled wheelchair, which is designed to improve the lives of paraplegics and quadriplegics, especially for those unable to use their hands. His other inventions include a non-invasive diabetes monitoring system, and a system for monitoring and preventing driver fatigue. Hung was appointed a Member of the Order of Australia in 2002 and was awarded the 2016 Chancellor's Medal for Exceptional Research at the University of Technology Sydney (UTS). He was Assistant Deputy Vice-Chancellor (Innovation) (2014-2017) and Dean of the Faculty of Engineering and Information Technology (2010-2014) at UTS, and was Founder/Executive Director of AIMedics Pty Ltd (2001-2006). He is a Fellow of the Institution of Engineers, Australia, the Australian Computer Society and the British Computer Society.

Plenary: The intersection of pain and disability

Dr Harry Eeman

Session description:
A modern understanding of chronic pain and its management requires us to approach chronic pain using a whole person context, that is through a sociopsychobiomedical paradigm. Chronic pain is simply not reducible to “body bits being injured”. A neuroscientific explanation of ‘pain without injury’ is well understood but the social drivers that turn on these mechanisms less so.

Like pain, disability will be experienced differently by the individual regardless of the specific impairment. An exploration of the intersection between pain and disability will be discussed. This will be informed by reflections of my own journey as a person with a disability and as a senior medical specialist working in the field of pain medicine. Practical tips on managing complex clients will be provided.

Speaker biography:
Harry was a young medical student when he was struck down by a severe form of Gillian Barre Syndrome whilst backpacking in Europe. He spend the next 2½ years in hospital, 5 months of which were spent on a ventilator, paralysed in what externally presented as a coma-like state except that he could hear those around him. After years of rehabilitation he recommenced his studies and completed medicine as a quadriplegic which required overcoming a number of physical and attitudinal barriers. Eventually he graduated with honours and subsequently completed two postgraduate specialist qualifications. He hopes to be able to inspire people who face similar obstacles in their lives by working as a Rehabilitation Medicine Physician. He also works to empower people suffering from chronic pain and is now the acting Clinical Director of a large chronic pain management unit in a major metropolitan in hospital in Melbourne. All of this he juggles with living independently and trying to be the best father he can be to his two year old son.

Content references:

1. Youtube clip: Understanding pain in less than 5 minutes and what to do about it
2. Carr DB, Bradshaw YS. Time to flip the pain curriculum? Anesthesiology. 2014;120:12–4. [PubMed] [Google Scholar]

D1: Active Controls Center Drive: The Biomechanical Benefits

Lauren Hunter, OT

Learning objectives:
During this session participants will:

1. Develop an understanding of how traditional armrest mounted joystick controllers contribute to muscular skeletal disorders (MSD)
2. Understand the research behind Active Controls, validating their claims to assist in preventing and amending MSD, as well as the associated benefits of driving a powered wheelchair at midline
3. Be introduced to Active Controls technology and some of the alternative drive controls available

Session description:
The Clinical Study completed by Dr Alfredo Esquenazi, is the basis behind our claims of both preventing and amending muscular skeletal conditions for power wheelchair (PWC) drivers. Traditional PWC armrest mounted joystick controllers force a change in body posture and weight distribution with deleterious effects over time. The Active Controls Center Drive System was developed to allow midline mounting for PWC joysticks and alternative drive controls. There are several benefits to operation of PWC at midline, including postural alignment, weight distribution, improved operator intuition and functional position that aligns the visual field with the center of the chair's travel path.

Content references:

1. Moore, M.G., Esquenazi, A., & Greenberg, N.A. (2016). Poster 110-B Biomechanical and Functional Benefits of Central Location of Power Wheelchair Drive Controls. PM R. 2016 Sep;8(9S):S327. doi: 10.1016/j.pmrj.2016.08.010. Epub 2016 Sep 24.
2. Gonçalves, J.S., Moriguchi, C.S., Takekawa, K.S., Cote Gil Coury, H.J., & Sato, T.O. (2017). The effects of forearm support and shoulder posture on upper trapezius and anterior deltoid activity. Journal of Physical Therapy Science, May; 29(5): 793–798.
3. Kovacs, F.M., Seco, J., Royuela, A., Barriga, A., & Zamora, J. (2018). Prevalence and factors associated with a higher risk of neck and back pain among permanent wheelchair users: a cross-sectional study. Spinal Cord, 56, 392-405.
4. Gibson, J., & Frank, A. (2006). Pain experienced by electric-powered chair users: a pilot exploration using pain drawings. Physiotherapy Research International, 10(2), 110-115.

D2: Validation of a Simulator for Powered Mobility for Children

Naomi Gefen
Prof. Philippe S. Archambault
Prof. Patrice L. (Tamar) Weiss

Learning objectives:
Upon completion of this session, the participant will be able to:

1. Identify three advantages of a simulator for powered mobility practice for children
2. Outline how the validity of the MiWe-C was tested
3. Describe the MiWe-C simulator and its' usability with children

Session description:
Background- Some children with severe motor impairments lack the ability to attain independent mobility. For these children, powered mobility can be a suitable solution. To become a proficient driver, sufficient practice time is needed and when access to chair and therapist time is limited, it may be a challenge. Simulator based practice for adults has proven to be a viable option in many areas (pilots, physicians), including powered mobility. This study aims to validate the McGill Immersive Wheelchair Simulator for children (MiWe-C). Specifically, it was hypothesized that there would be no significant difference between powered wheelchair driving performance measured in the MiWe-C and in the real world

Methods- The study was a single-center cross-sectional study approved by the research ethics board of ALYN Hospital and the University of Haifa. Participants included 26 children aged 5-18 years (mean 14.0, SD 3), with a physical disability (Cerebral Palsy, Spinal Cord Lesion, Neuro Muscular Conditions). All children used a joystick to drive their own powered wheelchair and had at least three months of driving experience at the time of testing. Children using switches or a scanning device were excluded.

Procedure: Driving performance was measured as the participants drove their powered wheelchair (PW) through a predefined route followed by the same route on the MiWe-C simulator. Participants were evaluated through two powered mobility tests: a) The Powered Mobility Program (PMP)(PW and MiWe-C) , and b) the Assessment of Learning Powered Mobility (ALP) (PW) .
The results revealed high PMP scores for both the PW and MiWe-C conditions (mean 5.0, SD 0.1; mean 4.9, SD 0.2, respectively). The Wilcoxon Signed ranks test revealed no significant difference between the mean scores of the 32 tasks between the PW and MiWe-C conditions. The Spearman's rank revealed positive significant correlations between the mean ALP score with the mean PW PMP score (rs=.51, p=0.01), and with the mean MiWe-C PMP score (rs=.48, p=0.01). The results from the current study demonstrate the validity of the MiWe-C in comparison to driving a PW using the PMP, a well-accepted evaluation outcome measure of powered mobility driving skills.

Significance: This validation process supports the original study done on the MiWe where driving and simulator-based tasks were performed and compared with adults. Having a validated simulator for children to practice PM provides a viable option for children that do not have access to a powered wheelchair.

Content references:

1. 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.
2. Butler, C., Okamoto, G. A., & McKay, T. M. (1983). Powered mobility for very young disabled children. Developmental Medicine & Child Neurology, 25(4), 472-474.
3. Cook, D., Hamstra, S., Brydges, R., Zendejas, B., Szostek, J., Wang, A., Hatala, R. (2013). Comparative effectiveness of instructional design features in simulation-based education: Systematic review and meta-analysis. Medical Teacher, 35(1), 867-898.
4. Pithon, T., Weiss, T., Richir, S., & Klinger, E. (2009). Wheelchair simulators: A review. Technology and Disability, 21(1, 2), 1-10.
5. Inman, D., Loge, K., Cram, A., & Peterson, M. (2011). Learning to drive a wheelchair in virtual reality. Journal of Special Education Technology, 26(3), 21-34.
6. Rodriguez, N. (2015). Development of a wheelchair simulator for children with

multiple disabilities. Virtual and Augmented Assistive Technology (VAAT), 2015 3rd IEEE VR International Workshop On, 19-21.
7. Archambault, P.S., Tremblay, S., Cachecho, S., Routhier, F., & Boissy, P. (2012). Driving performance in a power wheelchair simulator, Disability and Rehabilitation: Assistive Technology, 7(3), 226-233.
8. Archambault, P. S., Blackburn, É., Reid, D., Routhier, F., & Miller, W. C. (2017). Development and user validation of driving tasks for a power wheelchair simulator. Disability and rehabilitation, 39(15), 1549-1556.

D3: Winter wheelchair accessibility: a web-based application

Ed Giesbrecht
Jacquie Ripat

Learning objectives:

1. Participants will be able to identify at least 3 winter-specific barriers to wheelchair mobility.
2. Participants will be able to describe benefits of using a web-based resource for knowledge generation and translation among wheelchair users.
3. Participants will be able to distinguish knowledge, strategies and products as they relate to winter wheeled mobility.

Session description:

Winter weather creates challenges to mobility above and beyond the natural and built environment. Snow, ice, wind and cold create barriers to wheelchair use that negatively impact participation and quality of life, and require unique solutions.1,2,3 Unfortunately, evidence to inform consumers, clinicians and researchers on best practice is limited and difficult to access.4,5 To address this need, a multi-stage mixed-methods project was undertaken to create a web-based winter accessibility toolkit. Phase one involved compilation of available knowledge, products and strategies related to winter mobility through a scoping review. Phase two engaged 24 mobility device users in five asynchronous online focus groups, iteratively reflecting and responding to daily questions posted over the course of one week. Informed by the ICF framework, phase one findings, and published literature, the discussion board questions asked respondents to identify barriers and solutions for winter mobility. Emergent categories and themes, developed through content analysis, were used to construct and organize the subsequent toolkit. A prototype web application was generated in phase three, using a Rapid Prototyping Methodology.6 A media expert was used to generate a series of prototypes; each iterative format was reviewed by a different stakeholder group via online survey, providing suggestions for revision. This presentation will highlight critical elements that contributed to development of the toolkit. The current version of the toolkit will be showcased, attending to both content and delivery format. We will discuss the value of enabling peer-to-peer sharing and problem-solving around strategies and technology to promote winter mobility, as well as the challenges and opportunities of delivering and sustaining a web-based toolkit.

Content references:

1. Lemaire ED, O'Neill PA, Desrosiers MM, Robertson DG. Wheelchair ramp navigation in snow and ice-grit conditions. Arch Phys Med Rehabil 2010;91(10):1516-1523.
2. Ripat J, Brown C, Ethans K. Barriers to wheelchair use in the winter. Arch Phys Med Rehabil 2015;96(6):1117-1122.
3. Ripat J, Borisoff JF, Grant LE, Chan FHN. Patterns of community participation across the seasons : A year-long case study of three canadian wheelchair users. Disabil Rehabil. 2018;40(6):722-731. doi:10.1080/09638288.2016.1271463
4. Lindsay S, Yantzi N. Weather, disability, vulnerability, and resilience: exploring how youth with physical disabilities experience winter. Disabil Rehabil 2014;36(26):2195-2204.
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6. Plaisance A, Witteman H, Heyland D, Ebell M, Dupuis A, Lavoie-Berard C, Legare F, Archambault P. Development of a decision aid for cardiopulmonary resuscitation involving intensive care unit patients' and health professionals' participation using user-centered design and a wiki platform for rapid prototyping: A research protocol. JMIR Res Protoc 2016 Feb 11;5(1):e24.

D4: Correlation of Trunk Control and Daily Activity/Participation after Adaptive Seating System Provision

Rumrada Inthachom , PT
Saipin Prasertsukdee, PT
Stephen E. Ryan
Jaranit Kaewkungwal

Learning objectives:
At the completion of this session, attendees will be able to recognize:

1. The strength of the relationship between trunk control and activities/participation after adaptive seating system provision;
2. The importance of adaptive seating system provision in relation to functional outcomes; and,
3. The use of two standardized tools for the measurement of different aspects of functioning following adaptive seating interventions.

Session description:
Objectives: The purpose of this study was to investigate the correlation between trunk control in sitting and activities/participation three months after adaptive seating system provision in children with non-ambulatory cerebral palsy. Study Design: Cross-sectional study. Study Participants & Setting: The purposive sample included 20 children with Gross Motor Function Classification System level IV-V cerebral palsy (mean age = 4.5 years) who received their first-time adaptive seating devices and their primary caregivers. Materials/Methods: Three months after adaptive seating systems provision, a trained clinical assessor examined the trunk control of child participants using the Segmental Assessment of Trunk Control (SATCo) for static, active, and reactive tasks. Primary caregivers were also interviewed about their child's activity/participation using the daily activity and social/cognitive domains of the Pediatric Evaluation of Disability Inventory Computer-Adaptive Test (PEDI-CAT). The associations of total scores of the SATCo and PEDI-CAT were estimated using Spearman correlations. Results:
Data revealed moderate to high correlations between aspects of trunk control and the daily activity and social/cognitive content areas. Levels of static trunk control and social/cognitive functioning were significantly correlated ($\rho = 0.585$, $p < 0.01$). Levels of reactive trunk control and daily activity ($\rho = 0.644$, $p < 0.01$) and social/cognitive ($\rho = 0.691$, $p < 0.01$) content areas were also significantly correlated. No significant associations were found between active trunk control and the two PEDI-CAT domains.
Conclusions/Significance: Children with non-ambulatory CP who demonstrate better trunk control after receiving adaptive seating systems tend to show higher levels of activity and participation.

Content references:

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2. Ryan, S.E. An overview of systematic reviews of adaptive seating interventions for children with cerebral palsy: Where do we go from here? Disability and Rehabilitation: Assistive Technology. 2012;7(2):104-11.
3. Butler, P.B., Saavedra, S., Sofranac, M., Jarvis, S.E., Woollacott, M.H. Refinement, reliability, and validity of the segmental assessment of trunk control. Pediatric Physical Therapy Association. 2010;22(3):246-57.
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D5: Power Fun: a therapeutic summer camp enabling children with severe disabilities learn powered mobility skills

Lori Rosenberg
Yafit Gilboa

Learning objectives:
Upon completion of this session the participants will be able to:

1. Explain the importance of powered mobility for children with severe limitations
2. Discuss the theoretical models on which Power Fun, a therapeutic mobility summer camp, is based.
3. Demonstrate how to implement powered mobility sessions based on the Power Fun protocol

Session description:
Powered mobility (PM) allows children with limited independent locomotion a means of mobility, providing opportunities for engagement in meaningful life experiences and promoting, cognitive, visual, perceptual, psychological, social and motor development. Children with severe Cerebral Palsy (CP) commonly have motor, perceptual or cognitive impairments, which make learning PM difficult, as these are precisely the skills that predict proficiency in PM. To add to the problem, therapists often assume that children with multiple disabilities will not succeed in attaining the necessary PM skills, and thus they do not even get a chance to try it. This is liable to place them in a negative loop, which PM training might possibly reverse.

Research has shown that children can learn PM, but almost all either involved pre-schoolers or used high technology such as smart chairs or simulators. Power Fun, a therapeutic powered mobility summer camp, provides a pragmatic solution to enable school aged children with severe disabilities to learn powered mobility.

In this session Power Fun's protocol will be presented, the underlying theories on which the project was developed will be explained, and participants will learn how these theories are incorporated. The assessments used will be presented (Power Mobility Program (PMP), Assessment of Learning Power mobility use (ALP), The Wheelchair Outcome Measure for Young People (WhOM-YP), Goal Attainment Scaling (GAS) and qualitative interviews). Participants will learn how the therapeutic camp was set up and be shown the activities involved, with discussion as to how these can be expanded to suit varying age ranges and abilities. Finally, the research study on which Power Fun is based will be presented. Participants will be encouraged to share their own professional experience and will receive the Power Fun protocol.

Content references:

1. Field, D. A., & Livingstone, R. W. (2018). Power mobility skill progression for children and adolescents: a systematic review of measures and their clinical application. Developmental Medicine and Child Neurology, 60(10), 997–1011. https://doi.org/10.1111/dmcn.13709
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D6: Power Assist/Add On Manual Wheelchairs: What's the Go?

Amy Bjornson, PT

Learning objectives:

1. Participant will be able to describe the 3 types of power systems that can be added to manual wheelchairs
2. Participant will be able to match 2 client criteria/goals to the most appropriate power add on system
3. Participant will be able to list 2 training strategies for use of power assist systems

Session description:

Power assist and power add on systems have rapidly evolved in recent years. Just a decade ago, these systems were rare. Now they are commonly considered as an alternative to a power wheelchair or as a method of making a manual wheelchair a more functional option. This workshop will define the various categories, focusing on the functionality and the clinical implications. We'll look at what type of client can benefit from this technology, training strategies to maximize effectiveness and include tips for successful funding approval.

This workshop will focus on the science and technology of Power Assist and Power Add On systems for manual wheelchairs. We'll look at the design and clinical application of both technologies and their ability to promote sustainable, functional outcomes.

Content references:

1. Koontz AM, Roche BM, Collinger JL, Cooper RA, Boninger ML. Manual wheelchair propulsion patterns on natural surfaces during start-up propulsion. Arch Phys Med Rehabil 2009; 90(11):1916-23.
2. Ki-Tae Nam, Dae-Jin Jang, Yong Chol Kim, Yoon Heo, and Eung-Pyo Hong A Study of a Handrim-Activated Power-Assist Wheelchair Based on a Non-Contact Torque Sensor, Sensors (Basel). 2016;16(8):1251. Published 2016 Aug
3. Kloosterman M.G., Snoek G.J., van der Woude L.H., Buurke J.H., Rietman J.S. A systematic review on the pros and cons of using a pushrim-activated power-assisted wheelchair. Clin. Rehabil. 2013; 27: 299–313

D7: Don't Let Back supports Take the "Back Seat" in a Seating Assessment

Jane Fontein, OT

Learning objectives:
Upon completion of the workshop, the participant will be able to:

1. List 3 bony prominences important for back support measurement
2. List at least 3 measurements of clients critical for back support prescription
3. List at least 3 properties of back supports and their clinical impact for a client.

Session description:
The presentation will explore the properties of back supports and their impact on seating and positioning. Through demonstration and discussion the attendees will assess the differences from sling upholstery, tension adjustable, and rigid backs. An in depth look at the anatomy of the back and the key bony prominences that are important for back support assessments. Measurements to obtain for a variety of spinal deformities including kyphosis/scoliosis/lordosis and bariatric situations will be reviewed. Back support properties and their clinical implications will be explored. Is a tall back needed if the client is tall? Where is support needed? What angles and lateral supports are required? Does a rigid back improve propulsion efficiency for manual wheelchair users? There will be hands on portion finding the bony prominences as well as measurement exercises on each other.

Content references:

1. Macauley, Jacqueline PT., ATP ."Do You Have Your Client's Back?" 27th International Seating Symposium March 3-5, 2011
2. Kerstu /Samyeksiibm, Marrut Bjork, Ann-Marie Erdugan, Anna-Karin Hansson & Birgitta Rustner "The effect of shaped wheelchair cushion and lumbar supports on under-seat pressure, comfort, and pelvic rotation", Faculty of Health Sciences, Department of Clinical and Experimental Medicine, Rehabilitation Medicine, Linkoping, Sweden,and Clinical Department of Rehabilitation Medicine, University Hospital, Linkoping, Sweden Disability and Rehabilitation: Assistive Technology, September 2009; 4(5): 329–336
3. Yu-Sheng Yang, PhD, Alicia M. Koontz, PhD, Shan-Ju Yeh, BS, Jyh-Jong Chang, PhD." Effect of Backrest Height on Wheelchair Propulsion Biomechanics for Level and Uphill Conditions" Physical Medicine and Rehabilitation, April 2012Volume 93, Issue 4, Pages 654–659
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6. PMAT developed by Jennifer Birt, OT Reg (MB), Specialized Seating and Mobility Clinical SpecialistRehabilitation Day Program, Health Sciences Centre, Winnipeg, Manitoba ©Jennifer Birt 2011mailto:JLBirt@exchange.hsc.mb.ca

D8: The use of lying supports with people over the age of 65

Rachel Brown, OT

Learning objectives:
Upon completion of the session participants will be able to:

1. Identify four key factors to consider when assessing people over the age of 65 for lying supports.
2. Name one potential goal when using lying supports with a person over the age of 65.
3. Describe the potential positioning and lying supports to consider for someone over the age of 65 with multiple sclerosis or Parkinson's disease.

Session description:
In New Zealand the over 65 age group is one age bracket used by the Ministry of Health (MOH) for funding. Lying supports are a critical component of 24-hour postural management for this group due to the potential for them to spend longer in bed. Older people living in residential care have been found to spend nearly 11 hours in bed and a greater variance of time was found amongst residents that needed assistance (1). Other studies have highlighted the amount of time residents spent in bed during the day (2 & 3).

It has been identified that elderly people with minimal or no ability to change their position or maintain sitting or standing will benefit from 24-hour postural management (4). However, limited research exists on lying supports for people over the age of 65. A systematic review on sleep positioning for children and adults with a neurodisabilty found only one article including older age groups (5). This study included three adults over the age of sixty-five and reported improvements in the ability to lie straight, improved pressure and reduced spasm, when using the equipment (6). Of the eight aged care residents in the Brightwater study, four had improvements in chest symmetries, five in pelvic stability, one in sitting posture, another in standing transfers and repositioning at night was decreased (7).

Lying supports are funded for people over the age of 65 with long term disabilities by the MOH. Enable New Zealand statistics around this provision were sourced from a two year period to identify the age of people, number and type of items issued and number of people in care.

The International Classification of Function will be used to identify factors to consider when assessing people over the age of 65 for lying supports and goals will be shown.

Sleep (8, 9, & 10) and specific interventions for people with multiple sclerosis, Parkinson's disease and dementia will be discussed, with some general intervention statements on lying supports made.

Content references:

1. Luff, R., Ellmers, E., Eyers, T., Young, E. & Arber, S. (2011). Time spent in bed at night by care-home residents: Choice or compromise? Ageing & Society, 31(7), 1229-1250.
2. Schnelle, J. F., Cruise, P. A., Alessi, C. A., Ludlow, K., Al-Samarri, N. R. & Ouslander, J.G. (1998). Sleep hygiene in physically dependent nursing home residents: Behavioural and environmental intervention implications. Sleep, 21(5), 515-523.
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5. Humhreys, G., King, T., Jex, J., Rogers, M., Blake, S., Thompson-Coon, J. & Morris, C. (2018). Sleep positioning systems for children and adults with a neurodisablity: A systematic review. British Journal of Occupational Therapy. 1-10.
6. Innocente, R. (2014). Night-time positioning equipment: A review of practices. The New Zealand Journal of Occupational Therapy, 61(1), 13-21.
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9. Sommerauer, M., Werth, E., Poryazova, R., Gavrilov, Y. V., Hauser, S., & Valko, P.0. (2015). Bound to supine sleep: Parkinson's disease and the impact of nocturnal immobility. Parkinsonism and Related Disorders. 21, 1269-1272.
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D9: Customized Alternative Positioning for 24 Hour Posture Management

Faith Saftler Savage, PT

Learning objectives:

1. Identify individuals who need customized supports for postural management
2. Identify positioning options for individuals with significant deformities
3. Understand how to measure for customized supports

Session description:

Twenty-four-hour postural management for individuals with disabilities is critical to assist in preventing significant deformities. What happens when a postural management program isn't followed, a postural management program was never developed, an individual goes through a significant growth spurt or tonal changes affect a person' posture? What positioning will be beneficial to counter the effects of poor positioning over time? This course will discuss daytime alternative positioning that needs to be customized to improve range and flexibility. Sidelying, prone on forearms and quadruped on forearms will be discussed for other options to begin to decrease deformities as well as the customizations needed to begin to improve alignment, comfort and reduce pressure areas.

Content references:

1. Seating and Wheeled Mobility – A Clinical Resource Guide, Michelle Lange and Jean Minkel – Chapter 7 (Posture Management 24/7)
2. Rehab Management – 24-Hour Posture Care Management: Supporting People Night and Day, Tamara Kittelson-Aldred and Lee Ann Hoffman, September 2017

E1: Paediatric powered mobility interventions across a range of abilities: the power to get going and enjoy life

Lori Rosenberg
Naomi Gefen

Learning objectives:
Upon completion of this session the participants will be able to:

1. Discuss the appropriate type of powered mobility training needed for children across the span of abilities
2. Choose and/or adapt environments to allow learning of powered mobility skills
3. Grade games and activities that will enhance learning power mobility skills at different levels

Session description:
Background: Powered mobility is important to allow children with locomotive restrictions access to opportunities to develop and participate. It can help reverse the negative loop described by Nisbet (2002) between lack of mobility- reduced opportunities – lack of stimuli- developmental delay and create a positive spiral described by Livingstone and Field (2015) of mobility- development - participation. It has been shown to be important both for severely disabled children who have almost no mobility as well as those more able, who need to incorporate powered mobility in multiple environments. Researchers have defined these different groups according to how they learn – exploratory learners, operational learners and functional learners.

In this session we will look at children across a range of abilities and examine how powered mobility can help, as seen through research and clinical experience. We will look at environments and games that are best suited to children in the exploratory and operational groups, and how they can be adapted to promote learning in a fun atmosphere. We will also see how environments and games can be adapted for children as they progress through the different groups. In addition, it is important to remember that children who are independently mobile indoors, also need powered mobility intervention to allow community mobility. This population will also be addressed, presenting research as well as specifically suited interventions. Participants will be encouraged to share their ideas and experience in an atmosphere of peer learning.

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6. Field, D. A. (2016). Power mobility: measuring participation in everyday life for children benefiting from power mobility use (Doctoral dissertation, University of British Columbia).
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E2: Do current wheelchair provision systems stifle innovation among practitioners to enable people to truly participate?

Rosemary Joan Gowran
Emma Friesen

Learning objectives:

1. To present a case study example of consumer practitioner relationships and the effect on the success of the wheelchair service provided.
2. To reflect on current practice, shares stories which enhances and inhibit the practitioner health, wellbeing and work practices
3. To consider next steps required to maintain innovation among practitioners to enable people who use wheelchairs to participate with choice and control.

Session description:

The Wheelchair Stakeholders Meeting Report set out ten key priorities towards strengthened evidence based adequately-resourced, integrated wheelchair services supported by policies, competent personnel, and a range of appropriate products (USAID 2018). To build awareness as to the importance of appropriate wheelchair provision which enables participation and supporting good practice are among these priorities. Research conducted by Cheban and Gowran (2019) reports on eighteen semi-structure interviews about people's experiences of using wheelchair and seating provision services in the Republic of Ireland, highlighting the effects the wheelchair service delivery ecological system has on their occupational wellbeing. Five key themes emerged, reflecting on the person's relationship with their wheelchair, the service and personnel. The intention of this workshop is to focus on the person's relationship with personnel, facilitating an in-depth discussion on the challenges within this relationship and its effect on promoting good practice.

Content references:

1. Cheban K, Gowran RJ. Bridge the Gap with People's Perspectives on Wheelchair Provision Paper International Seating Symposium Pittsburgh 20-22 March 2019
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4. Ripat, J., Verdonck, M. and Carter, R.J. (2017) 'The meaning ascribed to wheeled mobility devices by individuals who use wheelchairs and scooters: a metasynthesis', Disability and rehabilitation. Assistive technology, 1.
5. Smith EM, Gowran RJ, Mannan H, Donnelly B, Alvarez L, Bell D, Contepomi S, Ennion L, Hoogerwerf E-J, Howe T, Jan Y-K, Kagwiza J, Layton N, Ledgerd R, MacLachlan M, Oggero G, Pettersson C, Pousada T, Scheffler E, Wu S. Enabling appropriate personnel skill-mix for progressive realization of equitable access to assistive technology. Disabil Rehabil Assistive Technol. 2018:1-9. Available from: https://www.tandfonline.com/doi/full/10.1080/17483107.2018.1470683
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E3: Customised sporting equipment and seating: An innovative multi-discipline approach

Steven Wilson
Keren Faulkner
Matthew Crawford

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

1. Identify how different roles can work together to achieve complex equipment and seating outcomes.
2. Have a greater understanding of what customised seating approaches exist for recreation and sports users.
3. Have a greater understanding of how technology can be used to create performance gains for users.

Session description:
Seating that comes with sporting equipment (e.g. race chairs, hand cycles) is often very basic and standard for all users. Equally sports chairs and equipment can often offer limited customisation of set up for an individual's specific needs. All athletes have individual postures and body size, consequently standardised seating options and equipment only serve the partial needs of athletes. The basic seating and equipment not only has limitations for performance outcomes but also for reduction of pressure injury risk. Customised contoured seating is effective at reducing pressure ulcer risk measures (Tasker et al 2014). In addition to reduction of pressure injury risk, customised seating and equipment should also act to increase comfort and stability. These two components of comfort and stability of equipment structures were identified by recent research by Stone et al. (2019) as being the foundations for successful performance for hand cyclists in their study.

Previous projects jointly conducted by Paralympics Australia and the Australian Institute of Sport have shown that customised seating serves to stabilise the athlete into their optimal posture for performance which in turn is believed to maximise mechanical efficiency and performance. Stability of posture has potential benefits by enabling greater force generation through limitation of excess body movement and energy wastage (Arnet 2012).

Customised seating and equipment aims to improve the performance and outcomes for the athlete. This session will provide valuable insight into what customised approaches are available and their benefits and limitations. This session will also present case studies of innovative customisations made to equipment and seating for Australian athletes and highlight how a multi-discipline team using the latest technology can achieve performance gains for users.

Content references:

1. Arnet, Ursina. 2012. Handcycling: a biophysical analysis. Thesis paper.
2. Benjamin Stone, Barry S. Mason, Andrea Bundon & Victoria L. Goosey-Tolfrey (2019): Elite handcycling: a qualitative analysis of recumbent handbike configuration for optimal sports performance, Ergonomics, DOI: 10.1080/00140139.2018.1531149
3. Tasker, L.H., Shapcott, N.G., Watkins, A.J. & Holland, P.M. 2014, The effect of seat shape on the risk of pressure ulcers using discomfort and interface pressure measurements. Prosthetics Orthotics International 38 (1), 46-53.)

E4: What's going on under there? Shear force measured during powered wheelchair standing

Megan Ransley, PT
Erin Davis, OT

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

1. Describe how shear force is a contributing factor to deep tissue injury
2. For both sit to stand and supine to stand, describe the effect of standing using a powerchair on shear force at the seat plane
3. Identify the shear force risk of prolonged anterior tilt (reverse tilt) to the seated surface
4. Compare and contrast pressure force to shear force and discuss the implications for standing using a powered wheelchair

Session description:
This is a practical workshop for wheelchair prescribers. Please come ready to participate in word and possibly body (we will need a volunteer or two). Information on shear force in the seated plane and its potential contribution to deep tissue and pressure injury will be discussed as context to this workshop. A state-of-the-art standing power wheelchair with an anti-shear mechanism will have both a shear mapper and pressure mapper applied as a participant stands with the assistance of the chair. We will note the effect on both forces, which will be projected live for viewing in the workshop. We will note shear force at half way and full stand in both supine to stand and sit to stand. A discussion around the forces a standing chair can produce will be had. Implications for prescription and appropriate clients will be considered. We will consider what affect changing seating components might have and the importance of using a standing chair that is designed with anti-shear components. The ideas and insights of the participants in the workshop will contribute to the take home message. We are interested in understanding how innovative technology might impact the physiology of sitting, and since those forces can be significant, what we need to consider when prescribing these powerchairs.

Content references:

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E5: Body, Seating and Frame Measurements from Assessment to Delivery

Kelly Waugh, PT
Lois Brown, PT

Learning objectives:
Upon completion of this course, attendees will be able to:

1. Translate range of motion measurements from a mat exam into corresponding relative angles of the seated person as part of a Postural Alignment Plan
2. Be able to identify 2 absolute body segment angles that can be used as outcome measures to objectively measure a change in sitting posture.
3. Translate angular and linear dimensions of a seated person into the corresponding angular and linear dimensions of the seating support system.
4. Be able to identify and prescribe key wheelchair frame features, components and dimensions that are required to support the desired body posture and configuration of seating support system components.
5. Understand which angular and linear measurements are critical to determine at each stage of the wheelchair service delivery process.

Session description:
This course aims to improve the quality and efficiency of the wheelchair service delivery process through the accurate use and application of standardized linear and angular measures of the body, seating system and wheelchair frame. Implementation of a common vocabulary of terms and measures will reduce errors, improve outcomes, and promote consistency of practice globally. Using the structure of the wheelchair service delivery process, from assessment to delivery and follow-up, we will discuss when and why measurements are taken, and how to translate them from the body, to the seating system, and finally to the wheelchair frame. The measures to be applied include: relative and absolute body segment angles, relative seating support surface angles, relative and absolute frame angles, linear measures of the seated person, linear and placement dimensions of the seating system, and key linear frame dimensions. A focus will be on the translation of measures taken during the therapy evaluation into a preliminary postural alignment plan; the determination of a final seating and postural alignment plan after simulation and trials; and finally, how to specify the correct frame components and dimensions that will support the postural alignment plan and functional goals of the individual. The use of pre and post objective measures of seated posture will also be highlighted as a method for measuring outcomes related to sitting posture.

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acy/resources/position-papers/RESNAWheelchairServiceProvisionGuide.pdf

F1: Evaluating and implementing a web-based follow-up service for wheelchair users

Claudine Auger, OT
Aicha Taibi
Zineb Alliche
Louise Demers, OT
Nathalie Bier, OT
Sara Ahmed, PT

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

1. Describe new approach to provide systematic follow-up after wheelchair provision
2. Outline dimensions to be considered when evaluating a web-based intervention
3. Identify wheelchair interventions outcome measurement tools for users and caregivers

Session description:
Introduction: Training and follow-up of older adults and their carers after the acquisition of mobility aids is resource-intensive. MOvIT+ is a web-based program that offers a set of resources and services to address these gaps through remote monitoring, support and training for six types of mobility aids.

Objective: Evaluate the MOvIT+ intervention and monitor its implementation for wheelchair users in a Canadian community (pilot phase).

Methodology: Our interdisciplinary research team engaged key stakeholders in the following areas: rehabilitation, knowledge transfer, departmental policies and programs, assistive technology services, information technology implementation and caregiver advocacy. Three focus group discussions and six subcommittee working meetings were used to produce an an evaluation plan of the intervention based on the framework of Proctor et al. 2011.The intervention was then implemented with measures from the pre-acquisition period up to 6 months post-procurement with qualitative interviews and structured questionnaires (QUEST: Quebec User Satisfaction with Technology; WhOM: Wheelchair Outcome measure; and CATOM: Caregiver Assistive Technology Outcome Measure).

Results: Preliminary results of the MOvIT+ intervention with a sample of 40 wheelchair users will be presented with respect to outcomes on functioning and satisfaction of wheelchair users and their caregivers. We will also highlight implementation results regarding relevance, acceptability, feasibility, fidelity to the monitoring protocol as well as costs up to 6 months post-procurement. Strengths and limitations of the evaluation and implementation plan will be discussed.

Conclusion: Our experience suggests that building a holistic evaluation and implementation plan for a complex web-based intervention benefits from a balance of theory-grounded and stakeholder decisions.

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F2: Bridging the gap in wheelchair skills testing and training in a Canadian paediatric rehabilitation context

Genevieve Daoust
Paula W. Rushton
Louise Demers

Learning objectives:

1. Participants will be able to describe the evidence practice-gap in wheelchair skills testing and training in the paediatric rehabilitation context.
2. Participants will be able to describe 4 practice factors influencing Wheelchair Skills Program implementation in the paediatric rehabilitation context.
3. Participants will be able to reflect on how the knowledge translation intervention may apply to their setting with at least 2 implementation strategies.

Session description:

Background: The majority of children using a manual wheelchair remain dependent on a caregiver for daily mobility[1,2] and can be subject to injuries with wheelchair use.[3] Despite the availability and the effectiveness[4] of the Wheelchair Skills Program[5] (WSP), uptake in clinical practice is suboptimal.[6]Addressing this issue in paediatric rehabilitation could help to bridge this evidence-practice gap.

Objective**:** To develop a WSP knowledge translation (KT) intervention for the pediatric rehabilitation context.

Methods: This in-progress mixed methods study, being conducted in a pediatric rehabilitation centre, is guided by phases 1-4 of the Knowledge-to-Action framework.[7] Participants of relevant stakeholder groups were invited to complete a survey (occupational therapists [OTs]), questionnaires (wheelchair users), a focus group (OTs) and/or a qualitative interview (managers and health insurance representatives). Descriptive statistics were used for quantitative analysis. A deductive approach using the Consolidated Framework for Implementation Research[8] was used for qualitative data analysis.
Results: According to the survey results (n=36 OTs of a possible 53), 17% of the sample uses the WSP when training manual wheelchair skills to children but 0% of the sample uses the WSP when training a caregiver. Using the WSP or training methods based on clinical experience, 64% of OTs train basic skills to pediatric wheelchair users, 5.5% train community skills and 0% train advanced skills. Preliminary results from the focus groups and interviews outlined factors influencing use of the WSP, including limited time and resources, lack of knowledge about the WSP and lack of knowledge about functional outcomes related to training. Concerns regarding applicability of the WSP and the need for adaptations specific to the pediatric population were also identified

Conclusion: As a first step towards bridging the evidence-practice gap in wheelchair skills testing and training, findings from this study will be used to develop a tailored, pediatric-specific KT intervention.

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F3: Collaboration towards improving the client journey: Health care resources, the highlights and final outcome

Sandra Malkin
Sathish Manogaran
Colleen O'Brien-Malone
Jane Sander

Learning objectives:

1. To share the client experience of transitioning through multiple health care services.
2. To understand the importance of collaboration amongst multiple disciplines and health care providers to achieve the best outcome for the client
3. To understand that custom made designs at limited cost can be utilized when commercial products are unavailable or unsuitable to client needs

Session description:

A qualitative case study is presented outlining Gordy's journey through multiple health care facilities following wheelchair dependence secondary to C3 Tetraplegia secondary to Neurofibromatosis Type 1 with ventilator dependence. Through collaboration of multiple health care professionals, suitable seating systems, independent wheeled mobility and digital communication access has been achieved. Significant risk of harm from falls, pressure injury, and further loss of function was minimised through carefully managed strategies whilst promoting positive mental health.

Limited funding and resources were available in the acute setting for safe and supported seating out of bed. There were also staffing concerns related to OSH and manual handling, and Gordy's poor quality of life in the ICU setting. Effective collaboration between health care providers resulted in Gordy being able to participate in rehabilitation from moment of transition to the tertiary hospital.

Gordy is now being supported via alternate programs (NDIS and VDQ programs), demonstrating how these service are working collaboratively to achieve the client's goal of community living.

Roles of varying health professionals (Nurses, Occupational Therapists, Physiotherapists, Rehabilitation Engineers, Speech Pathologists, Technical Officers) involved in Gordy's journey will be discussed in relation to the challenges encountered regarding his health care issues, funding and policies between different service providers, and how jointly those involved overcame these with innovative problem solving and collective planning. Photographic demonstration of this complex journey will be presented in addition to hearing from Gordy himself regarding his feelings related to this journey of over 2 years.

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F4: What is Remote? Living with a Spinal Cord Injury in the Northern Territory and the Delivery of Wheelchair and Seating Services

Andrew Congdon

Learning objectives:
This presentation will:

1. Define different levels of remoteness and how they apply to NT towns and communities
2. Report the demographics of people living with a SCI in remote settings in the NT
3. Provide an example of wheelchair and seating services being delivered in the NT

Session description:
The Northern Territory (NT) has the smallest population (245,000) of any state or territory in Australia, and outside of Darwin (population 137,000) the population is found in remote towns and communities spread throughout its vast 1,400,000 square kilometre land mass. The NT Government has been primarily responsible for the delivery of wheelchair and seating services, and especially for those with more complex needs in remote settings. Remote service delivery can present many challenges due to distance, climate, environment, culture and language, and general access to services. Following a recent audit of the demographics of people living with a Spinal Cord Injury (SCI) in the NT and reflecting on over 10 years of delivering services in the NT this presentation will.

Content references:

1. What is Remote? An analysis of spinal cord injury in the Northern Territory. 2018. Congdon, A. James, E. Marshall, Dr R.
2. Modified Monash Model. 2015. Department of Health, Australian Government Health Services District Map. 2016. PHN Northern Territory

F5: Innovate to Participate: Beyond Body Structures and Function (Using sit-to-stand power wheelchairs to increase activity and participation)

Kim Magnus, OT
Lynore McLean, PT

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

1. State clinical and research evidence in support of standing for children with physical & developmental disabilities.
2. Identify 3 or more ways to support a shift in rationale for standing prescription to emphasis benefits related to Activity and Participation with Body Structure and Function as "side benefits"
3. Name 3 outcome measures for evaluating change in Activity & Participation to support changes in funding paradigms

Session description:
Standing frames are commonly prescribed for children and youth with physical and developmental disabilities. Standing programs often focus on Body Structure and Function outcomes [1,2,3]. The research evidence supporting these outcomes is limited.
The literature supporting standing frame prescription and implementation often references positive impacts in social interaction [4,5], education [4,5], self-esteem [5], community integration [5] and play [6]. Some researchers have explored the barriers to standing frame programs, including manual transfers [6], lack of space [6], and limiting independent mobility [6].

Based on our clinical experience, we have found that by integrating standing and independent mobility, the benefits for children and families go beyond Body Structure and Function.

We believe there is a need for a fundamental shift in funding priorities to support children as active participants in their daily lives. This is a right upheld in the Convention on the rights of Persons with Disability: "States Parties shall take effective and appropriate measures,…, to enable persons with disabilities to attain and maintain maximum independence, full physical, mental, social and vocational ability, and full inclusion and participation in all aspects of life." [Article 26.1]
While integration of standing into a daily routine can be achieved through a sit-to-stand power wheelchair, government funding bodies in our jurisdiction (B.C., Canada) are reluctant to support the purchase and upkeep of sit-to-stand power wheelchairs. Decisions are based on "medical necessity".
The presenters will draw on clinical experience through case studies to explore the use of sit-to-stand power wheelchairs in children and youth with a variety of disabilities. These will highlight:

- Activity and participation benefits
- Challenges in set up for children
- Impact of user & caregiver capability on use
- Potential challenges in customization of seating
- Caregiver training and education regarding integration into daily routine
- Potential outcome measures for evaluation

Content references:

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systematic review protocol. JBI Database of Systematic Reviews and Implementation Reports,12(7), 101-118.
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F6: Move it, Move it, Move It – You've Got To Move It! Dynamic Position Change Throughout the Day to Improve Health, Inclusion and Happiness

Amy Bjornson. OT

Learning objectives:

1. Participant will understand key power seat functions that are available on power wheelchairs
2. Participant will be able to relate client needs to the clinical implications of the power seat functions
3. Participant will be able to list 3 strategies to improve compliance with usage of power seat functions

Session description:

We know that unrelieved pressure upon weight-bearing tissues can produce lesions and the prevalence is high among wheelchair users. We also know that position change is integral to the health of the cardiovascular system, respiratory system and has positive effects on the neurologic system.

This session will discuss the latest research surrounding dynamic seating systems available on power wheelchairs – what can be achieved with anterior tilt, lateral tilt, standing features and seat elevate. We'll address, via case study, how dynamic seat functions can move the user into different positions throughout the day to allow increased functionality, health and comfort. We will also review assessment strategies, funding considerations and clinical implications. We'll review cases - What strategies are clients actually using? What strategies are they not using, and why? How can therapists influence behaviour to increase position change throughout the day? Can new technology influence behaviour and usage of power seat functions? Which systems should you be recommending for your clients?

Clinicians must emphasize the importance and reasons for the use of power seat functions to improve clinical outcomes. This session will discuss the latest research surrounding dynamic positioning and technology that can provide it. We'll discuss considerations during assessment and prescription as well as feedback technology developed to enhance usage of these technologies.

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2. Giesbrecht, E., Ethans, K., & Staley, D. (2011). Measuring the effect of incremental angles of wheelchair tilt on interface pressure among individuals with spinal cord injury. Spinal cord, 49(7), 827-831.
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G1: Tipping the Balance – evaluating centre of gravity to optimise propulsion and stability

Bill Contoyannis
Jesus Campo Uribe
Catherine Young
Dale Robinson
Kim Vien
Angela Rowe

Learning objectives:

1. Define the centre of gravity of the manual wheelchair and its user and its impact on self-propulsion and stability.
2. Explain the position of the centre of gravity and how to measure it for manual wheelchair users.
3. Describe the relationship of manual wheelchair and seating adjustments to propulsion and stability, and therefore the user's function and participation.

Session description:

The centre of gravity acts as a "balance point" which not only affects the safety of the wheelchair but also the propulsion efficiency. Do you know your client's ideal centre of gravity set up? Do you know how the centre of gravity of your client's manual wheelchair affects their daily function?

This 60 minute workshop will be run jointly by a Rehabilitation Engineer and Seating Clinicians. The Rehabilitation Engineer will define centre of gravity and outline the research and assessment tools used in its accurate measurement. As we work through adjustments for posture, pressure and function, the measurement and monitoring of the centre of gravity is critical. This includes when setting up trial wheelchairs in order to compare like for like in relation to the centre of gravity. Does one wheelchair feel easier to propel because it is lighter/has different specifications or because the centre of gravity is set up differently? Participants will have the opportunity to observe variations in centre of gravity and their practical implications which can be significant.

A *User Friendly Clinical Chart* will be circulated which reflects the impact of seating adjustments on safety and self-propulsion. This chart has been developed from the Assessment tools used in the research and will be further explained during the session.

In the workshop, Seating clinicians will describe clinical cases and how they are applying centre of gravity measurements in their practice at the Wheelchair and Seating Clinic at The Royal Melbourne Hospital. Simple wheelchair changes such as trialling an alternative cushion or backrest can have significant impact on the client's stability and propulsion. We will present and practically demonstrate several clinical scenarios when seating changes affected the safety and propulsion efficiency of the manual wheelchair user.

Content references:

1. Campo Uribe JA. Identification and Visualisation of the Centre of Gravity of a Wheelchair User [Biomedical Engineering Capstone Project]. Melbourne, Vic: The University of Melbourne; 2018.
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G2: A Sustainable Spinal Seating Professional Development Program In NSW, Australia – The Outcomes & Challenges

Charisse Turnbull, OT

Learning objectives:

1. To describe the need of professional development in prescribing seating and wheeled mobility for clients with a spinal cord injury in NSW
2. To demonstrate the open access Spinal Seating Education Website which is funded by the Agency for Clinical Innovation (ACI)
3. To discuss the outcomes and future challenges of the professional development program

Session description:

In NSW, seating and wheeled mobility are predominantly prescribed through the client's hospital ward therapist or community local health services. There is no competency pathway for clinicians to be an accredited prescriber. Many clinicians have limited knowledge and experience in prescribing seating and wheeled mobility equipment for clients with a spinal cord injury. The short and long term consequences of an incorrectly prescribed seating can be profound, e.g. pressure injuries, postural deformities and pain; as are the safety issues associated with wheelchair use.

This presentation hopes to raise awareness of the free and newly revised 2017 Spinal Seating Education Website funded by the ACI State Spinal Cord Injury Service. As a component of the Spinal Seating Professional Development Program developed in 2008, the seating education modules aim to:

- Provide accessible clinical knowledge for seating and wheeled mobility assessment and intervention to clinicians
- Encourage clinicians to adopt a structured, client-focused and goal-orientated approach to clinical practice through a process of systematic assessment and documentation of seating outcomes
- Improve clinical reasoning to select appropriate seating and wheeled mobility solutions using key seating intervention principles
- Prepare workshop participants to maximise hands-on learning opportunities during the seating workshops which were provided through Assistive Technology and Seating

The Spinal Seating Education Website features:

- 10 learning modules
- Downloads of sample assessment forms and prompt sheets.
- 5 teaching videos
- Downloads of handy hints, selected useful resource and practical ideas
- Self-assessment quizzes or case studies with answers

(A walk through of the live website demonstration to navigate the Spinal Seating Education Website modules is part of the paper presentation. https://www.aci.health.nsw.gov.au/networks/spinal-cord-injury/spinal-seating)

The paper will conclude with the evaluation of the education website and seating workshops, and discussion of future challenges of the professional development program in relation to the National Disability Insurance Scheme.

Content references:

1. Canadian Best Practice Guidelines for the Prevention and Management of Pressure Injuries in People with Spinal Cord Injury- A Resource Handbook for Clinicians; Houghton PE, Campbell KE and CPG Panel (2013). ISBN 978-0-9919094-0-7.
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G3: Unlocking Potential: Providing Power Mobility Training for Children with Multiple, Severe Disabilities

Lisa K. Kenyon, PT, DPT, PhD, PCS
John P. Farris, PhD

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

1. Discuss 3 potential benefits of using power mobility training interventions with children and adolescents who have multiple, severe disabilities.
2. Describe 5 steps to creating power mobility training programs to meet the individual needs of children and adolescents who have multiple, severe disabilities.
3. Discuss 3 means by which to evaluate outcomes and expectations for the use of power mobility interventions in this unique population.

Session description:
Children with severe motor, cognitive, and communication deficits are limited in their ability to use self-initiated movement to explore and learn from the world around them. Such children are frequently dismissed as “too involved” or “too low functioning” to use power mobility, yet research indicates power mobility may be beneficial for children with mobility limitations. This session will provide details related to the interventions used in our power mobility training program for children who have multiple, severe disabilities (ages 9 months to 26 years). The potential benefits of power mobility training in this population will be examined and explored. Various intervention techniques focused on creating an engaging environment customized to target the emergence of basic power mobility skills through environmental exploration and play will be presented and discussed. Outcomes and expectations for the use of power mobility interventions in this unique population will be considered and reviewed. Findings of our recent encephalography (EEG) research studies will be used to highlight potential neuroplastic outcomes. Video case studies and examples from our program will be used to illustrate key concepts.

Content references:

1. Kenyon LK, Farris J, Brockway K, Hannum N, Proctor K. Promoting self-exploration and function through an individualized power mobility training program. *Pediatr Phys Ther*. 2015;27(2):200-206.
2. Kenyon LK, Farris JP, Gallagher C, Hammond L, Webster LM, Aldrich NJ. Power mobility training for young children with multiple, severe impairments: a case series. *Phys Occup Ther Pediatr*. 2017;37:19-34.
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P6: Clinical Use of Custom Contoured Seating Systems for Adolescents with Postural Deformities: A Case Study

Justine Harrigan,
Geneviève Daoust

Learning objectives:

1. Participants will describe 3 characteristics that influence the clinical decision-making process for contoured seating systems in a pediatric setting.
2. Participants will compare and contrast two custom contoured seating systems in a specialized school setting.
3. Participants will reflect on how the use of custom contoured seating can be integrated in their respective settings.

Session description:

Background: For clients with severe postural deformities, custom molded seating systems function as optimal solutions for support and comfort.1,2 However, for the paediatric population in Quebec (Canada), custom contoured seating (CCS) is more frequently employed. The reason for its popularity is because it allows for modifications which accompany a child's growth. While CCS offers many options, it can be costly and requires considerable adjustment time. Nevertheless, documenting the use of CCS in patient outcomes and clinical implications can help the decision-making process.
Objective: To compare functional outcomes, pressure distribution and clinical efficiency in two different CCS systems using clinical case studies: 1-a tension adjustable back with laterals; 2-a planar style back with contouring foam shapes and laterals.
Methods: Two adolescents with fixed postural deformities will be invited for a month's trial of a planar style back with contouring foam shapes. These subjects already benefit from tension adjustable backs with laterals (i.e. standard intervention). Outcome measures include the Family Impact of Assistive Technology Scale for Adaptive Seating (FIATS-AS)3, pressure mapping imagery and a questionnaire addressing delivery and adjustment time as well as ease of use by school staff. The outcome measures will be completed twice for each case: twice with the tension adjustable back and twice with the planar back.
Anticipated results: Outcome measures will provide information with regards to overall benefits and disadvantages for each CCS system from the user's and the technical team's perspectives. This can be a first step in improving the decision-making process in complex pediatric positioning.
Clinical Implications: Through clinical case studies, this project intends to document and share the outcomes of two types of CCS in adolescents with complex postural needs. It will also allow an exchange between clinicians concerning possible solutions when addressing complex positioning cases in paediatrics.

Content references:

1. Furumasu J. (2018). Considerations when working with the pediatric population. In L. Lange, M., L. Minkel, J. (dir) Seating and Wheeled Mobility, a clinical Resource Guide (p.3-26). Thorofare, États-Unis : SLACK Incorporated.
2. Chung, J., Evans, J., Lee, C., Lee, J., Rabbani, Y., Roxborough, L., & Harris, S. R. (2008). Effectiveness of adaptive seating on sitting posture and postural control in children with cerebral palsy. Pediatric Physical Therapy, 20(4), 303-317.
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P7: Collaborating to Provide a Seating Solution: When done well the results can be life changing!

Kat Wyeth

Learning objectives:

1. To demonstrate that using components from more than one equipment supplier can give a more tailored solution.
2. To show that sometimes an elongated trial process is necessary to obtain the best solution.
3. To illustrate that a good seating solution can not only improve posture, function and manage skin integrity but can have positive effects on a client's mental well-being, respiratory, bladder and bowel function and ability to participate within the family and wider community through increased sitting tolerance.

Session description:

A poster showing in photographs the before and after seating setups for a 39 year old C4 tetraplegic (AIS – A) male. It will have some background information of his pain levels, sitting tolerance and function in his old setup and the comparative information for the new setup. It will include some information regarding working with multiple companies over an extended trial period to obtain the best solution possible. It will note the positive effect the new seating solution had on the client's body functions that initially we had not been looking to address. These were a great bonus for the client. It will include statements quoted from the client highlighting how the new solution has changed his day to day quality of life and ability to participate more in family life and within his community, from the therapist noting the ease at which the collaborative process occurred, the equipment company providers views on collaboration and putting the client in the centre of the solution.

Content references:

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2. Off Loading wheelchair cushion provides best case reduction in tissue deformation as indicated by MRI. By Evan Call, MS, CSM, Thomas Hetzel, PT, ATP, Chad McLean, Joshua.N Burton, Craig Oberg PhD. Journal of Tissue Viability, Vol 26, Issue 3, Aug 2017, Pgs 172-179.
3. Distinct tilting behaviours with power tilt-in-space systems by Sharon Eve Sonenblum and Stephen Sprigle. Journal Disability and Rehabilitation: Assistive Technology. Vol 6, 2011 – Issue 6, Pgs 626-535.

P8: Considerations for Mobility Post Bilateral Posterior Deltoid to Triceps Tendon Transfer (Troids) Surgery in Tetraplegia

Katie Strachan
Dr. Cynthia Bennett

Learning objectives:

1. To provide awareness of the posterior deltoid to triceps tendon transfer surgery currently available for people with spinal cord injury
2. To gain knowledge on the implications of posterior deltoid to triceps tendon transfer surgery on mobility
3. To gain an understanding of patient's experiences with mobility post posterior deltoid to triceps tendon transfer surgery

Session description:

Introduction:
Since September 2015 Counties Manukau Health has provided a comprehensive, multidisciplinary service for reconstruction and rehabilitation of the tetraplegic upper limb. To date, four patients have undergone TROIDS in order to improve upper limb function and quality of life. Significant functional loss due to deconditioning and diminished mobilisation are associated with surgical restrictions imposed over the first six weeks post-surgery. Restrictions include:

- Initial ten days of bed rest;
- maintenance of abducted arm position (30°);
- positioning of bilateral upper limbs in dynamic extension braces.

Significant deconditioning is apparent when patients resume manual wheelchair propulsion at six weeks.

The aim is to improve conditioning and mobility options in the first six weeks allowing a smoother transition into manual wheelchair propulsion.

Method:
TROID patient experience was explored through the narrative of several patients' journeys. Clinician experiences were gathered through survey and discussion to establish if these challenges were consistent across other spinal units undertaking bilateral TROIDs surgery and if protocols post-operatively were similar. Literature review was undertaken to explore wheeled mobility options and conditioning programmes.

Results:
Completed analysis of patient and clinician experience data will be presented with best-practice options for mobility and conditioning, compiled from international research and international SCI services performing TROIDs surgery.

Conclusion:
Experience data and information gathered will aid further considerations for mobility and conditioning options to improve functional outcomes and quality of life for people post TROIDs surgery. Our long term aim is to achieve a best practice, co-designed upper limb surgical service for people with tetraplegia.

Content references:

1. Koch-Borner, S., Dunn, J., Friden, J., Wangdell, J. (2016) Rehabilitation after posterior deltoid to triceps transfer in tetraplegia. Archives of Physical Medicine and Rehabilitation, 97(6 Suppl 2):S126-35
2. Hentz, V., Brown, M., & Keoshian, L. (1983). Upper limb reconstruction in quadriplegia. Functional assessment and proposed treatment modification. Journal of Hand Surgery, 8:119-31.
3. Jeong, JH, Park, JB, Ahn, DH, Kim, YR, Hong, MJ, Lee, YJ, Park, CI & Heo, YM. (2016). Posterior Deltoid-to-Triceps Tendon Transfer for Elbow Extension in a Tetraplegia Patient: A Case Report. Annals of rehabilitation medicine, 40(2), 351-355. doi:10.5535/arm.2016.40.2.351

P9: Partnership with Rural Health Services via the use of Photogrammetry for Customised Postural Supports

Jane Sander
Richard Sutton

Learning objectives:
Upon review of the poster presentation the reader will be able to:

1. Understand the process of photogrammetry used with the specific case study represented
2. Understand the application and benefits of Telehealth services for clients and therapists living in remote and rural locations
3. Recognise the importance of supporting and involving local health service providers in partnership with tertiary institutions providing specialty services

Session description:
Providing effective healthcare for the vast state of Western Australia presents various challenges, one of which is overcoming immense logistical issues and ever tightening financial constraints to provide complex services to regional and remote areas.

In place of the cost of a day's travel and overnight stay for two staff for the provision of a 30 minute clinic, the Rehabilitation Engineering Clinic (REC) in Perth, sent a lightweight package containing largely disposable items to a regional care facility, 400km from the nearest major hospital. These contents were used to take a 3D scan of a client's lower legs to assist in fabrication of a customised lower leg support.

Through telehealth link, using an iPad, local Occupational Therapist and support staff were able to complete the scanning procedure. Data was transferred back to the REC where staff processed the imagery using CAD CAM software and machinery). The Computer Aided Machine then carved a customised support cushion matching the client's profile, maximising the contact area.

Prior to manufacturing the custom support, the client's lower limbs were supported by an array of pillows, foam, towels, and blankets. Assembly of this support system was carried out several times daily by the local nursing staff, using up valuable time achieving inconsistent results.

Via the processes of photogrammetry and Telehealth technology, therapists working within remote areas of Western Australia were able to work collaboratively with specialised clinicians and technicians to construct a custom support, designed and manufactured to suit the client. While the aim was to improve client comfort and reduce potential pressure injury, an added benefit was in reduced laundry loads and time burden for nursing staff.

Scans and associated files are electronically filed with client's records. Replacement support surfaces can be quickly reproduced cost effectively if the original became lost, damaged, or excessively soiled.

Content references:

1. Humphreys,J S, . "Key Considerations in Delivering Appropriate and Accessible Health Care for Rural and Remote Populations: Discussant Overview." Australian Journal of Rural Health 17.1 (2009): 34-38.
2. Lemaire, E., Upton, D. , Paialunga,J., Martel,G. & Boucher, J. "Clinical Analysis of a CAD/CAM System for Custom Seating: A Comparison with Hand-sculpting Methods." Journal of Rehabilitation Research and Development 33.3 (1996): 311-20.
3. Papali, A. "Providing Health Care in Rural and Remote Areas: Lessons from the International Space Station." Bulletin of the World Health Organization 94.1 (2016): 73-4.
4. Schein, S., Holm, S., & Brienza. "Telerehabilitation Wheeled Mobility and Seating Assessments Compared With In Person." Archives of Physical Medicine and Rehabilitation 91.6 (2010): 874-78.

ABSTRACTS
THURSDAY 14th NOVEMBER

H1: Experience of dynamic splinting as an adjunct to equipment for positioning and function; case studies

Helen Thorne, PT

Learning objectives:

1. Understand the impact of dynamic splinting on seating and positioning
2. Explore effective collaboration with different providers/services
3. Recognise the positives as well as the challenges in consideration of dynamic splinting

Session description:
This session will use case studies to explore the impact of dynamic splinting on existing and future postural and positioning supports; as well as the child/young person's functional changes. The positives, negatives, successes, and failures, of dynamic splinting assessment and provision will be discussed.

The successful running of a dynamic splinting (Second Skin) clinic, jointly run by CDS and Orthotics South Island will be presented, including referrals, criteria, assessment, goal setting, and outcomes. The clinic has been running twice a year since August 2016, with 103 joint assessments being completed. A range of different splints have been provided depending on need and goals set.

The cases will highlight the collaboration and partnership between the child, family/caregivers, therapists (from different sectors), orthotists, and Second Skin for optimum outcomes.

Content references:

1. Coghill JE, Simkiss DE (2010) Do Lycra garments improve function and movement in children with cerebral palsy? Arch Dis Child. 95(5):393-5.
2. Knox V (2003) The use of lycra garments in children with cerebral palsy: a report of a descriptive clinical trial British Journal of Occupational Therapy 66 (2): 71-77
3. Romeo DM, et al (2018) Effect of Lycra suits in children with cerebral palsy European Journal of Paediatric Neurology 22: 831-836
4. Uhegwu E and Bhugra R (2018) Lycra garments for neurological and musculoskeletal conditions NHS Northern Treatment advisory Group

H2: Literature Review: Effect of Dynamic Splints on scoliosis management and QoL in a neuromuscular population

Samantha Walsh, PT
Lisa Hannan, OT

Learning objectives:

1. From the current literature available determine the impact of Dynamic Splints/ Orthoses on patient Quality of Life in a neuromuscular population
2. From the current literature available determine the impact of Dynamic Splints/ Orthoses on neuromuscular scoliosis management
3. Establish key prospective research required in the area of Dynamic Splints/ Orthosis in neuromuscular scoliosis management

Session description:

The use of dynamic splints/ orthosis are becoming increasingly prevalent in the management of neuromuscular scoliosis however the literature in this area is lacking. The aim of this review is to investigate the current literature to determine the effectiveness of dynamic splint/ orthosis use in the management of neuromuscular scoliosis and its overall impact of quality of life (QoL).

Methods

A comprehensive search of the following databases was conducted; MEDLINE, SCOPUS, AND EMBASE. The search terms used were extensive, yet specific. Selection criteria were applied through screening abstract and title, followed by the analysis of the full body of text. Data was then critically appraised by two independent reviewers.

Results

Four studies were included in this literature review. Comparative analysis revealed an overall improvement in sitting balance, decreased need for support in sitting, an increase in carer satisfaction, an increase in compliance and an initial reduction in Cobb angle.

Limitations

Small sample sizes and short follow up periods.

Conclusion

Currently there is low quality evidence to support the use of dynamic splints/ orthoses in a neuromuscular population. Whilst common trends are in favour of using dynamic splints/ orthoses, due to small sample sizes, significant findings are often lacking. However, anecdotally positive outcomes are often seen in comfort, compliance, sitting balance, upper limb use, and respiratory and digestive function. The current literature places an emphasis on idiopathic scoliosis management, likely because this group is far easier to standardise for research purposes. Future research is needed to establish best practice guidelines for dynamic splint/ orthosis application and its overall effectiveness in neuromuscular scoliosis management and its impact on QoL. Until this point, case studies should be looked to as the 'gold standard' for clinical practice guidelines and evidence supporting orthoses in idiopathic scoliosis management should be extrapolated to a neuromuscular population.

Content references:

1. Blomkvist, A., Olsson, K., & Eek, M. (2018). The effect of spinal bracing on sitting function in children with neuromuscular scoliosis. Prosthetics and Orthotics International. 42. 030936461877406. 10.1177/0309364618774063.
2. Desai, v., Gadgil, N., Saad, S., Raskin, J., & Lam, S. (2018). Measures of Health-Related Quality of Life Outcomes in Pediatric Neurosurgery: Literature Review. World Neurosurgery. 122. 10.1016/j.wneu.2018.10.194.
3. Hsu, P.C., Feng, C.K., Huang, S.H., Chiu, J.W., Chou, C.L., & Yang, T.F. (2019). Health-related quality of life in children and adolescent with different types of scoliosis: A cross-sectional study. Journal of Chinese Medicine Assoication, 82(2):161-165.
4. Kajiura, I., Kawabata, H., Okawa, A., Minobe, Y., Yoshida, K., & Suzuki, T. (2018). Concept and treatment outcomes of dynamic spinal brace for scoliosis in cerebral palsy. Journal of Pediatric Orthopaedics B, DOI: 1. 10.1097/BPB.0000000000000580.

5. Laurnen, E.L., Tupper, J.W., & Mullen, M.P. (1983). The Boston brace in thoracic scoliosis. A preliminary report. Spine, 8: 388–395.
6. Letts, M., Rathbone, D., Yamashita, T., Nichol, B., & Keeler, A. (1992). Soft Boston orthosis in management of neuromuscular scoliosis: a preliminary report. Journal of Pediatric Orthopaedics, 12: 470–474
7. Miller, A., Temple, T., & Miller, F. (1996). Impact of orthoses on the rate of scoliosis progression in children with cerebral palsy. Journal of Pediatric Orthopaedics, 16: 332–335.
8. Nakamurra, N., Uesugib, M., Unabac, Y., Machidaa, J., Okuzumia, S., & Saitoc, T. (2014). Use of dynamic spinal brace in the management of neuromuscular scoliosis: a preliminary report, Journal of Pediatric Orthopaedics B, 23: 291-298.
9. Rigo, M., Reiter, C., & Weiss, H.R. (2003). Effect of sonsrvative management on the prevalence of surgery in patients with adolescent idiopathic scoliosis. Pediatric Rehabilitation, 6: 209-214
10. Weiss, H., & Werkmann, M. (2012). Soft braces in the treatment of Adolescent Idiopathic Scoliosis (AIS) – Review of the literature and description of a new approach. Scoliosis. 7: 11

H3: Measuring total shear forces to quantify the wheelchair setup

Max Rogmans

Learning objectives:

1. The participant will be able to define and recognize the clinical importance of Total Shear Force
2. Be able to record and interpret the results of the total shear force readings for wheelchair and seating system configurations.
3. List at least 4 wheelchair adjustments which will decrease and increase the total shear force
4. List at least 4 seating system adjustments which will decrease and increase the total shear force

Session description:

Pressure injuries are a result of pressure in combination with shear forces. Pressure can be mapped, local shear force measurement is still a problem. Therefore, we've started developing the Total Shear Measurement Device or, iShear in 2010. Total Shear Force (TSF) is the shear force parallel on the seat plane, created by using a backsupport or having a certain seating angle. In literature it is often presumed that shear force is more damaging than pressure.

The iShear can be used on almost every wheelchair by placing it underneath the cushion of the wheelchair-user. It measures the TSF of the cushion on the body. In combination with pressure mapping (by placing the pressure map on the cushion human body interface) you can measure the impact of a certain posture on TSF. With the iShear you can also measure the ability of a seating system to reduce TSF by translating shear force into normal force. Hereby it's a valuable tool which helps you adapt the wheelchair set-up to reduce the TSF. The TSMD can also be used as an educational tool to show the result of certain postures on TSF.

Preliminary research shows that:

- The TSF increases with time.
- The TSF increases with sliding.
- By using the iShear the wheelchair can be adjusted to be in a more TSF neutral position.
- There is a clear correlation between pelvic tilt and TSF.

We will show how to install and use the iShear. We will show which wheelchair adaptations are of influence to reduce TSF.

Content references:

1. Aissaoui, R., Lacoste, M., & Dansereau, J. (2001). Analysis of sliding and pressure during a repositioning of persons in a simulator chair. IEEE Transactions on Neural Systems & Rehabilitation Engineering, Vol. 9, No. 2, pp. 215-224.
2. Kobara, K. et al. (2014). Effect of rotational axis position of wheelchair back support on sear force when reclining. J. Phys. Ther. Sci. 26: 701-706,2014
3. Kobara, K., Shinkoda, K., Watanabe, S., et al. (2011). Investigation of validity of model for estimating shear force applied to buttocks in elderly people with kyphosis while sitting comfortably on a chair. Disabil Rehabil Assist Technol; 6: 299–304.
4. Sprigle, S., & De l'aune, W. (2013). Factors contributing to extended activity times during the provision of wheeled mobility devices. Disability and Rehabilitation: Assistive Technology, 8(3), 225-231.
5. Waugh, K., Crane, B., Saftler Savage, F., Davis, K., Johnson Taylor, S., Cwiertnia, S., Brown, L., & Christie, S. (2013). Glossary of Wheelchair Terms and Definitions. University of Colorado/Assistive Technology Partners
6. B.C. & K.W. (2013). Guide to Seating measures. Retrieved from https:/www.assistivetechnologypartners.org

H4: Ready to Roll: Wheelchair skills training in preparation for clinical practice

Paula W Rushton
Ed Giesbrecht

Learning objectives:

1. Participants will be able to describe the differences between 'traditional' pedagogic strategies and a 'flipped classroom' approach.
2. Participants will be able to describe the differences between distributed-practice and condensed-practice approaches to providing education.
3. Participants will be able to describe how various educational approaches may be incorporated into a knowledge translation plan.

Session description:

This workshop will synthesize findings from published studies related to preparing rehabilitation students for wheelchair skills evaluation and training in clinical practice. A variety of pedagogic strategies and approaches used within entry-to-practice university programs will be discussed. Despite aspirations to promote proficiency in both clinical knowledge and skill, time constraints often limit the extent of content and practice offered in university curricula.[1] More recently, hybrid learning approaches have integrated online modules specific to wheelchair skills testing and training.[2] The presenters will contrast this a 'flipped classroom' strategy with the 'traditional' lecture and lab approach. Participatory workshops have also been used effectively to enhance students' ability to perform and teach wheelchair skills.[3] An overview of various condensed skills 'boot-camps' will be provided, including a continuing education and knowledge translation approach targeting practicing clinicians, as well as an optional rehabilitation professional university course where wheelchair skills education is distributed throughout. Providing wheelchair skills education to rehabilitation students using both condensed-practice and distributed-practice approaches demonstrates acquisition and retention of wheelchair skill, wheelchair confidence and self-efficacy to test, train, spot and document wheelchair skills.[4] The presenters will review differences between these two approaches in terms of schedule (i.e., distributed vs. condensed practice), dose of training (i.e., number of hours) and content of training (i.e., use of vignettes vs. traditional boot-camp material). Considerations for the use of these approaches will be described based on student and educator perspectives. University educators in Canada are exploring opportunities to share evidence-based content and pedagogical strategies at a national level through the development of a community of practice. The presenters will report on progress of this initiative and invite discussion about potential opportunities for international collaboration. In addition to interactive discussion points for each topic, the workshop will conclude with an open forum to for participants to share their experiences, innovative ideas, and collaborative opportunities.

Content references:

1. Fung K, Miller T, Rushton PW, Goldberg M, Toro MT, Seymour N, Pearlman J, The International Society of Wheelchair Professionals. Integration of wheelchair service provision education: Current situation, facilitators and barriers for academic rehabilitation programs worldwide. *Disability and Rehabilitation: Assistive Technology*. In press. Doi: 10.1080/17483107.2019.1594408/
2. Burrola-Mendez Y, Goldberg M, Gartz R, Pearlman J. (2018). Development of a hybrid course on wheelchair service provision for clinicians in international contexts. *PLoS ONE*, 13: e0199241.
3. Giesbrecht E, Wilson N, Schneider A, Bains D, Hall J, Miller WC. (2015). Preliminary evidence to support a 'boot camp' approach to wheelchair skills training for clinicians. *Archives of Physical Medicine and Rehabilitation*, 96, 1158-1161.
4. Rushton PW, Daoust G. (2018). Wheelchair skills training for occupational therapy students: comparison of university-course versus "boot-camp" approaches. *Disability and Rehabilitation: Assistive Technology*, 11, 1-7. Doi: 10.1080/17483107.2018.1486468.

H5: Identification, prevention and measurement of postural asymmetry

Carlee Holmes
Denise Luscombe

Learning objectives:
Upon completion of this session participants will be able to:

1. Identify typical patterns of body shape distortion
2. Understand the Goldsmith Indices of Body Symmetry in measurement to aid in 24 hour postural management
3. Synthesise the theory and evidence underpinning interventions for preventing body shape distortion

Session description:
Adults with cerebral palsy (CP) who are wheelchair dependent (Gross Motor Function Classification System, GMFCS, Level IV or V) are particularly vulnerable to spinal, pelvic and hip postural asymmetry arising from neuromuscular dysfunction. Unsupported static postures overnight contribute to body shape distortion with secondary complications including pain, pressure injury risk, contracture, poor sleep quality and increased carer burden impacting on quality of life. Understanding the influence of gravity and sleeping position on a person's potential body shape distortion is an important aspect in the prevention and remediation of postural asymmetry. There is a lack of robust evidence underpinning sleep positioning in the prevention of secondary complication yet the National Institute for Health and Care Excellence (NICE) guidelines and The Confidential Inquiry into Premature Deaths of People with Learning Disabilities (CIPOLD) are recognising the role of postural care in the prevention of secondary complications including premature death. Objective clinical measurement of posture is essential for ongoing monitoring and treatment planning. Regular radio- graphs to monitor skeletal changes in this population are challenging to implement due to cognition and / or an inability to achieve a standardised supine position thus making ongoing surveillance problematic. This can be achieved through the use of the Goldsmith Indices of Body Symmetry (GIofBS). The GIofBS takes an impairment focus to the measurement of postural asymmetry providing a Windsweeping Index (hip and pelvic symmetry), chest right/left ratio (thoracic symmetry), a chest depth/width ratio (thoracic shape) and hip external rotation / abduction calculation. Interventions for managing sleep posture will be discussed for common postural asymmetries of windswept hips, scoliosis, pelvic obliquity and limb contracture including the use of commercially available and custom products. Case studies utilising the GIofBS for measurement and sleep posture intervention strategies will be presented.

Content references:

1. Agustsson, A., Sveinsson, T., & Rodby-Bousquet, E. (2017). The effect of asymmetrical limited hip flexion on seating posture, scoliosis and windswept hip distortion. Res Dev Disabil, 71, 18-23. doi:10.1016/j.ridd.2017.09.019
2. Goldsmith, E., Golding, R. M., Garstang, R. A., & MacRae, A. W. (1992). A Technique to Measure Windswept Deformity. Physiotherapy, 78(4), 235-242. doi:https://doi.org/10.1016/S0031-9406(10)61432-0
3. Goldsmith, E., & Goldsmith, J. (2013). Goldsmith Indices of Body Symmetry (3rd ed.). www.simplestuffworks.co.uk: www.simplestuffworks.co.uk.
4. Holmes, C., Brock, K., & Morgan, P. (2018). Postural asymmetry in non-ambulant adults with cerebral palsy: a scoping review. Disability and Rehabilitation, 1-10. doi:10.1080/09638288.2017.1422037
5. Rodby-Bousquet, E., Agustsson, A., Jonsdottir, G., Czuba, T., Johansson, A. C., & Hagglund, G. (2014). 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, 28(1), 82-90. doi:10.1177/0269215512465423
6. Letts M, Shapiro L, Mulder K, Klassen O. The windblown hip syndrome in total body cerebral palsy. Journal of Pediatric Orthopaedics. 1984;4(1):55-62.

H6: Looking Beyond RCTs: Improving Clinical Applicability & Rigour in Seating & Wheeled Mobility Research

Lisa Kenyon
Bill Miller

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

1. Compare and contrast 5 different single subject research designs (SSRDs) for use in seating and wheeled mobility research.
2. Identify 3 potential benefits of using SSRDs in seating and wheeled mobility research.
3. Identify 3 potential challenges of using SSRDs in seating and wheeled mobility research.
4. Discuss 5 ways to improve the methodological rigor and reporting of SSRDs in seating and wheeled mobility research.

Session description:
The randomized controlled trial (RCT) has long been touted as the pinnacle of research evidence but RCTs may not always be clinically applicable in the complex, real world of seating and wheeled mobility clinical practice. This session will focus on use of single-subject research designs (SSRDs), a clinically oriented yet rigorous research design that allows both researchers and clinicians to quantitatively evaluate and validate outcomes within seating and wheeled mobility practice. Various types of SSRDs will be explored through the lens of evidence-based practice. Levels of evidence provided by specific SSRDs will be considered. Benefits of and challenges to using SSRDs in seating and wheeled mobility research will be presented and discussed. The Quality Questions in SSRDs and the Single-Case Reporting guideline In Behavioural interventions (SCRIBE) statement will be considered as guides to increase methodological rigor and improve reporting methods in SSRDs. Attendees are encouraged to come to the session with ideas from their own practice or research so that they can initiate the process of planning an SSRDs to enhance evidence in seating and wheeled mobility practice.

Content references:

1. Kenyon LK, Chapman A, Williams B, Miller WC. Use of single-subject research designs in seating and wheeled mobility research: a scoping review. Disabil Rehabil: Assist Technol. 2019. In press. Available early on-line at: https://tandfonline.com/doi/full/10.1080/17483107.2018.1550115.
2. Bloom, M., Fishcer, J., Orme, J.G. (2009). Evaluating Practice: Guidelines for the Accountable Professional. Boston, MA: Pearson Publishers.
3. Barnett, S.D., Heinemann, A.W., Libin, A., Houts, A.C., Gassaway, J., Sen-Gupa, S., …Brossart, D.F. (2012). Small N designs for rehabilitation research. Journal of Rehabilitation Research and Development, 49(1), 175-186.
4. Logan, L.R., Hickman, R.R., Harris, S.R., Heriza, C. B. (2008). Single-subject research design: recommendations for levels of evidence and quality rating. Developmental Medicine & Child Neurology, 50(2), 99-103.
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6. Perdices, M., Tate, R.L. (2009). Single-subject designs as a tool for evidence-based clinical practice: Are they unrecognised and undervalued? Neuropsychological Rehabilitation, 19(6), 904-927.

H7: Mass Customization 3D Printing for Complex Rehab: Finding Common Threads for Point of Care Manufacturing

Richard Pasillas
Victor Carvente
Jeremy Cantu

Learning objectives:

1. Describe the nature and mechanism of 3D printing technologies as applicable to the seating and mobility industry.
2. Spell out which tools or assets are most accessible for expediting mass customization.
3. Actuate a plan to integrate 3D printing technologies into one's own workplace.

Session description:
As fabricators and clinicians, the biggest challenge we face in dispensing complex rehab services is to problem solve and produce, a one-of-a-kind solution, in a timely and cost-effective manner. Fortunately, there are numerous ways to address these challenges. However, ultimately, we each must question whether the funding source will provide adequate reimbursement for the proposed one-off solution and whether time constraints or location circumstances are conducive to the drafted proposal.

As a group of technologies, desktop 3D printing can help reduce fabrication costs to agile minimums, in terms of labor, materials, floor space, tooling requirements 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. Still further, is the advantage that these archived solutions can be re-dispensed, embellished, resized to new anthropometrics or repurposed from a more expedient, less expensive starting point. In other words, this class of technologies represents the ideal tool for mass customization. (1)(4)

3D Printing technology can be acquired by every member of our industry (2)(5) (personally or professionally). This 120-minute presentation will detail numerous aspects in which the technology is currently used to dispense a wide range of seating, positioning, mobility and ADL related components and accessories. Numerous examples will be available for audience members to inspect first hand.

The goal for this presentation is to spread awareness and technical insight for an accessible, open-source tool. Examples from various countries will be highlighted, along with recommendations for what to look for when making equipment, software and feedstock purchases. A generalized description of the postural complexities and positioning requirements for the 550+ consumers and 2,000+ posture and positioning aids already dispensed by the principals will also be discussed.

Content references:

1. The Ten Principles Of 3D Printing https://tinyurl.com/y3y9d2s9
2. 3D Printing Introduction for Occupational Therapists and Students https://tinyurl.com/yy47vgu8
3. A 3D Printed Seat With A Cellular Structure That Molds to Your Butt https://tinyurl.com/yyb64jbd
4. Computer-aided Product Design With Performance-Tailored Mesostructures https://tinyurl.com/y2xxs4q5
5. 3D Printing and Developing Patient Optimized Rehab. Tools (Port) - A Technological Leap https://tinyurl.com/y5knuo8j

H8: Panel discussion on 3-D printing – what is current, new and where are the future possibilities?

Dr Gianni Renda
Professor Blair Kuy
Hana Phillips

Session description:
The panel have all worked and studied 3-D printing extensively in commercial, research and educational contexts; and are aware of not only the potential but also the current limitations to 3-D printing as a mode and a medium. This is an opportunity for conference participants to ask all you wanted to know about 3-D printing, but have been afraid to ask…

H9: Adding Shape and Dynamic Mobility to Enhance Stability!

Sheila Buck, OT

Learning objectives:

1. To review how contoured seating as well as dynamic mobility bases can enhance the development of cognition
2. To understand how reflex patterning and autonomic responses can influence the prescription of a seating and mobility system
3. To evaluate how 3 point positioning and orientation in space can affect muscle tone through contoured seating

Session description:

This instructional workshop will look at new advances in pediatric dynamic seating and mobility bases in combination with enhanced support shaping. We will review how these systems can enhance muscle tone, improve posture and balance while providing opportunity for fine and gross motor coordination through activity. Understanding of early autonomic responses and their influence on tone will assist in understanding the benefit of contoured seating and dynamic movement within the mobility system. We will consider how custom contoured seating and dynamic mobility can enhance attention/orientation to particular stimulus, and affect other higher forms of learning such as speech, reading, writing, memory and thinking. In order for children to have fun, grow, develop and learn, it is important for them to be seated appropriately for their size and functional needs. Adding in growth factors is a challenge. The mobility base selected must enhance their functional status while maintaining postural control and maximizing movement where able. Overall goals of seating and mobility for play and function may include but not be limited to: comfort and increased endurance, stability for active movement, prevention of postural deformity, heightened awareness level for learning, improved visual field, and increased social interaction. This session will take a look at how enhanced contoured seating and dynamic mobility for our little folks will add to their growth and development through case studies and literature review.

Content references:

1. Buck, S., (2009) revised (2017)More Than 4 Wheels: applying clinical practice to seating, mobility and assistive technology. Milton, ON Self published
2. Cook, A., Polgar, J. (2008) Cook and Hussey's Assistive Technologies: Principles and Practice. St. Louis, MO: Mosby-Elsevier
3. Lang, M., Minkel, J. Seating and Wheeled Mobility: A Clinical Resource Guide,(2018). Thorofare, NJ: Slack Inc.
4. Hetzel, T. (2015), Destructive Postural Tendencies: Identification and Treatment. Retrieved from http//www.ridedesigns.com/resource

H10: Shock and vibration – Exploring methods to reduce the physiological and functional implications for wheelchair users

Nick Reginato, OT

Learning objectives:
By the end of the session participants will be able to:

1. Identify wheelchair users that are more likely to be affected by shock and vibration
2. Identify at least 3 physiological and/or functional implications that excess shock and vibration has on the wheelchair user.
3. Identify at least 3 methods to reduce the levels of shock and vibration experienced by wheelchair users.

Session description:
Over the past few years technological advancements have focused on ways to improve the ride quality for wheelchair users, both powered and manual. A literature review was conducted which identifies that the impact of shock and vibration can have detrimental effects on the wheelchair user.

This session will look at some of the evidence to support the need to focus on ride quality for wheelchair users. The physiological effects for wheelchair users will be explained, as well as an in depth look at what implications this issue can have on functional independence.

We will explore not only the advancements in technology designed to reduce the experience of shock and vibration, but also take a wholistic risk management approach to try and eliminate the issue for wheelchair users.

Content references:

1. Health risks of vibration exposure to wheelchair users in the community
   Yasmin Garcia-Mendez,Jonathan L. Pearlman,Michael L. Boninger &Rory A. Cooper Pages 365-375 | Published online: 15 Nov 2013
2. Vibration exposure of individuals using wheelchairs over sidewalk surfaces
   Erik Wolf,Jonathan Pearlman,Rory A. Cooper , Ph.D.,Shirley G. Fitzgerald,Annmarie Kelleher,Diane M. Collins, show all ages 1443-1449 | Accepted 01 Jul 2005, Published online: 14 Sep 2009
3. Pedestrian Pathway Characteristics and Their Implications on Wheelchair Users
   Jonathan Pearlman PhD ,Rory Cooper PhD,Jonathan Duvall BS &Ryan Livingston BS
   Pages 230-239 | Accepted author version posted online: 04 Mar 2013, Published online: 04 Mar 2013
4. Evaluation of Electric Powered Wheelchairs and Exposure to Whole-Body Vibration
   Wolf, Erik Jason (2007) Evaluation of Electric Powered Wheelchairs and Exposure to Whole-Body Vibration. Doctoral Dissertation, University of Pittsburgh. (Unpublished)
5. The pain experiences of powered wheelchair users
   Andrew O. Frank, Lorraine H. De Souza, Julia L. Frank & Claudius Neophytou
   Pages 770-778 | Received 26 May 2011, Accepted 30 Aug 2011, Published online: 21 Oct 2011
6. Whole-body vibration during manual wheelchair propulsion with selected seat cushions and back supports
   C.P. DiGiovine ; R.A. Cooper ; S.G. Fitzgerald ; M.L. Boninger ; E.J. Wolf ; Songfeng Guo
   IEEE Transactions on Neural Systems and Rehabilitation Engineering; Volume 11 Issue 3 • Sept. 2003

I1: Consumer-defined outcomes: applying the Assistive Technology Outcomes Framework applied to wheeled mobility and seating

Dr Natasha Layton
Carl Thompson

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

1. Identify the wholistic dimensions of outcome from a consumer perspective
2. Articulate the range of outcomes potentialed by wheeled mobility and seating across seven outcome domains
3. Select strategies to collaborate with our consumers in making a funding and policy-relevant case for wheeled mobility and seating provision

Session description:
My AT Outcomes Framework translates and scales assistive technology and service delivery research evidence into practical tools for use by consumers and their practitioners. The Framework fills an identified gap in policy-relevant, consumer-focussed outcome measurement. My AT Outcome Framework comprises tools to capture 6 outcome dimensions, and a summary tool:

1. My Supports
2. My Outcomes
3. My Costs
4. My Rights
5. My Service Delivery Pathway
6. My Customer Experience
7. Summary Tool

The Framework builds on evidence into disability costs and outcomes and responds to the imperative of assistive technology users to turn their personal 'case stories' into useable data. This workshop does a 'deep dive' into the wheeled mobility and seating application of the AT Outcome Framework.

Content references:

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3. Andrich, R. (2018). *Tracking Individual Assistive Technology Interventions and Measuring Their Outcomes*. Paper presented at the Computers Helping People with Special Needs. ICCHP 2018. http://www.icchp.org/
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6. Dijkers, M., Whiteneck, G., & El-Jaroudi, R. (2000). Measures of Social Outcomes in Disability Research. *Archives of Physical Medicine and Rehabilitation*, 81(Supplement 2), S63 - S80. doi:doi:10.1053/apmr.2000.20627

I2: Peer Mentored Wheelchair Skills Training - Let's Get This Going!

Beth Knight, OT
Glenn McDonald
Wendy Hartley, OT

Learning objectives:
Attendees will:

1. Have knowledge on how to implement a wheelchair skills training program with a group or 1:1
2. Have an awareness of the benefits and pitfalls of wheelchair skills sessions from the perspective of the therapist and peer mentors involved.
3. Understand the value of peer led programmes

Session description:
There is theory and then there is practice - who better to teach wheelchair skills than an experienced wheelchair user. Seating To Go employ and train experienced wheelchair users to become peer mentors to teach and inspire people to develop and improve their wheelchair skills. Focus areas include: Ramps and curbs, wheelies, push technique, power wheelchair control and community access. Therapists are involved to help facilitate the session and involve technicians to make changes to wheelchair configuration to aid with improving client's skills. These group sessions have developed over the last 4 years with awesome feedback from users and we would like to share how these are run to inspire you to set up a similar programme.

Presenters will speak about their experiences of:

- Implementing wheelchair skills sessions with adults, primary school, and preschool age children.
- The highs, lows, benefits, celebrations and pitfalls of attending wheelchair skills from the perspective of the participant, mentor, spotter and therapist.
- Balancing safety and risk
- What is required when setting up a skills session, what do you need to plan for.
- The role of the therapist within the group
- How skills are adapted during the sessions to remain responsive to the needs of the participants
- How wheelchair skills training is evolving within our service including a research project on measuring the effectiveness of peer led wheelchair sessions with children.

Demonstrations and video will also be used to support the presentation. There will be opportunity for participants to ask questions.

Content references:

1. Axelson, P., Chesney, D., Minkle, J & Peer, A. (1998). Manual Wheelchair Training Guide. Santa Cruz, USA; PAX Press.
2. Best, K.L., Miller, W.C., Huston, G., Routhier, F., & Eng, J.J. (2015) Pilot Study of a Peer-Led Wheelchair Training Program to Improve Self-Efficacy Using a Manual Wheelchair: A Randomized Controlled Trial. *Archives of Physical Medicine and Rehabilitation*
3. Dalhousie University. (n.d.) *Wheelchair Skills Program.* Retrieved from https://www.wheelchairskillsprogram.ca/en/
4. Sawatzky, B., Rushton, P.W., Denison, I., and McDonald, R. (2012). Wheelchair skills training programme for children: A pilot study. *Australian Occupational Therapy Journal*
5. Smith, E.M., Sakakibara, B.M., & Miller, W. C. (2014) A review of factors influencing participation in social and community activities for wheelchair users. *Disability and Rehabilitation: Assistive technology, 1-14. Doi:10.3109/17483107.2014.989420*
6. Worobey, L.A., Dyson-Hudson,T.A., Cowan, R., Presperin Pederson, J.,Shea, M., & Boninger, M.L (2016).Effectiveness of Group Wheelchair Skills Training for people with Spinal Cord Injury: A randomised Controlled Trial. *Archives of physical medicine and rehabilitation.*

I3: GAME ON! Adaptive Sports Innovation for Athletes with Complex Disabilities

Kendra Betz, PT

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

1. List five professional skills or areas of knowledge that can be directly applied to supporting clients in adaptive sport and recreation participation.
2. Describe three recent technology innovations that support athletes with complex impairments to participate in sports.
3. Summarize two adaptive sports options that empower participation by people who use power wheelchairs.
4. Discuss three critical considerations when providing seating interventions for adaptive sports equipment.
5. Identify three resources for more information on assistive technologies for sports and recreation.

Session description:
Recent innovations in assistive technology create an unprecedented opportunity for individuals with the most complex disabilities to participate in a wide realm of adaptive sports. While individuals who use wheelchairs have had many options for sports participation for decades, engagement in most activities has been restricted to those who are highly accomplished manual wheelchair users who are able to use customized court sport chairs, high tech handcycles, and other adaptive technologies that require a significant amount of upper extremity function to use effectively. With increased attention on expanding the kinds of sports available along with focused efforts on developing assistive technologies to support individuals with significant impairments, individuals who typically use complex power wheelchairs, and even drive with alternative controls, can now participate as athletes. Examples of sports options for athletes with high level and/or complex disabilities include skiing, water sports like kayaking and sailing, boccia, shooting, curling and soccer. Regardless of the athlete's personal goals for recreational play or elite level competition, providing the optimal assistive technology, including custom seating interventions and specialized configurations, maximizes enjoyment and success for any chosen sport. This session highlights the significant roles that AT and seating/mobility professionals play in promoting sports and recreation opportunities for clients with the most significant impairments. Attendees will gain new insight into the revolutionary innovations in AT that support sports participation regardless of client limitations. Case examples with action photos and video will be utilized to demonstrate appropriate processes for adaptive sports interventions. Guidance for accessing technologies and resources will be shared.

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1. Cooper RA, Tuakli-Wosornu YA, Henderson GV, Quinby E, Dicianno BE, Tsang K, Ding D, Cooper R, Crytzer TM, Koontz AM, Rice I, Bleakney AW. Engineering and Technology in Wheelchair Sport. Phys Med Rehabil Clin N Am. 2018 May;29(2):347-369.
2. Crane B, Wininger M, Call E. Orthotic-style off-loading wheelchair seat cushion reduces interface pressure under ischial tuberosities and sacrocccygeal regions. Arch Phys Med Rehabil. 2016. 97:1872-9.
3. Laferrier J, Teodorski E, Cooper R. Investigation of the impact of sports, exercise, and recreation participation on the psychosocial outcomes in a population of Veterans with disabilities: A cross-sectional study. Arch Phys Med Rehabil. 2015. 94(12): 1026-34.
4. Lieberman S. The right stuff. Sports 'N Spokes. 2016, May: 32-35.
5. Nasuti G, Temple A. The risks and benefits of snow sports for people with disabilities: a review of the literature. International Journal of Rehabilitation Research. 2010: 33(3):193-8.

I4: The Impact of MWC Propulsion: From the Paediatric to Adult Shoulder

Rachel Fabiniak
Jennith Bernstein

Learning objectives:

1. Explain two differences in propulsion techniques between adult and paediatric MWC propeller.
2. Describe three considerations for manual wheelchair configuration to decrease the force required by the shoulder during propulsion
3. Compare and contrast two changes in the shoulder that occur based on age of initiated propulsion.

Session description:

The shoulder was designed for mobility but not the kinematic and repetitive pattern that is required during MWC propulsion. There is extensive research on the adult manual wheelchair propeller, their propulsion techniques, their risk and onset of shoulder pain, and guidelines for prescribing manual wheelchairs, but can we utilise this same evidence for paediatric manual wheelchair users? Does the shoulder undergo the same stresses and changes throughout an individual's lifespan? There is a limited body of research on the paediatric shoulder and the impacts of manual wheelchair propulsion. This research suggests that just as we cannot simply "scale down" from adult to paediatric when it comes to equipment, as so, we can also not just take best clinical practice guidelines for adults and apply this to the paediatric MWC propeller. It is crucial for clinicians, whether working with paediatrics or adults with early onset MWC propulsion, to understand the changes over the shoulder over time and how this impacts the end-user's independence, function, propulsion technique, pain, and the internal changes occurring within the shoulder.

This presentation will begin with a look at the differences along the age continuum with the paediatric versus adult shoulders as it applies to the changes of the shoulder anatomically and its functional and biomechanical impact. We will then evaluate paediatric shoulder considerations during manual wheelchair propulsion looking at the current research, gaps in the current research, and how this research applies to our clinical practice. Discussion on areas for best clinical practice will include propulsion training, utilisation of functional outcomes measures, manual wheelchair configuration, and assessment of appropriateness along the age continuum.

Content references:

1. Schnorenberg, A. J., Slavens, B. A., Wang, M., Vogel, L. C., Smith, P. A., & Harris, G. F. (2013). Biomechanical model for evaluation of pediatric upper extremity joint dynamics during wheelchair mobility. *Journal of biomechanics*, 47(1), 269–276.
2. Slavens, B. A., Schnorenberg, A. J., Aurit, C. M., Graf, A., Krzak, J. J., Reiners, K., … Harris, G. F. (2015). Evaluation of pediatric manual wheelchair mobility using advanced biomechanical methods. *BioMed research international*, 2015, 634768.
3. Slavens, B. A., Schnorenberg, A. J., Aurit, C. M., Tarima, S., Vogel, L. C., & Harris, G. F. (2015). Biomechanics of Pediatric Manual Wheelchair Mobility. *Frontiers in bioengineering and biotechnology*, 3, 137.

J1: Stop the Migration! Pain Reduction Through Seated Posture

Sheila Buck, OT

Learning objectives:

1. To review how contoured seating can enhance stability
2. To identify postural tendencies away from a seated midline
3. To evaluate how 3 point positioning can affect vibration and shearing in a seated posture

Session description:

Wheelchair users often describe discomfort as having pain, feeling the need to move, feeling unstable, feeling physically tired, feeling a burning sensation, sliding out of the wheelchair, feeling stiff and several other components. Persons with decreased neuromuscular function or orthopedic changes are often unable to adjust their body position to redistribute forces, leading to intolerable periods of discomfort. Populations most affected by seating discomfort issues are those with primarily motor impairments with little or no sensory involvement.

Inappropriate or lack of supportive seating can create pain through poor posture, inflexible joint ranges, and peak pressure points due to an inability to shift or alter pressures. Pain can therefore become a primary focus for a wheelchair user, and further create impaired mobility, decreased participation in pleasurable activities. Appropriate seating must be prescribed in order to decrease pain factors in clients. Comfort must be addressed clinically from the outset, even if the client is not identified as being at risk for pressure ulcer formation. Vibration reduction as well as postural support is critical when clients may be in power chairs and moving at higher speeds and over rougher terrain. The increase shock and vibration to the spine and hips can create an increase in compression of the spine as well as shearing movements to the skin. These can lead to increased pain for the client. Manual/foot propulsion can also lead to changes in spinal alignment, shearing and head/pelvic positioning, again leading to pain.

Negative tendencies in postural alignment will then occur as a result of the body moving away from midline to a stable support surface, wherever that may be. Product parameters must include pressure considerations, continuity between surfaces, maximized surface contact, decreased peak pressures, and material considerations of softness, firmness, thermal regulation, and vibration reduction. We also must address pain references, body shape, muscle tone, asymmetries, and pressure points.

Content references:

1. Hobson, D., Crane, B. (2001). State of the Science White Paper on Wheelchair Seating Comfort, University of Pittsburgh. Paper presented at the State of the Science Workshop
2. Helander, M.G., & Zhang, L. (1997). Field studies of comfort and discomfort in sitting. Ergonomics, 40(9), 895 – 915.
3. Herzberg, S. (1993). Positioning the nursing home resident: an issue of quality of life. American Journal of Occupational Therapy, 47(1), 75 – 77.
4. Lange, M., & Minkel, J. (Eds). (2018). Seating and Wheeled Mobility: a Clinical Resource Guide. Thorofare, NJ: Slack Incorporated
5. Monette, M., Weiss-Lambrou, R., & Dansereau, J. (1999). In search of a better understanding of wheelchair sitting comfort and discomfort. Paper presented at the RESNA Annual conference.

J2: Postural Care in Aged Care

Bas Jansen, PT

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

1. Identify why postural care is important in aged care
2. Understand how supported supine lying may prevent pressure injuries
3. Understand how to prevent, minimise or correct body shape distortion

Session description:
A person's lying posture can have a distorting impact on their body shape and structure. The way you lie becomes the way you sit (1) This is particularly relevant when people lose their ability to move. Their reduced ability to effectively change position in lying and sitting is directly related to the development of destructive changes in body shape. Body shape distortion impacts on health, function and quality of life. It appears that the interrelationship between position/posture, mobility and gravity determine body shape (2,4,5,6,7,8). More research is needed to get a better understanding of how the body distorts and how this can be prevented (3) but this doesn't mean that we can't actively take positive steps to increase comfort, improve sleep, and manage pressure care while protecting body shape proactively.
The goal is:

- To provided examples and identify the need for 24-hour postural care in aged care
- To raise awareness on how supported lying can prevent minimise or restore body shape distortions
- How to safeguard against respiratory issues (reflux, breathing), pressure injuries
- How postural care can facilitate sleep, and increased comfort at night in bed
- To share some experiences from people who have successfully introduced postural care in aged care homes.
-

Providing effective postural care in aged care can be one of the most effective and rewarding intervention for people who are losing or have lost their ability to move. It is preventative and protects against body shape distortion, it improves comfort, can reduce care needs and health care cost. Postural care is not rocket science, but it requires behavioural change of all involved, from the resident to the management of care homes.

Content references:

1. Hill (Clayton), Sarah, and John Goldsmith. "Biomechanics and prevention of body shape distortion." Tizard Learning Disability Review 15.2 (2010): 15-32.
2. Associate Professor Christopher Poulos, Kelly, J., Chapman, R., Crane, A., Forbes, R., Gresham, M., … Neylon, S. (2012). Review of current seating practices in supporting people living with dementia in residential aged care – a pilot study.
3. Novak, Iona. 2013. "Stand up and Be Counted." Developmental Medicine and Child Neurology 55 (11): 974.
4. Castle D, Stubbs B, Clayton S, Soundy A. A 24-hour postural care service: Views, understanding and training needs of referring multidisciplinary staff. Int J Ther Rehab. 2014;21(3):132-139.
5. Innocente, R. (2014). Night-time positioning equipment: A review of practices. New Zealand Journal of Occupational Therapy, 61(1), 13–20.
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8. Stephens, M, Bartley, CA and Priestley, C. (2018). Evaluation of night time therapeutic positioning system for adults with complex postural problems. Published Online. Retrieved from http://usir.salford.ac.uk/48470/

J3: Paediatric Powered Mobility Outcome Measures: From Theory to Practice

Naomi Gefen
Lori Rosenberg
Lisa K. Kenyon
Lisbeth Nilsson

Learning objectives:
Upon completion of this session, the participant will be able to:

1. Discuss five different outcome measures to evaluate a child's powered mobility use
2. Determine the most appropriate power mobility outcome measure(s) for a specific child based on the child's power mobility learner group.
3. Plan powered mobility interventions using specific outcome measure(s) as a guide.

Session description:
Children with severe motor disabilities who lack independent mobility often develop lack of curiosity and initiative, learned helplessness, passivity and dependency. Power mobility allows them to access fundamental experiences, thereby promoting development, function and participation. Powered mobility also has a crucial role in quality of life. Learning to use a power mobility device is a complex task and researchers have defined three groups of learners- exploratory, operational and functional. Extensive practice is often required for a child to be able to progress between the groups and to become independent and effective in using a powered chair. Task-based or process-based outcome measures are necessary tools for assessment of learning - the child's level of performance and improvements, and assessment for learning – identify which skills are effective and which need more practice, giving guidance to choose appropriate intervention.

In this session, five outcome measures will be presented: Powered Mobility Program (PMP), Assessment of Learning Powered Mobility use (ALP), Powered Mobility Training Tool (PMTT), Wheelchair Outcome Measure – Young Person (WhOM-YP) and the Israel Ministry of Health outcome measure. Videos and case studies will be used to demonstrate the implementation of each outcome measure and their relevance to each learners group. Features of each outcome measure will be explored including how each measure can be used to evaluate and plan powered mobility interventions.

Content references:

1. Field, D. A., & Livingstone, R. W. (2018). Power mobility skill progression for children and adolescents: a systematic review of measures and their clinical application. *Developmental Medicine & Child Neurology*.1011-997 ,(10)*60* ,
2. Kenyon, L. K., Farris, J. P., Cain, B., King, E., & VandenBerg, A. (2018). Development and content validation of the power mobility training tool. *Disability and Rehabilitation: Assistive Technology*.24-10 ,(1)*13* ,
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6. Butler, C., Okamoto, G. A., & McKay, T. M. (1983). Powered mobility for very young disabled children. *Developmental Medicine & Child Neurology*.474-472 ,(4)*25* ,

J4: It's a Big World Out There: Global Initiatives Applied to the Pacific Islands Context

Debbie Wilson, OT
Lauren Flaherty, OT

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

1. Access resource material to assist with building capacity in less resourced countries.
2. Identify at least 4 priority actions for the sector over the next 5 years.
3. Reflect on the implementation plan for service provision in the Pacific Islands

Session description:
This presentation begins with a personal reflection from Deb's involvement in the International Wheelchair Stakeholders meeting in Bangalore, India, 2018, and the Seating To Go partnership with Motivation Australia in the Pacific Islands. Being part of a busy wheelchair and seating assessment service in New Zealand can be all consuming and leave very little opportunity to reflect on how best to contribute to capacity building in less resourced countries. Participation in the International Wheelchair Stakeholder's meeting provided an opportunity to discuss current initiatives and challenges, and to identify sector goals and priority actions using the themes of *Policy, Provision, Personnel and Products*, for the next 5 years.

In April 2019, the first Pacific Rehabilitation and Mobility Conference was held in Nadi, Fiji, with more than 90 representatives from Pacific Island service providers, disabled person's organisations and international NGO's. Lauren will describe how the priority actions are being implemented in the Pacific region and how the conference has signalled a new phase in the development of Pacific Island service provision. Lauren will also reflect on treading softly while also providing timely, professional and practical input for service providers, DPO's and government agencies.

Content references:

1. World Health Organization. Global Cooperation on Assistive Technology (GATE). Geneva:WHO; 2018 [cited 2018 December 3]. Available from: http://www.who.int/phi/implementation/assistive_technology/phi_gate/en/
2. World Learning. Wheelchair Stakeholders' Meeting: Meeting Report. 2018.
3. Pacific Rehabilitation and Mobility Conference Report: Pacific leaders Creating Sustainable Services. Available from: https://www.motivation.org.au/limesquare/wp-content/uploads/2019/07/MA-conference-REPORT-Jun19-RevB_web_ProgrammeAttached.pdf

Closing Keynote: A Relationally Responsive Rehabilitation

James Arkwright

Learning objectives:
At the completion of this session, attendees will have been invited to reflect on and further explore:

1. How they understand their professional relationships with clients.
2. What their natural and learned style of relating to clients has developed into and become within their professional practice.
3. Drawing on their own professional experiences, reflect on how a strongly relationally responsive rehabilitation can assist in maximising client rehabilitation outcomes.

Session description:
In reflecting on thirty plus years of receiving assessment and facilitation of rehabilitation equipment and services, James considers when it has been outstanding and when it's best not to remember it! The key that stands out in these personal reflections, and in reviewing findings from several research projects regarding 'agentic actions' of people with impairments and/or chronic illness (Arkwright, 2018), is how critical a 'relationally responsive rehabilitation' is. Further, what a relationally responsive rehabilitation might look like in practice. Using humour as he stories personal vignettes and professional practice examples, James teases-out how rehabilitation professionals can combine and integrate the use 'self', 'professional knowledge' and 'relational skills' to enhance client rehabilitation outcomes.

Content references:

1. Arkwright, J. (2018). Inclusion in education: 'A piggy back will do?'. In C. Matthews., U. Edgington., & A. Channon. (Eds.). *Teaching with sociological imagination in higher education: Contexts, pedagogies, reflections*. (pp. 19-38). Singapore: Springer.

Speaker biography:
Dr Arkwright has over thirty years' experience of professional partnerships, both as a consumer of rehabilitation and disability services and as a social practice professional and educator. When he was twenty two years of age, James had a motor bike accident on a farm that resulted in him incurring tetraplegia. With his options seeming limited, he undertook a BA and then a Masters in Counselling. He has worked in the fields of disability services, rehabilitation, counselling and tertiary education. His doctoral thesis was in the area of illness/disability, and he has undertaken subsequent research in organisational change and inclusive education. He currently works at Bethlehem Tertiary Institute (NZ) where he is the Head of School of Social Practice, which includes the social work and counselling programmes. At OSS 2019, he is looking forward to bringing together his thirty plus years' experience as a wheelchair user with his professional commitment to strength-based and collaborative practices.

EXHIBITORS

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Paragon Mobility was formed in 2009 as an independent supplier of Complex Rehabilitation Equipment. With a portfolio of World Class product, Paragon Mobility provides comprehensive Wheelchair, Seating, Mobile Shower Commodes, Wheelchair Accessories and “Off Road” mobility access products. With decades of experience in the complex Mobility Industry, Paragon Mobility staff, backed by our global manufacturers, are well credentialed to discuss our portfolio suitability for your clients’ needs.

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ILS was founded in 2004 and ILS has 20 showroom facilities and operate three interstate offices.

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OUR PRODUCTS

- SPEX modular wheelchair seating for all ages: Adaptable seating which installs onto any wheelchair base. Catering for all wheelchair users from basic needs to severely complex asymmetric body contours, SPEX provides on-the-spot results.
- Shuttle Discovery Stroller for infants and young children: Discovery caters for very small children from six months of age upward, giving it a unique standpoint in the market. Achieve the best possible positioning for an infant or small child with special needs, while meeting the parents' aesthetic values.

www.medifab.com
www.spexseating.com
www.shuttlediscovery.com

MELROSE WHEELCHAIRS

Melrose Kiwi Concept Chairs is a New Zealand company manufacturing custom made manual lightweight wheelchairs for NZ and international markets

After an accident Phil Melrose believed he could make a better wheelchair that suited his needs better than any other wheelchair offered him. He bought together a team who were passionate about design and fabrication to build wheelchairs for individuals. After 25 years that small team is now 40 and the same passion to understand the needs of wheelchairs user's remains. Our custom wheelchairs are made to fit you and to suit the way you move. Our wheelchairs are Uniquely You.

www.wheelchairs.co.nz
www.melrosewheelchairs.com.au

OTTOBOCK

All around the world, the Ottobock name stands for high quality and technologically outstanding products and services. With 50 sales, service subsidiaries, and export activities in over 140 countries across the globe, we are constantly in close contact with our customers.

Otto Bock Australia delivers quality, innovative mobility solutions. From paediatric through to geriatric, the Human Mobility product portfolio addresses a broad spectrum of needs across a wide range of age groups. Working with our distribution partners, we aim to deliver industry leading advice, support and service to patients, their therapists and institutions.

"Quality for life", the quality of life enjoyed by the people who use Ottobock products every day.

www.ottobock.com

PATIENT HANDLING

We are a business delivering personalised service to any facility or individual who requires manual handling or patient care equipment. Not only do we offer high quality products we also offer excellent service along with specialised training to ensure you are confident using our products.

We are the exclusive Australian Importers of Molift Patient Lifters and Ceiling Hoists from Norway and our team of qualified installers fit Rail Systems with these Hoist motors into homes and facilities. We also exclusively import TA-Service scripted Power wheelchairs from Denmark offering chair users a highly featured chair with tilt and elevate as standard. We will have the company founder and designer on our stand to answer your questions about the TA range which includes an indoor and 3 outdoor models.

Our extensive range of Patient Handling equipment is used in a number of hospitals and facilities across Australia.

www.patienthandling.com.au

QUANTUM REHAB

Quantum Rehab® was born out of the desire to delight customers with the most advanced, consumer-inspired complex rehab power wheelchairs and related technologies possible.

Clinically-focused and consumer-inspired, Quantum Rehab products are engineered and manufactured to meet the widest range of complex rehab needs with functional, durable, stylised, high-performance designs to increase daily functionality and quality of life. At Quantum, consumer needs and wishes are the driving force. We're dedicated to not just meeting medical and clinical needs, but also quality-of-life needs.

With such focus and vision, Quantum leads the market with innovations in power bases, seating and drive controls. As a global innovator, Quantum products include the Edge 3, Q6 Edge® 2.0, 4Front®, and other power bases, iLevel® seat elevation technology, TRU-Balance® 3 Power Positioning Systems, Q-Logic 3 Advanced Drive Control System, and Stealth Products® cushions and positioning components.

www.pridemobility.com.au

REHAB HIRE

Rehab Hire is a dedicated sale and hire business specialising in the supply and prescription of hospital and complex rehabilitation equipment in the Melbourne Metropolitan area

At Rehab Hire we know how important functional mobility is for your independence. That's why we'll work closely with you and your therapist to identify your mobility goals to ensure you can remain as independent as possible. Not all equipment is suited to everyone. Our team can meet with you and you treating therapist in your home or facility to trial equipment to meet your individual needs.

Experience the pleasure of dealing with industry experts who not only understand their equipment, but also understand the needs of their clients.

www.rehabhire.com.au

SECOND SKIN

Second Skin is a world leader in the design, manufacture and service delivery of custom made dynamic splints and orthoses for the management of children and adults with neurological conditions. Our dynamic splints are prescribed for clients with cerebral palsy, acquired brain injury, cerebrovascular accident (CVA/stroke), autistic spectrum disorders and congenital abnormalities. Each of our products is prescribed on an individual basis to meet our client's specific medical and therapeutic needs, in conjunction with their seating system, other equipment and therapy goals.

Second Skin provides services in Australia, United Kingdom, Ireland and New Zealand.

www.secondskin.com.au

SUNRISE MEDICAL

Sunrise Medical Australia's daily goal is to improve the lives of people by developing innovative, high quality products designed to promote independent and involved lifestyles. We pride ourselves as being a global leader of a wide range of rehabilitation and mobility products including manual wheelchairs; power wheelchairs; standard and customised seating; pressure cushions; positioning systems; electric mobility scooters and everyday living aids. Our Family of Brands include Quickie, Zippie, Leckey, Breezy, RGK, JAY, JCM, Whitmyer, Sterling & Switch It.

www.sunrisemedical.com.au

WILA INNOVATIONS

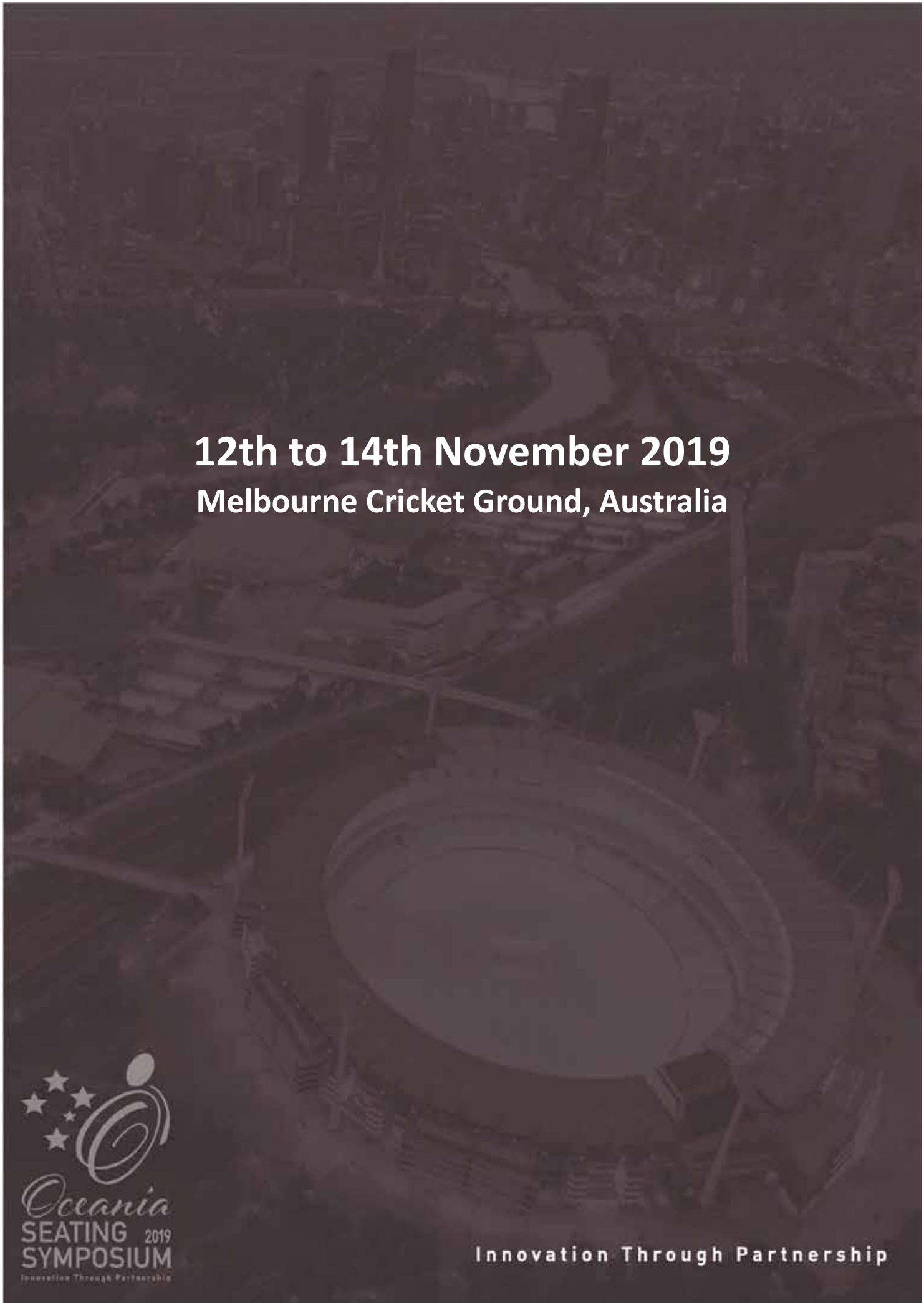
Quality of life enhanced through innovation in assistive technology

WILA Innovations specialises in providing a full range of disability equipment.

WILA Innovations is the Australian distributor for the full range of Vicair pressure care products including the Vicair O2 range, the 1st fully machine washable wheelchair cushion, backrests, mattress, Maxxcare heel protectors and the iShear that measures shear force.

Other products WILA represents are FOCAL dynamic arm supports, Obi robotic feeding device and VELA work and active chairs. W: www.wila-products.com.au
E: info@wila-products.com.au Ph: (02) 9674 5315

www.wila-products.com.au



12th to 14th November 2019

Melbourne Cricket Ground, Australia

Oceania SEATING SYMPOSIUM 2019

Innovation Through Partnership

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