



2019 Research Showcase



Rehabilitation Sciences Institute

Abstract Book



UNIVERSITY OF
TORONTO

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Welcome

A message from the Director of RSI, Dr. Angela Colantonio



I would like to extend a warm welcome to all attending and participating in our annual student led Rehabilitation Sciences Institute Research Day. This is a very proud day for us all as we see the passion and talent of our student body in action. I look forward to all the oral and poster presentations that cover a vast range of important topics in the rehabilitation field. None of this would be possible without the support of our extraordinary faculty mentors, staff, supporters, sponsors and friends of RSI. I also recognize the strong support of the Faculty of Medicine leadership for the rehabilitation sector that has made scaling up rehabilitation research and training a priority this year.

Our student leaders have been active throughout the year with many so many initiatives. They continue to host mentorship events with our alumni and also more specifically among the student body. They also participated in another sold out Spring Reunion event focused on mental health. Theme based speaker events were hosted with great success. rehabINK, our student led magazine just published its 6th edition and we are currently planning a lecture series on leadership. This year we also created an Indigenous Health Research Committee with related events for both faculty and students. Further, we created a new undergraduate “Rehab Scholar” program to expose undergraduates to the world of rehabilitation science.

I wish to sincerely thank Dr. Michael Strong, President of the Canadian Institutes of Health Research for graciously accepting our invitation to provide opening remarks. We also welcome Dr. Alison Cernich, Director of the National Center for Medical Rehabilitation Research, NIH, who travelled from the US to be our keynote speaker today!

A message from the Graduate Coordinator of RSI, Dr. Yana Yunusova



Welcome to the RSI Research Day 2019, an exciting and long-anticipated event for our students and faculty. In a short time in my new role as a graduate coordinator, I have developed a great appreciation for the breadth of research conducted by our students. Today we proudly showcase research on balance, community engagement, neuroscience of speech and language, occupational health, neurostimulation, swallowing disorders, telehealth, among others. This research is directly impacting individuals living with traumatic brain injury, stroke, amyotrophic lateral sclerosis, spinal cord injury, Parkinson’s disease, mental health issues, to name a few. Today everyone will have an opportunity to

increase their knowledge, expand understanding, and excite passion for scientific discovery. Further, everyone will get a chance to network with current and future collaborators and colleagues.

This day is entirely organized by our students. I would like to thank the Research Day Organizing committee for their tireless work, excellent strategic thinking, and impressive organizational skills. Our appreciation goes to: Fiona Höbler, Chen Xiong, Andrea Hung, Mary Boulos, Konika Nirmalanathan, Tyler Saumur, Samira Omar, Analyssa Cardenas, Erin Miller, Stephanie Scodras, Kristina Kokorelias, Jacqueline Nestico, and Sara Hanafy.

Enjoy the day!

A message from the Rehabilitation Sciences Graduate Students' Union



The RSI Research Day is a student-led initiative that is organized and supported by the Rehabilitation Sciences Graduate Students' Union (RSGSU). Welcome to another year and another exciting research showcase of our student body. We, as the RSGSU, are excited to take part in highlighting all of our hard work and the diversity of our research. The RSI Research Day is a unique event as it is organized for the students, by the students. This event is a great environment to support our students,

meet new people, and learn something new.

“Research is formalized curiosity. It is poking and prying with a purpose.” -Zora Neale Hurston

Ask challenging questions, encourage each other, and most importantly, have fun!

To learn more and find out how to get involved, email us: rehabsciencegsu@gmail.com and follow us on Twitter: [@RSGSU](https://twitter.com/RSGSU) and Facebook: [Rehabilitation Graduate Student Union](https://www.facebook.com/Rehabilitation-Graduate-Student-Union)

Sincerely,

The RSGSU Executive Team

Mary Boulos (Co-President)

Sally Abudiab (Co-President)

Amir Tehrani (Vice-President)

Konika Nirmalanathan (Treasurer)

Kristina Kokorelias (Secretary)

Jacqueline Nestico (Social Media)

And all RSGSU Committee Members!

2019 Research Day Committee

Chen Xiong
PhD Candidate

Fiona Höbler
PhD Candidate

Mary Boulos
MSc Student

Analyssa Cardenas
MSc Student

Sara Hanafy
PhD Student

Andrea Hung
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Kristina Kokorelias
PhD Candidate

Erin Miller
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Jacqueline Nestico
MSc Student

Konika Nirmalanathan
MSc Student

Samira Omar
PhD Student

Tyler Saumur
PhD Candidate

Stephanie Scodras
PhD Student

Dr. Yana Yunusova
Graduate Coordinator

Dr. Rena Park Helms
Associate Professor

Diane Wiltshire
Business Officer

A special thank you to the following staff members for their ongoing assistance:

Loida Ares
Administrative Coordinator

Rob Page
Manager of Information Technology

Jessica Boafo
Administrative Assistant

Schedule of the Day

RSI Research Day

Tuesday, May 14th, 2019: 9:00 a.m. – 5:30 p.m.

Macleod Auditorium & Stone Lobby: 1 King’s College Circle, Toronto, ON M5S 3K1

MORNING SESSION	
9:00 – 9:30	<p>Registration <i>Medical Sciences Building</i></p> <p>Poster Set-up <i>Stone Lobby</i></p>
9:30 – 9:50	<p>Opening Remarks <i>Macleod Auditorium</i></p> <ul style="list-style-type: none"> ❖ Dr. Angela Colantonio, PhD, RSI Director ❖ Dr. Trevor Young, MD, PhD, FRCPC, FCAHS, Dean, Faculty of Medicine
9:50 – 10:10	<p>RSI Scholarships and Endowed Awards Presentation <i>Macleod Auditorium</i></p>
10:10 – 10:40	<p>Morning Session <i>Macleod Auditorium</i></p> <ul style="list-style-type: none"> ❖ Dr. Nick Reed, MScOT, PhD, OT Reg (Ont) Senior Clinician Scientist and Occupational Therapist, Concussion Centre, Bloorview Research Institute “To Tweet or not to Tweet: The Twitter Experiences of a Pediatric Concussion Researcher” <div style="display: flex; align-items: flex-start;">  <div> <p>Dr. Nick Reed completed his Bachelor of Kinesiology at McMaster University, his Masters of Science in Occupational Therapy within the Department of Occupational Science and Occupational Therapy at the University of Toronto, and his PhD within the Graduate Department of Rehabilitation Science at the University of Toronto.</p> <p>He is a Senior Clinician Scientist within the Bloorview Research Institute, Co-Director of the Concussion Centre and the Holland Family Chair in Acquired Brain Injury at Holland Bloorview Kids Rehabilitation Hospital. He is also an Associate Professor within the Department of Occupational Science and Occupational Therapy and a member of the Rehabilitation Sciences Institute at the University of Toronto.</p> <p>His work focuses on developing, delivering and evaluating research, educational and clinical programming specific to youth and concussion. His passion is helping youth do the things they need, want and love to do in their lives.</p> </div> </div>

❖ **Dr. Marina B. Wasilewski, PhD**

Postdoctoral Fellow at the Lawrence S. Bloomberg Faculty of Nursing, University of Toronto and Saint Elizabeth Health Care

“Desperate times call for Twitter measures: Overcoming the challenges of traditional recruitment strategies”



Dr. Marina Bastawrous Wasilewski is a postdoctoral fellow at the University of Toronto’s Faculty of Nursing and the Saint Elizabeth Research Centre. She received her PhD from the Rehabilitation Sciences Institute (RSI) at the University of Toronto. Her research interests include aging populations, sandwich generation caregivers, peer support, and online intervention delivery. Dr. Wasilewski has also championed the use of social media—specifically Twitter—in academic research and higher education. She was the inaugural recipient of the RSI Student Leadership Award. Her

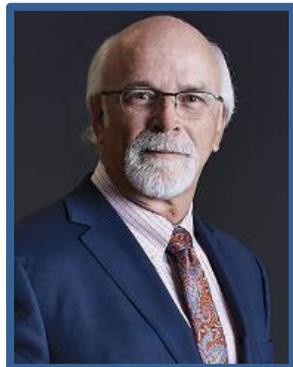
other achievements include 15 peer reviewed publications in high impact journals, attendance at over 25 national and international scientific meetings, and the receipt of nearly \$200,000 in scholarships and awards

10:40 – 11:00

Special Remarks

Macleod Auditorium

❖ **Dr. Michael Strong, MD, PhD, FRCPC, President, CIHR**



Dr. Michael Strong was appointed President of the Canadian Institutes of Health Research (CIHR), effective October 1, 2018. Prior to joining CIHR, Dr. Strong was Dean of the Schulich School of Medicine & Dentistry and a Distinguished University Professor at Western University. From 2000 to 2010, he served as the Chief of Neurology and Co-Chair of the Department of Clinical Neurological Sciences at the London Health Sciences Centre and Western University. He has also served as Co-chair of the Canadian ALS Research Consortium and is a former member of the Board of Directors of the ALS Society of Canada.

Dr. Strong’s clinical research has focused on understanding the neurodegenerative disease amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig’s disease. He is particularly interested in the occurrence of non-motor manifestations of the disease including the cognitive, behavioural, and emotional syndromes associated with ALS. His lab has focused on defining the role of alterations in tau protein metabolism in the frontotemporal syndromes of ALS and, increasingly, in traumatic brain injury.

Dr. Strong has published over 190 peer-reviewed articles and 29 chapters, edited four textbooks, and been invited to give over 160 lectures on ALS research, throughout Canada and around the world. He is a recipient of both the Sheila Essey Award and the Forbes Norris Award, the only Canadian to have received both awards for ALS research. He was also awarded the Queen Elizabeth II Diamond Jubilee Medal, in 2012, for his contributions to ALS research and care.

	<p>Dr. Strong earned his degree in medicine at Queen's University, undertook neurology training at Western University, and completed postgraduate studies at the Laboratory of Central Nervous System Studies at the National Institutes of Health in Bethesda, Maryland.</p>
11:00 – 11:15	<p>Networking Break <i>Macleod Auditorium</i></p>
11:15 – 12:00	<p>Student Presentations: 3 Minute Presentations <i>Macleod Auditorium</i></p> <ul style="list-style-type: none"> ❖ Characterization of language profiles in subacute preschool traumatic brain injury: A retrospective chart review Carly Cermak, PhD Candidate ❖ The effect of prolonged bed rest on balance in healthy adults: A systematic review Tyler Saumur, PhD Candidate ❖ Balance confidence and fear of falling in people with incomplete spinal cord injury after balance training: A mixed methods evaluation Janelle Unger, PhD Candidate ❖ Remotely delivered group neurorehabilitation for acquired brain injury: Feasibility and lessons learned from a newly established telerehabilitation centre Mary Boulos, MSc Student ❖ (Co)constructing concussion with children: A critical qualitative exploration of drawings of concussion Katie Mah, PhD Candidate ❖ The gendered experiences of men with traumatic brain injury (TBI): A qualitative study Andrea D'Souza, MSc Student ❖ Visual feedback balance training with functional electrical stimulation: Impact and perspective of individuals with incomplete spinal cord injury David Houston, MSc Student ❖ Test-retest reliability of frequency-domain measures of balance among people with sub-acute stroke Raabeae Aryan, PhD Student ❖ Identifying cases of spinal cord injury in an Ontario database of primary care electronic medical records John Shepherd, PhD Student ❖ Unexpected Pattern of Longitudinal Recovery in Moderate-Severe Traumatic Brain Injury Using Measures of Reaction Time Inconsistency Sally Abudiab, MSc Student ❖ The effects of virtual reality-induced postural threat on performance of a walking balance task Amir Boroomand-Tehrani, MSc Student

AFTERNOON SESSION

12:00 – 1:00	<p>Keynote Speaker <i>Macleod Auditorium</i></p> <p>❖ Dr. Alison Cernich, PhD Director of the National Center for Medical Rehabilitation Research (NCMRR) "Emerging Innovations in Rehabilitation Research"</p> <div style="display: flex; align-items: center;">  <div style="flex: 1;"> <p>Dr. Alison Cernich, PhD, serves as the Director of the National Center for Medical Rehabilitation Research (NCMRR) at the Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health. She provides oversight for the portfolio of NCMRR and works within NIH to coordinate rehabilitation research. She serves on multiple interagency strategic planning committees and government oversight committees for major research initiatives in the federal government relevant to disability and rehabilitation research.</p> </div> </div>
1:00 – 2:15	<p>Lunch and Networking <i>Stone Lobby</i></p>
1:10 – 1:40	<p>Poster Judging Session 1 <i>Stone Lobby</i></p>
1:45 – 2:15	<p>Poster Judging Session 2 <i>Stone Lobby</i></p>
2:15 – 3:10	<p>Panel Discussion <i>Macleod Auditorium</i> "Engaging Patients in Research"</p> <p>Facilitator: Dr. Sharon Gabison, PhD, Toronto Rehabilitation Institute-UHN, Department of Physical Therapy, University of Toronto</p> <div style="display: flex; align-items: center;">  <div style="flex: 1;"> <p>Dr. Sharon Gabison is the co-chair the Research and Family Engagement Committee and a Family Leader at Holland Bloorview Kids Rehabilitation Hospital. She has sat on several projects as a family research partner. Dr. Gabison teaches at the Department of Physical Therapy at the University of Toronto and is a Post-Doctoral Research Fellow with an interdisciplinary team at Toronto Rehab – UHN, developing technologies to prevent pressure injuries and support home caregivers. She has over 20 years of clinical experience as a Physical Therapist. As a family partner, researcher and advocate, she is passionate about engaging patients, families, caregivers and community partners in research to bridge the gap between research and knowledge translation in order to improve the lives of individuals and their families living with disabilities.</p> </div> </div>

- ❖ **Dr. Janet Parsons**, PhD, Keenan Research Centre for Biomedical Science & Li Ka Shing Knowledge Institute, St. Michael's Hospital; Department of Physical Therapy, University of Toronto



Dr. Janet Parsons is a Research Scientist at the Applied Health Research Centre, Li Ka Shing Knowledge Institute of St. Michael's Hospital and an Associate Professor in the Department of Physical Therapy and the Rehabilitation Sciences Institute, University of Toronto. Dr. Parsons is a qualitative methodologist with a research program focused on the development and application of qualitative narrative and arts-based methodologies to a wide range of health and social issues, and her substantive emphasis is on health equity. She has led and collaborated on numerous participatory and community-engaged studies, including those related to perinatal child custody loss, neighbourhoods and health, mental illness, the opioid crisis, diabetes, problem gambling and poverty, as well as vector-borne diseases. She leads a team of patient engagement researchers at St. Mike's. Most recently, Dr. Parsons is a Principal Investigator on a CIHR-funded national Network grant on Lyme Disease, heading up its patient and community engagement strategy. She is the co-inventor of the Brokered Dialogue method, which aims to promote respectful dialogue and collective critical thinking on controversial health and social issues.

- ❖ **Enrico Quilico**, B.Ed., M.A., PhD Student, Rehabilitation Sciences Institute, University of Toronto



Enrico Quilico is a doctoral student in the Rehabilitation Sciences at the University of Toronto and runs a cross-provincial community-based exercise program for people with moderate to severe traumatic brain injury (TBI) in Montreal. His doctoral research is federally and provincially funded and revolves around the co-creation, implementation, and evaluation of that community program. His participatory approach involves partnering with community members in the development of the inclusive program, which introduces basic skills and peer leadership, while engaging and supporting participants with meaningful activities. Enrico has been working as an advocate for awareness and inclusion for the TBI population since 2008. Enrico's B.Ed. is from Concordia University (Teaching English as a Second Language) and his M.A. is from McGill University (Adapted Physical Activity). He works as a CEGEP professor at TAV College, where he teaches English, Humanities, and Physical Education. Enrico has been working as a leader in the fitness industry for the past decade through the YMCAs of Quebec.

- ❖ **Dr. Shannon Scratch**, PhD, C.Psych., Centre for Leadership in Acquired Brain Injury, Bloorview Research Institute



Dr. Shannon Scratch completed her Master of Psychology and Ph.D. at the University of Melbourne in Australia. She is a Clinician Scientist within the Bloorview Research Institute and Clinical Neuropsychologist at Holland Bloorview Kids Rehabilitation Hospital. She is also an Assistant Professor within the Department of Paediatrics and Rehabilitation Sciences Institute at the University of Toronto. Dr. Scratch's current clinic time is devoted to youth with acquired brain injury (ABI) and their families. In particular, she is dedicated to working with youth experiencing persistent concussion symptoms in the only publicly-funded clinic of its kind in Ontario. From a research perspective, she is involved in neuropsychological and mechanistic studies using neuroimaging markers to predict cognitive, emotional, and behavioural profiles in children. She also conducts intervention research focusing on parent mental health and family functioning after pediatric ABI and is working with Ontario educators to develop an accessible, user-driven ABI curriculum to better support youth with ABI in the classroom.

- ❖ **Beth Dangerfield**, BA, BEd, OCT



Beth Dangerfield is a Family Partnerships Specialist at Holland Bloorview Kids Rehabilitation Hospital, Beth co-leads the Family Leadership Program, with a specific focus on family engagement in research. Beth also provides leadership and support to Family Leaders who share their lived experience stories and is an integral part of the Client and Family Centered Care simulation-based training during new staff orientation. Beth brings her own lived experience to her role at Holland Bloorview as the mom of an 8-year-old daughter with both a rare disease and a disability and over 15 years' experience in education in the areas of language and math remediation and English as a second language. Outside of Holland Bloorview, Beth works with the rare disease foundation since 2013 and volunteers with Girl Guides of Canada.

- ❖ **Samadhi Mora Severino**, MA, PhD Student, York University



Samadhi Mora Severino is a PhD student in Health Policy & Equity at York University. She is the mother of two children - one with complex and severe disabilities. Her research focuses on disability and equity. Samadhi has a Masters in Critical Disability Studies and two undergraduate degrees in Philosophy and Anthropology. She is a Parent Partner. She has also sat on various research, provincial policy initiatives, and community work. She became interested in research in part due to her varying lived experiences with her son, but also to further understand the complex nuances of research through an ethical and equity lens.

3:10 – 3:20	Break <i>Macleod Auditorium / Stone Lobby</i>
3:20 – 4:10	Student Presentations: 7 Minute Presentations <i>Macleod Auditorium</i> <ul style="list-style-type: none"> ❖ Sex and gender differences in technology needs and preferences among informal caregivers of persons with dementia Chen Xiong, PhD Candidate ❖ Measuring balance confidence in children and teens with cerebral palsy Megan Towns, PhD Candidate ❖ Morphometry of the infant versus adult trapezius: Developmental implications Mikaela L. Stiver, PhD Candidate
4:10 – 5:00	Awards Ceremony & Wrap-up <i>Macleod Auditorium</i>
5:00 – 5:30	Networking with Reception <i>Stone Lobby</i>

Sponsorships

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Dr. Angela Colantonio, PhD, OT. Reg. (Ont.)
Professor and Director, Rehabilitation Sciences Institute

Bronze Level

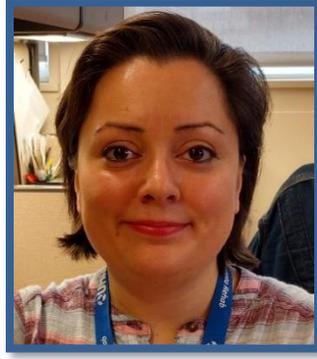


Student Oral Presenters

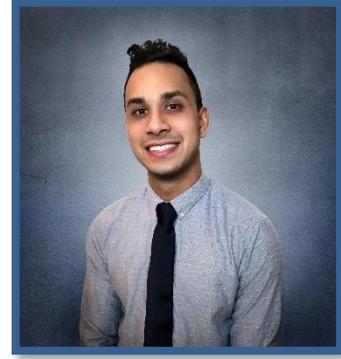
3 Minute Presenters



Sally Abudiab
MSc student



Raabeae Aryan
PhD student



Amir Boroomand-Tehrani
MSc student



Mary Boulos
MSc student



Carly Cermak
PhD candidate



Andrea D'Souza
MSc student



David Houston
MSc student



Katie Mah
PhD candidate



Tyler Saumur
PhD candidate



John Shepherd
PhD student



Janelle Unger
PhD candidate

7 Minute Presenters



Mikaela Stiver
PhD candidate



Megan Towns
PhD candidate



Chen Xiong
PhD candidate

Awards and Contests

We appreciate our sponsors and in-kind donors for making these opportunities possible.

Three Minute Presentation Competition

The top 3 presentations will win a student award.

Submit your ballot by 1:30pm! The winners will be announced at the afternoon Awards Ceremony!

Poster Competition

We have 5 student awards up for grabs:

- ❖ Best Poster – MSc
- ❖ Best Poster – PhD
- ❖ Best Poster – People’s Choice (MSc)
- ❖ Best Poster – People’s Choice (PhD)
- ❖ Best Poster – CIHR Gender, Work and Health Award

Submit your ballot by 2:15pm! The winners will be announced at the afternoon Awards Ceremony!

Social Media Contest



What better way to kick off **RSI Research Day 2019** than with a giveaway! Here how’s to win:

Step 1: Like us on [Facebook](#) **OR** follow us on [Twitter](#) (@RSIUofT) to enter.

Step 2:

- If you entered through Facebook, LIKE our #RSIResearchDay post on May 14th!
- If you entered through Twitter, all you have to do is RETWEET the #RSIResearchDay #Giveaway post!

If you already like us on Facebook or follow us on Twitter, simply proceed to **Step 2** for your chance to win!

The **deadline** to enter is **Tuesday, May 14th, 2019 at 3:00pm!**

All contest winners will be announced at the Networking with Reception event starting at 5:00pm in the Stone Lobby.

Make sure to also join the conversation by using the hashtag **#RSIResearchDay**

Good luck!

Abstracts

3 Minute Presentations

(in order of presentation)

Presentation #1 & Poster #33:

Characterization of language profiles in subacute preschool traumatic brain injury: A retrospective chart review

Carly Cermak, Bloorview Research Institute; Shannon Scratch, Bloorview Research Institute; Deryk Beal, Bloorview Research Institute.

Field of Research: Speech-Language Pathology

Funding: OGS, Kimel Graduate Student Scholarship in Paediatric Rehabilitation

Background: Little is known about the short-term language outcomes when a traumatic brain injury (TBI) occurs in early childhood during a critical period of language development. Our study aimed to characterize the language profiles of preschool aged children in the subacute stage of traumatic brain injury (TBI) as an essential step to inform long-term language trajectories of preschool TBI.

Methods: A retrospective chart review of 50 children ages 15 months to 5 years 11 months with moderate to severe TBI who received inpatient rehabilitation services between the years of 1 January 2007 to 31 December 2016 were included.

Results: Results showed that children with reported standardized assessment scores for both expressive and receptive language (n=18) had low average to average performance in both areas (85 to 100 standard score); no significant difference was found between receptive and expressive group means and no significant difference was found between language performance based on sex. Interestingly, for a small subset of children who were assessed at both admission and discharge (n=5), expressive language showed rapid improvement in as few as 2 months in comparison to receptive language that had consistently low-average scores at both time points. Many children did not have standardized assessment scores (n=23) due to age, difficulty attending to testing items, query of developmental differences (e.g. Autism Spectrum Disorder), severity of impairment, or being learners of English as a Second Language.

Summary: Early childhood TBI showed vulnerability in both receptive and expressive language areas characterized by low average test scores; this is likely an overestimate of group performance as many children were not formally testable. Future directions for tool creation for “hard to test” children and dual-language learners are discussed as well as recommendations for clinicians working with preschool children with TBI.

Presentation #2:

The effect of prolonged bed rest on balance in healthy adults: A systematic review

Tyler Saumur, Rehabilitation Sciences Institute; Sarah Gregor, Rehabilitation Sciences Institute; George Mochizuki, Department of Physical Therapy; Avril Mansfield, Toronto Rehabilitation Institute; Sunita Mathur, Department of Physical Therapy.

Field of Research: Movement Science

Funding: OGS, Peterborough KM Hunter Charitable Foundation Graduate Award

Background: Following bed rest, there are changes in the systems responsible for balance control; however, there have been heterogeneous results from studies investigating the direct effect of bed rest on balance control. Accordingly, the objective of this systematic review was to determine the effect of bed rest on balance control in healthy adults. It further aimed to determine which outcome measures, bed rest models, and countermeasures have been previously used in the context of balance following bed rest. The mechanisms responsible for balance deficits following bed rest were determined through evaluating the effectiveness of countermeasures.

Methods: Searches were conducted in six databases with the search strategy initially adapted for MEDLINE. Studies had to be conducted on healthy adults who were subjected to bed rest (greater than or equal to 5 days), with balance measures obtained before and after bed rest in order to be included. Studies that had bed rest countermeasures were also included. Risk of bias was assessed using the NIH Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies.

Results: After screening 8,897 articles, 16 were included for qualitative synthesis. The median number of participants in the included studies was 14 (range: 4-30) and the median bed rest length was 20 days (range: 5-90). Fourteen studies found decrements in at least one balance measure either compared to baseline or controls, with six studies observing impairments in > 50% of their balance measures. Of the 12 studies that included a countermeasure, three successfully offset the majority of balance deficits following bed rest using low magnitude mechanical signals, lower-body negative pressure, or a combination of balance, strength, and aerobic training. The main limitations of the studies were a lack of sample size justification and the exclusion of female participants.

Implications: The findings of this study provide evidence for bed rest negatively impacting balance control in healthy individuals. In clinical populations, these deficits may be further accentuated due to various comorbidities that impact the systems involved in balance control.

Presentation #3:

Balance confidence and fear of falling in people with incomplete spinal cord injury after balance training: A mixed methods evaluation

Janelle Unger, Rehabilitation Sciences Institute, University of Toronto; Katherine Chan, Toronto Rehabilitation Institute; Hardeep Singh, Rehabilitation Sciences Institute, University of Toronto; Avril Mansfield, Toronto Rehabilitation Institute; B. Catharine Craven, Toronto Rehabilitation Institute; Kei Masani, Toronto Rehabilitation Institute; Kristin Musselman, Toronto Rehabilitation Institute.

Field of Research: Movement Science, Rehabilitation Health Services Studies

Funding: Ontario Neurotrauma Foundation/Rick Hansen Institute, Physiotherapy Foundation of Canada Neurosciences Division

Background: Individuals with incomplete spinal cord injury (iSCI) are at an increased risk of falling; possible contributors include impaired balance, decreased balance confidence, and an increased fear of falling. Mixed methodologies allow for more meaningful and holistic data to be collected, and for participant perspectives to be taken into account. Using a mixed methods approach, we describe and evaluate how participation in Perturbation-based Balance Training (PBT) and Conventional Intensive Balance Training (CIBT) impacted self-reported balance confidence and fear of falling among adults with iSCI.

Methods: Twenty participants with chronic iSCI took part in either PBT or CIBT for eight weeks. These training programs involved individualized balance training, but PBT added repeated exposure to manual perturbations throughout each training session. Balance confidence was assessed using the Activities-specific Balance Confidence (ABC) Scale and concerns about falling were assessed using the Falls Efficacy Scale - International (FES-I). These self-report measures were completed baseline, midpoint and exit from the program. A two-way mixed ANOVA was used to determine time, group, and group-by-time interaction effects. Qualitative findings were obtained through a semi-structured interview conducted three months post training with questions targeting balance confidence and fear of falling. Qualitative data was analyzed using conventional content analysis.

Results: There were no significant group or interaction effects; however, scores on the ABC Scale ($p < 0.01$) and FES-I ($p < 0.01$) improved with time. Mean change on the ABC scale was 11.07 for PBT and 11.52 for CIBT; for the FES-I it was -4.35 for PBT and -3.70 for CIBT. These improvements were not clinically meaningful based on previously defined values; only 35% and 15% of participants achieved clinically significant changes on the ABC Scale and FES-I, respectively. In the interviews, all participants perceived improved balance confidence and the majority perceived decreased fear of falling, with no group differences.

Summary/Implications: Both balance training programs had a positive impact on balance confidence and fear of falling according to the participants. The improvements reported in the semi-structured interviews were not reflected in the changes in quantitative scores. These results highlight the importance of the mixed methodology approach, and could mean the quantitative measures are not evaluating the targeted constructs in this population.

Presentation #4:

Remotely delivered group neurorehabilitation for acquired brain injury: Feasibility and lessons learned from a newly established telerehabilitation centre

Mary Boulos, Toronto Rehabilitation Institute; Brenda Colella, Toronto Rehabilitation Institute; Liesel-Ann Meusel, Toronto Rehabilitation Institute; Lily Miguel-Jaimes, Toronto Rehabilitation Institute; Michelle Panozo, Toronto Rehabilitation Institute; Robin Green Toronto, Rehabilitation Institute.

Field of Research: Social and Cognitive Rehabilitation, Rehabilitation Health Services Studies

Funding: Walter & Maria Schroeder Institute for Brain Innovation and Recovery, CIHR

Background: In Canada, ABI is a leading cause of chronic, persisting disability. Previous research shows deterioration of cognition, mood, and brain structures over time. However, long-term access to ABI support is limited, especially for those in remote areas, with mobility restrictions, and/or financial difficulties. Ongoing, accessible neurorehabilitation is needed. Our lab established an acquired brain injury (ABI) clinical-research centre. The purpose of this pilot project was to evaluate the feasibility of remotely delivering group cognitive and psychological therapies to ABI patients across the province.

Methods: Inclusion criteria consists of: prior history of ABI; no current cognitive/psychological therapies; basic computer literacy; English fluency; no active psychosis or aphasia. Therapies are delivered in group format via secure videoconferencing. Based on their clinical needs, patients receive any/all of the following therapies adapted for ABI: cognitive behavioural therapy (CBT), goal management training (GMT), relaxation & mindfulness-based skills (RMS). To assess feasibility, we examined recruitment, retention, and adherence. Patients were surveyed and interviewed about their therapy and technology satisfaction.

Results: Over a one year period, 177 patients living with ABI have been referred to the program. Ninety three patients were screened for program eligibility, 78 completed the intake assessment, and 53 began therapy. Thirteen groups were completed: 3 CBT (n=14), 5 GMT (n=25), and 5 RMS (n=23). Retention (85.1%) and therapy adherence (74.4%) were high across all groups. Therapies were reported to be very relevant (66.1%), adequate in information density (77.8%), and easy to understand (83.9%). At times, technical difficulties and patient absences disrupted the therapy sessions. Patients remarked the program improved their social interaction, mood, stress tolerance, and quality of life.

Summary/Implications: Remotely delivered group therapy for ABI demonstrated adequate feasibility. Patients remarked on benefits of group component of therapy and requested further opportunities for social interaction, underscoring the value of group (vs. one-to-one). Added technical support and improved telecommunication software would improve the therapy experience. Through adoption of remote therapy delivery, clinicians can improve the accessibility and scalability of ongoing neurorehabilitation.

Presentation #5:

(Co)Constructing concussion with children: A critical qualitative exploration of drawings of concussion

Katie Mah, Rehabilitation Sciences Institute, University of Toronto; Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital; Brenda Gladstone, Dalla Lana School of Public Health, University of Toronto; Centre for Critical Qualitative Health Research, University of Toronto; Nick Reed, Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital; Rehabilitation Sciences Institute, University of Toronto; Department of Occupational Science and Occupational Therapy, University of Toronto.

Funding: Kimel Family Graduate Student Scholarship in Paediatric Rehabilitation, Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital

Background: It is increasingly recognized that children possess unique insights into health topics and have the capacity to share these insights. However, in the body of knowledge concerning childhood concussion, children's perspectives are rarely sought. This inadequate representation of children's perspectives has resulted in an incomplete knowledge base from which to inform clinical practice. Using a research orientation that values first-hand accounts and methods that encourage different knowledge than has traditionally been sought, the objective of this research is to explore how children conceptualize concussion.

Method: In this critical qualitative arts-based study, drawing is used as an adjunct to traditional interviewing methods to generate data with children 6-18 years of age. Those with no history of concussion completed a drawing in response to the phrase "when I hear the word concussion." Those with a history of concussion completed two drawings: one in response to the phrase "before I had my concussion" and another in response to the phrase "now." Children then participated in a semi-structured interview to explain their drawing. Interview data was recorded and transcribed. Analysis is guided by an adapted critical visual methodology informed by the work of Rose and Guillemin.

Results: Preliminary analysis of drawing and interview data represents varied discourses wherein concussion is understood as a widespread phenomenon with serious and sometimes fatal consequences that is indiscriminate, yet preventable. The word "concussion" evokes a sense of fear in children, even those who lack a basic understanding or experience of the injury. While every young person is at risk of concussion, certain "irresponsible" children are at increased risk. Analysis is framed within the work of Foucault, focusing on how risk discourse is negotiated and resisted by children in their everyday lives.

Implications: The accounts of children are notably absent from the childhood concussion knowledge base. When enabled by a research orientation that privileges first-hand accounts and methods that enable the conveyance of abstract concepts, children are capable of contributing unique insights regarding how they understand concussion: as a sweeping phenomenon that all children are at risk for and that should be feared. Such insights can enable the development of public health initiatives and clinical practices targeted to the specific educational and support needs of children.

Presentation #6 & Poster #34:

The gendered experiences of men with traumatic brain injury (TBI): A qualitative study

Andrea D'Souza, Rehabilitation Sciences Institute, University of Toronto; Alexis Fabricius, KITE Toronto Rehab, University Health Network; Vanessa Amodio, KITE Toronto Rehab, University Health Network; Halina Haag, Faculty of Social Work, Wilfrid Laurier University; Heather Colquhoun, Department of Occupational Science and Occupational Therapy, University of Toronto; John Lewko, Centre for Research in Human Development, Laurentian University; Enrico Quilico, Rehabilitation Sciences Institute, University of Toronto; Patrick Archambault, Department of Family Medicine and Emergency Medicine, Université Laval; Tatyana Mollayeva, Acquired Brain Injury Research Laboratory, University of Toronto; Angela Colantonio, Rehabilitation Sciences Institute, University of Toronto.

Field of Research: Practice Science, Rehabilitation Health Services Studies

Funding: CGS M (CIHR), CIHR Institute of Gender and Health

Background/Purpose: Evidence suggests that gender-related concepts influence traumatic brain injury (TBI) outcomes, such as return-to-work and use of healthcare resources. These concepts are also related to the success of clinical interventions, and thus need to be considered in the implementation of therapies for patients with TBI. The current study is funded by the Canadian Institutes of Health Research, and aims to address this issue by exploring the experiences of men with TBI through a gendered lens. We aimed to (1) analyze men's gendered perceptions and behaviours in relation to TBI recovery; (2) understand how men view gender roles and expectations; and (3) explore how these perceptions and behaviours can inform future gender-sensitive educational materials.

Methods: We conducted semi-structured interviews with men who were diagnosed with TBI of any severity, and who were either in the acute (<three months post-injury) or chronic (>three months post-injury) phases of TBI. We excluded non-English speakers, and those with impairments that may have impeded participation. The final sample consisted of 12 acute and 10 chronic participants. An inductive, latent and constructionist thematic analysis was used to interpret interview data. Gender theory with a focus on hegemonic masculinity was used as a guiding theoretical framework.

Results: We discerned three themes, including the performance of masculinity in recovery, motivations for return-to-work, and explicit and implicit understandings of gender. Participants demonstrated masculine behaviours, such as downplaying injury severity and pushing for more physical rehabilitation, in their treatment. Several discussed the importance of return-to-work and related motivations, including the maintenance of gendered household roles, or personal and professional identity. When asked about their understanding of gender, many tended to conflate concepts of sex, gender and sexuality, with little explicit acknowledgement of the impact of gender roles and expectations on recovery.

Summary/Implications: These results will inform patient-driven educational materials that will be developed and piloted in the upcoming year. This may include the reframing of goals and therapies as more "masculine", and the use of men's motivations to inform goal-setting and planning of alternative activities. Men's understanding of gender and reactions to discussion about gender can be used to strategically inform development of approachable gender-sensitive materials.

Presentation #7:

Visual feedback balance training with functional electrical stimulation: Impact and perspective of individuals with incomplete spinal cord injury

David Houston, Rehabilitation Sciences Institute, University of Toronto; Janelle Unger Rehabilitation Sciences Institute, University of Toronto; Jae Lee, Institute of Biomaterials and Biomedical Engineering, University of Toronto; Kei Masani, KITE, Toronto Rehab-University Health Network; Kristin Musselman, KITE, Toronto Rehab-University Health Network.

Field of Research: Movement Science, Rehabilitation Technology Science

Funding: University of Toronto EMHSeed Program

Background/Purpose: Balance is an integral component of many daily activities. Individuals with motor incomplete spinal cord injuries (iSCI) exhibit significant balance deficiencies which increase their risk of falling. While these individuals often remain ambulatory within their own homes, improving their balance may lead to greater functional independence in the community. Previous works have demonstrated the effectiveness of visual feedback balance training (VFBT) to significantly improve static and dynamic stability. Applying functional electrical stimulation (FES) to the ankle plantarflexors has also been shown to exhibit a positive effect on static stability through a reduction in centre of pressure (COP) sway. We developed a novel system combining FES with VFBT (FES+VFBT) as a therapeutic tool for individuals with iSCI. This study sought to understand participants' perspectives on the impact of FES+VFBT on their activities of daily living, balance confidence, and risk of falling.

Methods: Five participants (1M, 4F; 62.4 (4.4) years) with chronic, iSCI completed 4-weeks of FES+VFBT. Each participant attended twelve 1-hour training sessions (3/week) where FES was applied bilaterally to the ankle plantarflexors and dorsiflexors during VFBT exercises. Two semi-structured interviews were conducted over the phone or in person at 2-3 days and eight weeks following the final training session. Interviews were transcribed verbatim with themes and categories identified through conventional content analysis.

Results: Three themes were identified: 1) Functional Goals: Participants wanted to improve their balance in order to improve their walking ability. They expressed a desire to continue in the program as this goal was not fully realized. 2) Perceived Improvements: Participants reported increased body awareness and greater muscle activation, strength, and endurance resulting in greater stability. Participants felt that they were still improving at the end of the intervention. 3) Balance Confidence: Participants exhibited greater comfort completing household tasks and an increased willingness to try new activities despite feeling no change in fall risk.

Summary/Implications: Improved physical functioning, body awareness and increased balance confidence were reported as benefits of FES+VFBT. Despite their improvements, the participants felt they possessed the capacity to further increase their abilities.

Presentation #8:

Test-retest reliability of frequency-domain measures of balance among people with sub-acute stroke

Raabeae Aryan, Rehabilitation Sciences Institute, University of Toronto; Andrew H. Huntley, KITE, Toronto Rehabilitation Institute, University Health Network; Elizabeth L. Inness, KITE, Toronto Rehabilitation Institute, University Health Network; Kara K. Patterson, Department of Physical Therapy, University of Toronto; George Mochizuki, Rehabilitation Sciences Institute, University of Toronto; Avril Mansfield KITE, Toronto Rehabilitation Institute, University Health Network.

Field of Research: Movement Science Rehabilitation Technology Science

Funding: CPSR, Queen Elizabeth II Graduate Scholarship, Peterborough K.M. HUNTER Charitable Foundation Graduate Awards (OSOTF), Unilever/Lipton Graduate Fellowships in Neurosciences, University of Toronto Graduate Student Fellowship

Background: Spectral analysis of force plate time series is usually used to understand relative contributions of different sensory systems to balance control. Determining the dominant sensory systems for balance tasks may better inform stroke rehabilitation. Although the reliability of a few force plate-based balance measures have been reported in stroke, the reliability of the frequency-domain measures have yet to be established within the sub-acute stage of stroke. In this stage, patients are receiving intensive rehabilitation, and their status may change quickly. Therefore, in the present study we aimed to determine the test-retest reliability of frequency-domain measures of balance in sub-acute stroke.

Methods: Participants with sub-acute stroke (age= 61.0±12.6 years; time post stroke= 39.9±21.6 days) completed 2 quiet standing trials in one session (average time between trials= 11.2 minutes). Participants were asked to stand as still as possible with each foot placed on one of two adjacent force plates, with eyes open for 30s. Ground reaction forces and moments were collected at 256Hz, and centre of pressure (COP) under each foot separately and under both feet combined was calculated offline. The following spectral measures were calculated from the COP time-series for the frequency range of 0-4.0 Hz: medio-lateral (ML) and anterior-posterior (AP) mean power frequencies, median power frequencies (ML & AP), and 80% and 95% power frequencies (ML & AP). Test-retest reliability was calculated using ICC3,1 and 95% confidence intervals. Reliability values <0.5, between 0.5 and 0.75, between 0.75 and 0.9, and >0.90 were considered as poor, moderate, good, and excellent, respectively.

Results: Moderately reliable COP-measures, under both feet combined, were 0.63 [0.32-0.82] for AP-95% power frequency, 0.60 [0.27- 0.80] for AP-mean power frequency, 0.58 [0.24-0.79] for ML-mean power frequency, 0.58 [0.25-0.79] for ML-95% power frequency, 0.52 [0.16-0.75] for AP-80% power frequency, and 0.50 [0.14-0.74] for ML-80% power frequency. Poor measures of reliability were found to be 0.46 [0.10-0.72] for AP-median power frequency, and 0.45 [0.07-0.71] for ML-median power frequency.

Conclusions: Frequency-domain measures of balance have poor-to-moderate test-retest reliability among people with sub-acute stroke which would limit clinical interpretation. Spectral analysis of the COP time-series of more and less affected legs will also be presented at the conference.

Presentation #9:

Identifying cases of spinal cord injury in an Ontario database of primary care electronic medical records

John Shepherd, University of Toronto; Karen Tu, University of Toronto; Cathy Craven, Toronto Rehabilitation Institute; Rahim Moineddin, University of Toronto; Susan Jaglal, University of Toronto.

Field of Research: Rehabilitation Health Services Studies

Background: Spinal cord injury (SCI) affects a small population but results in substantial health care utilization due to the medical complexity of the population and long disease duration. The basic epidemiology of SCI is not well understood and the disease definition has evolved to include non-traumatic causes. Currently, little information exists on the longitudinal course of SCI and the increasing availability of information from clinical records offers an opportunity to fill this gap.

Methods: An initial keyword search of all eligible records in EMRald was conducted using 148 search terms from the literature to identify possible cases of SCI. A random sample of 48,000 patients was selected, containing 803 possible cases which were reviewed using a structured chart review process to determine if they are in fact cases. Results were audited by a second reviewer and uncertain cases were referred to senior clinical experts for adjudication. 126 validated cases of SCI were identified and this reference cohort was used to develop and test potential algorithms.

Results: The keyword search and chart review process can be used to identify a validated cohort of definite SCI cases. The reference standard cohort resembles samples of the SCI population in the literature with respect to prevalence, age, sex, and type of injury. The optimal algorithm has good performance, with sensitivity of 70.6%, positive predictive value of 89.9%, and F-score of 79.1%.

Implications: Use of a maximally sensitive algorithm, with subsequent manual review, can ensure more comprehensive cohort selection within EMRald. Once identified, this cohort can be linked with administrative data such as billings and hospital discharge reports to study longitudinally the health status and health care utilization of this population.

Presentation #10 & Poster #35:

Unexpected pattern of longitudinal recovery in moderate-severe traumatic brain injury using measures of reaction time inconsistency

Sally Abudiab, Rehabilitation Sciences Institute; Robin Green, Toronto Rehabilitation Institute.

Field of Research: Social and Cognitive Rehabilitation Practice Science

Funding: ONF-REPAR

Background Reaction time inconsistency (RTI), a measure of intra-individual variability, is sensitive to the chronic effects of moderate-severe traumatic brain injury (mod-sev TBI). However, our understanding of intra-individual longitudinal change in RTI following mod-sev TBI is limited. Objective To compare longitudinal changes across a variety of reaction time (ex-Gaussian) and inconsistency indices at two time windows (2 to 5 months and 5 to 12 months post-injury) on a choice reaction time task (CRT).

Methods This secondary analysis of 79 adult participants with mod-sev TBI from the Toronto TBI Recovery Study database employed complete CRT datasets spanning the two time windows. Ex-Gaussian parameters μ and σ (measures of psychomotor speed), and τ (extremely slow responses) were computed, as well as two inconsistency indices: intraindividual standard deviation (ISD; absolute variability) and intraindividual coefficient of variation (ICV; relative variability). A repeated-measures MANOVA was employed.

Results Psychomotor speed (on ex-Gaussian μ) did not improve in the early time window (from 2-5 months) but trended towards significance from 5 to 12 months ($p=0.07$). Changes on ex-Gaussian σ and τ were not observed across either time window. Interestingly, while ICV did improve from 2-5 months ($p < 0.05$) and not 5-12 months –consistent with a typical pattern of cognitive recovery– the reverse was found for ISD, where there was no initial improvement from 2-5 months but significant improvement from 5-12 months ($p < 0.05$).

Summary Using less conventional markers of intra-individual variability in mod-sev TBI, recovery was different than expected. Instead of rapid early recovery, RTI showed evidence of delayed recovery. RTI markers of intra-individual variability underscore the need for ongoing therapeutic intervention beyond the early injury phase. RTI may have practical implications for patients, particularly in safety-critical situations.

Presentation #11:

The effects of virtual reality-induced postural threat on performance of a walking balance task

Amir Boroomand-Tehrani, Toronto Rehabilitation Institute; Andrew Huntley, Toronto Rehabilitation Institute; David Jagroop, Toronto Rehabilitation Institute; Jennifer Campos, Toronto Rehabilitation Institute; Kara Patterson, Toronto Rehabilitation Institute; Luc Tremblay, Faculty of Kinesiology and Physical Education, University of Toronto; Avril Mansfield, Toronto Rehabilitation Institute.

Field of Research: Movement Science Rehabilitation Technology Science

Funding: Natural Sciences and Engineering Research Council of Canada

Background/Purpose: Rapid motor learning may occur in situations where injuries are a consequence to making a motor error. Perceived threat may stimulate the body to mobilize resources to optimize motor performance and shift attention to the most vital information. These adaptive reactions may lead to more errorless practice, potentially facilitating the rapid motor learning that is observed in threatening situations. As a first step towards understanding the role of perceived threat on motor learning, the purpose of this study is to determine if performance of a balance task is affected by different levels of perceived threat. We hypothesized that perceived threat of injury introduced within a virtual environment (VE) will result in improved motor performance in a balance beam walking task (i.e., higher frequency of successful steps and reduced trunk movement variability).

Methods: In this study, healthy young adults were asked to walk on a beam under 3 conditions: 1) low-threat real environment (RE); 2) low-threat VE; and 3) high-threat VE. Threat was introduced by virtually simulating a balance beam elevated over heights that appear to be dangerous. Performance was evaluated by assessing frequency of successful steps. Physiological arousal and state anxiety were characterized using electrodermal responses and questionnaire scores in order to evaluate the intended effect of increasing perceived threat in a VE.

Results: The data suggests that step success was higher in the high-threat VE (median (M)=55.2%) than the low-threat VE (M=48.3%). Although electrodermal responses were similar between low-threat and high-threat conditions (M=0.12 \hat{I} %S, 0.10 \hat{I} %S, and 0.11 \hat{I} %S in the RE, low-threat VE, and high-threat VE, respectively), state anxiety scores were greatest in the high-threat VE (M=43, 49, and 56 in the RE, low-threat VE, and high-threat VE, respectively), providing support that our methods were sufficient to induce perceived threat.

Summary/Implications: Higher perceived threat appears to optimize walking balance performance. Differences in performance and state anxiety between the 2 low-threat environments may indicate a need for design improvement and/or reflect inherent differences between virtual reality (VR) and real-environment walking. These findings can provide guidance for similar studies, as well as studies that investigate the effects of threat on long-term motor learning.

7 Minute Presentations

(In the order of presentation)

Presentation #1 & Poster #36:

Sex and gender differences in technology needs and preferences among informal caregivers of persons with dementia

Chen Xiong, Rehabilitation Sciences Institute, University of Toronto; Bing Ye, Toronto Rehabilitation Institute-University Health Network; Alex Mihailidis, Rehabilitation Sciences Institute, University of Toronto; Jill Cameron, Rehabilitation Sciences Institute, University of Toronto; Arlene Astell, Rehabilitation Sciences Institute, University of Toronto; Emily Nalder, Rehabilitation Sciences Institute, University of Toronto; Angela Colantonio, Rehabilitation Sciences Institute, University of Toronto.

Field of Research: Rehabilitation Technology Science, Rehabilitation Health Services Studies

Funding: Canadian Institutes of Health Research, Health Canada

Background/Purpose: Dementia is a major public health concern associated with significant caregiver demands and there are technologies available to assist with caregiving. However, there is a paucity of information on caregiver needs and preferences for these technologies, particularly from a sex and gender perspective. To address this gap in research, the objectives of this study are to examine (1) the knowledge of technology, (2) perceived usefulness of technology, (3) feature preferences when installing and using technology and (4) sex and gender influences on technology needs and preferences among family caregivers of persons with dementia (PwD) across North America.

Methods: A secondary analysis was conducted on an existing cross-sectional survey with family caregivers of PwDs residing in Canada or the USA. Respondents were recruited through the Alzheimer Society of Canada, the Victorian Order of Nurses and Adult Day Programs and other Canadian health care provision institutes. Descriptive statistics, bivariable and multivariable analyses were used to describe the study sample, uncover differences between male and female caregivers and examine sex and gender influences on caregivers' technology needs and preferences.

Results: A total of 381 eligible responses were received over a nine month data collection period. The majority of respondents did not know much about and had never used any technologies to assist with caregiving. Being easy to install, easy to learn how to use and cost were identified as the most important features when purchasing and setting up technology, while reliability was identified as the most important feature when using technology. Most respondents were willing to pay up to \$500 to acquire individual technologies. Controlling for other socio-demographic variables, female respondents were more likely to have some knowledge about technology for caregiving while male respondents were more willing to pay higher amounts for these technologies compared to their female counterparts.

Summary/Implications: As the first study of its kind, our findings represent a step towards the incorporation of sex and gender considerations such as cost and reliability in technology design and promotion for caregivers. Future efforts are warranted to establish an in-depth understanding of sex and gender influences in relation to other social and environmental factors.

Presentation #2:

Development of a new measure of balance confidence for youth with cerebral palsy: The Feelings About Balance - Cerebral Palsy Questionnaire

Megan Towns, Rehabilitation Sciences Institute, University of Toronto; Kelly Arbour-Nicitopoulos, Faculty of Kinesiology and Physical Education, University of Toronto; Sally Lindsay, Bloorview Research Institute; Avril Mansfield, Toronto Rehabilitation Institute; Virginia Wright, Bloorview Research Institute.

Field of Research: Practice Science

Funding: Holland Bloorview Chair in Paediatric Rehabilitation

Background/Purpose: Participation in physical activities enhances social interaction and life satisfaction. Youth who have cerebral palsy (CP) often have lower participation in physical activity than typically-developing (TD) peers. Balance confidence is an important predictor of physical activity participation in adults with physical disabilities but has not been studied in youth, partly because there are no psychometrically-sound pediatric measures of balance confidence. This study's goal was to develop and pilot test a measure of balance confidence (Feelings About Balance - Cerebral Palsy [FAB-CP]) for youth with CP who walk independently with (Gross Motor Function Classification System Levels [GMFCS] III) and without (GMFCS I-II) gait aids.

Methods: Youth with CP (n=8), TD youth (n=8), and parents of youth with CP (n=8) were interviewed to explore their/their child's balance and related challenges during physical activity participation. Potential FAB-CP items were extracted via qualitative content analysis, and reviewed/reduced via e-survey by 31 health care professionals (HCP) who work with children with CP. Youth with CP (n=4) and TD youth (n=4) pilot tested the FAB-CP, including response scale options and general format, and rated selected items on importance and level of confidence, allowing further reduction. Their feedback informed final modifications.

Results: The 131 items initially generated were reduced to 20 after HCP review, and 11 after youth ratings. Youth in GMFCS III rated items differently than other youth in terms of importance and confidence. Items are depicted in a first-person perspective video viewed before the youth rates balance confidence (0-100 scale). This format and response scale was preferred by youth over other options, and was used suitably during pilot testing. Four open-ended questions were added to the end of the FAB-CP to facilitate conversation between the HCP and youth on factors influencing balance confidence on any given item(s).

Summary/Implications: Different rating of items by youth who require gait aids (GMFCS III) suggested the FAB-CP could not effectively target all youth. Thus, we built the 11-item FAB-CP to directly apply to youth in GMFCS I and II. Work is underway now to test the reliability and validity of the FAB-CP. Its format allows completion from home and automatic scoring. Information obtained from open-ended questions further improves clinical utility, which should support more individualized and comprehensive treatment goals and interventions.

Presentation #3:

Morphometry of the infant versus adult trapezius: Developmental implications

Mikaela L. Stiver, Rehabilitation Sciences Institute, University of Toronto; Luke R. Bradshaw, Department of Anatomy with Medical Imaging, Faculty of Medical and Health Sciences, University of Auckland; Ethan M. Breinhorst, Department of Anatomy with Medical Imaging, Faculty of Medical and Health Sciences, University of Auckland; Ali Mirjalili, Department of Anatomy with Medical Imaging, Faculty of Medical and Health Sciences, University of Auckland; Anne M. R. Agur, Rehabilitation Sciences Institute, University of Toronto.

Field of Research: Movement science

Funding: Canada Vanier Canada Graduate Scholarship (CIHR)

Background/Purpose: The 3D morphometric and architectural complexity of the human trapezius has only recently begun to be examined and quantified using *in vivo* and cadaveric approaches. While most research has focused on adults, the functional involvement of the trapezius changes considerably throughout post-natal development and adulthood. The purpose of this study was to quantify and compare the comprehensive 3D architecture of trapezius between infancy and adulthood using cadaveric digitization and computer models.

Methods: Fibre bundles from the trapezius muscles of two lightly-embalmed female cadavers (6 months and 72 years) were serially dissected, digitized (MicroScribe[®] G digitizer), quantified, and modelled (Autodesk[®] Maya[®]) throughout the entire muscle volume. Architectural parameters, including physiological cross-sectional area (PCSA), muscle volume (MV), and fibre bundle length (FBL), were computed and compared between functional muscle partitions (descending, transverse, and ascending) and proportionally between the infant and adult specimens.

Results: Significant architectural differences were found when comparing functional partitions within each muscle: the transverse partition consistently had the shortest mean FBL but accounted for over 50% of the whole muscle PCSA. Comparison between the infant and adult muscles revealed distinctly different patterns in FBL range, PCSA, and MV.

Summary/Implications: Changes in proportional architectural parameters between infancy and adulthood appear to coincide with primary functional roles of the trapezius at each timepoint. Clinically, a better understanding of post-natal trapezius development could help guide therapeutic approaches for chronic muscle pathology.

Poster Abstracts

Poster #1:**Using expert consensus to develop a tool to evaluate physical therapists' knowledge, skills and judgement related to the performance of airway suctioning**

Erin Miller, Rehabilitation Science Institute, University of Toronto; Dina Brooks, School of Rehabilitation Science, McMaster University; Brenda Mori, Department of Physical Therapy, University of Toronto.

Field of Research: Practice Science

Funding: The Canadian Lung Association Breathing as One Allied Health Fellowship, the Cardiorespiratory Division Scholarship - Canadian Physiotherapy Association, administered by the Physiotherapy Foundation of Canada, OGS

Background/Purpose: The inability to effectively clear pulmonary secretions can impair ventilation and adequate oxygenation. Suctioning is one technique used by health care professionals to help manage secretion retention and maintain the integrity of an individual's airway. Because suctioning has the potential to cause serious adverse effects, it is important to ensure the competency of health care professionals who perform this technique. A number of tools have been developed to address the assessment of competency related to the performance of suctioning; however, they lack relevance to current physiotherapy practice in Canada. Therefore, the purpose of this study was to develop a tool assess physical therapists' knowledge, skills and judgement related to the performance of airway suctioning with intubated and non-intubated adults.

Methods: A modified Delphi methodology was used to guide the development of the tool and to evaluate its sensibility (i.e. common-sense nature). Participants included experienced cardiorespiratory physical therapists (PTs) who perform airway suctioning and PTs employed in academic positions related to cardiorespiratory physical therapy at Canadian universities. Round 1 focused on the refinement of factors to include in the tool, Round 2 focused on the finalization of items and Round 3 focused on the evaluation of a preliminary version of the tool.

Results: A total of 34 individuals participated in Round 1, 30 participated in Round 2 and 25 participated in Round 3. A literature review identified 11 relevant domains and 69 supporting competencies. In Round 1, consensus of agreement was achieved for all domains; however, it was borderline for the professionalism domain, with multiple participants suggesting it was redundant as it is a global requirement for all PTs. Consensus of agreement was also achieved for 59/69 supporting competencies, while 5 achieved borderline consensus and 5 failed to reach consensus. In Round 2, participants rated a series of recommendations related to items requiring further consideration, as well as 9 new items suggested by participants in Round 1. In Round 3, the preliminary tool was found to be globally sensible but concerns were expressed about the inclusion of redundant factors and the tool's length. The tool was revised accordingly.

Summary/Implications: The final round sensibility questionnaire provided preliminary evidence of the tool's face and content validity. We will investigate the tool's measurement properties in a future study.

Poster #2:

Caregiver-identified phases of Alzheimer's disease caregiving

Kristina Kokorelias, Rehabilitation Sciences Institute; Monique AM Gignac, Institute for Work & Health; Gary Naglie, Baycrest Health Sciences; Jill Cameron, Occupational Science & Occupational Therapy, University of Toronto.

Funding: Toronto Rehabilitation Sciences Institute, Factor Inwentash Faculty of Social Work, Institute for Life Course & Aging

Field of Research: Rehabilitation Health Services Studies, Occupational Science

Background: Informal (unpaid) family caregivers for individuals with Alzheimer's disease are at high risk for developing cognitive, affective, and physical health consequences. Available caregiver supports and services are inconsistently effective, which may be due to poorly timed delivery within the disease trajectory. While clinical phases of the disease are known, caregiver-identified phases across the disease trajectory are not. Caregiver phases can help us better understand the caregiver experience and can be used to provide timely supports to enable better quality of life for both the caregiver and care recipient. The objective of this study was to determine the caregiver-identified phases of caregiving throughout the Alzheimer's disease trajectory and the corresponding needs for support and information.

Method: Constructivist grounded theory (CGT) informed data collection, analysis, and interpretation. 40 spousal and adult children caregivers to persons with Alzheimer's disease (10 husbands, 10 wives, 10 daughters, 10 sons) were purposely recruited and interviewed using a semi-structured interview guide. Sampling was completed when theoretical saturation was achieved. Data analysis was conducted using a constant comparative analysis technique.

Results: Participants described the phases of caregiving as initial symptoms, diagnosis, assistance with instrumental activities of daily living, assistance with activities of daily living and future preparation. Support and information needs included more information about the symptoms of cognitive impairment in relation to those of normal aging, navigation around resources, understanding clinical phases of the illness and what to expect, social support, support with physical care provision and support for accessing long term care placement. Lastly, changing perceptions of health care interactions emerged as being important to understanding the caregiving experience.

Summary/Implications: Caregivers identified 5 distinct phases across the Alzheimer's disease trajectory. They also discussed their core needs for support and how these needs change corresponding to the caregiving phases. Findings can be used to inform the development, evaluation, and implementation of programs and services to meet the changing needs of dementia caregivers.

Poster #3:**The effect of cycling on the rehabilitation process following lower extremity musculoskeletal surgical procedures: A systematic review**

Analyssa Cardenas, University of Toronto; Marina Nikolopoulos, Bloorview Research Institute; Darcy Fehlings, Bloorview Research Institute.

Field of Research: Movement Science, Rehabilitation Technology Science

Funding: Centre for Leadership (Holland Bloorview)

Background: Cycling after hip or knee replacement is effective in reducing muscle spasms and improving range of motion. However, cycling is not routinely used as rehabilitation in all lower extremity surgeries. There is a need to summarize findings on cycling as rehabilitation after lower extremity musculoskeletal surgeries to better understand the strength of the evidence and how cycling may reduce pain, improve gross motor function, and improve muscle strength.

Purpose: The purpose of this study is to critically appraise and synthesize the literature regarding the use of cycling initiated within 3 months post-surgery in inpatient rehabilitation after lower extremity musculoskeletal surgeries on outcomes such as pain, gross motor function, and muscle strength.

Methods: A computer-assisted literature search was conducted on inpatient cycling following lower extremity musculoskeletal surgical procedures. The search strategy was used for MEDLINE, EMBASE, CINAHL, and Cochrane Reviews. Inclusion criteria included: English, published in a peer-reviewed journal, randomized control trial, case-control trial, or meta-analysis, at least 10 participants, and published in 1945-present. Titles and abstracts were independently reviewed by 2 reviewers, using DistillerSR. The full text of potentially eligible studies were then retrieved and independently assessed by 2 reviewers. A standardized form will assess study quality and evidence synthesis. Evidence tables will depict study design, participant demographics, surgery type, intervention details, adverse events, and outcome measures. Outcomes will be categorized based on the International Classification of Functioning, Disability, and Health (ICF). The articles will be categorized into 4 classes of evidence outlined by the American Academy of Neurology (AAN) and risk of bias will be assessed using the PEDro scale. 3758 titles and abstracts and 438 full texts were screened in total.

Results: Currently, 21 full texts have been included and contain 16 studies with participants after knee surgery, 2 after hip surgery, and 3 with knee and hip surgery. Data extraction and risk of bias assessment is currently being completed. This review was developed according to the 2017 Clinical Practice Guideline Process Manual of the AAN and the 2009 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist.

Implications: This study will provide an analysis of the literature for inpatient rehabilitation cycling following lower extremity musculoskeletal surgeries.

Poster #4:

Exploring the impacts of motion-based technology on balance, movement confidence, and cognitive function of people with cognitive impairment

Erica Dove, University of Toronto; Arlene Astell, University of Toronto.

Field of Research: Rehabilitation Technology Science, Social and Cognitive Rehabilitation

Funding: AGE-WELL NCE

Background/Purpose: Participation in physical activity (PA) programs can benefit people with cognitive impairment (PCI; e.g. dementia) but many PA programs are passive, unengaging and repetitive, resulting in poor engagement and long-term adherence. The potential of integrating motion-based technologies (MBT; e.g. Xbox Kinect) into PA programs is being explored to encourage PA participation in PCI. However, the impacts on key variables including balance, movement and cognitive function have yet to be determined. This study aims to examine the impacts of a group MBT intervention (Xbox Kinect bowling) for PCI on balance, movement confidence and cognitive function.

Methods: This within-participants design includes measurement at pre- and post-intervention. Twenty PCI will be recruited from two adult day programs in Durham Region, ON. At pre-test, participants will complete a demographic survey, the Mini Balance Evaluation Systems Test (Mini-BEST) and the Montreal Cognitive Assessment (MoCA). Participants will play an Xbox Kinect bowling game in a group setting, twice per week for ten weeks (20 sessions). Participants will be video-recorded during the first, mid-point, and final sessions to capture their physical movements (e.g. flow of movement) during the MBT activity. Following the intervention, the Mini-BEST and MoCA will be repeated.

Results: Quantitative data collected through the Mini-BEST, coded video recordings and the MoCA will be compared from pre- to post-test using paired t-tests. An ANCOVA with post hoc analyses will also be performed to account for covariates (e.g. number of intervention sessions attended).

Significance: The MBT intervention has the potential to positively impact participants' physical function, specifically balance (score on the Mini-BEST) and movement confidence (coded from video recordings). This will confirm the feasibility and potential benefits of using MBT to deliver PA to PCI. There is also the potential for the MBT intervention to positively impact the cognitive function of PCI (as measured through MoCA score). This work can be used as the basis for developing both specific software and future MBT-based PA programs for PCI. Additionally, the results of this study can encourage the inclusion of PCI in forthcoming research and rehabilitation endeavors.

Poster #5:

Exploring the pediatric volition among children with autism in an adapted robotics program

Sukyong Hong, Bloorview Research Institute; Sally Lindsay, Bloorview Research Institute.

Field of Research: Social and Cognitive Rehabilitation

Funding: Canada Graduate Scholarship Master's (CGS-M), Ontario Ministry of Research and Innovation

Background: Play is crucial for children's development. Children with autism spectrum disorder (ASD) often have less opportunities to participate in play with typically developing children because of children with ASD's repetitive play behaviors and preference to play by themselves. One promising play-based intervention is through LEGO® robotics which embeds technology into a playful activity.

Objective:

- a. To understand whether pediatric volition among children with ASD participating in an adapted robotics program changes before and after engagement in the program.
- b. To explore how distractions change among children with ASD during an adapted robotics program.

Methods: This study used a mixed method design with video recorded and structured observations of each workshop (6 workshops, 2 hours each). Two major measurements were used in this study-pediatric volitional questionnaire (PVQ) and distraction template. PVQ is designed to assess children's inner motivation, whereas, distraction template is developed to measure number of distractions during the activity. Paired-sample t-test were used to assess differences in pediatric volition between time 1 and time 2. The sample involved 2 groups (e.g., group1 and group2) consisting of 14 youth aged 6-9 with autism.

Analysis: The workshop data (i.e., video recordings and observations) were reviewed and assigned scores of particular characteristics using PVQ and distraction template. Quantitative data were entered into SPSS, and qualitative data were analyzed through a content analysis. Paired-sample t-test were used to assess differences between time 1 and time 2.

Results: The pediatric volition scores showed a statistically significant decrease in group 1's score from time 1 to time 2. No statistically significant increase was found in group 2. The number of distractions significantly decreased for both groups from the beginning to the end of the program. From qualitative observations, participants decreased their pediatric volition sub-scores due to asking too many questions, refusing to complete the task, or losing focus. On the other hand, participants moved around and showed a lot of distracted behaviors during workshop 1, whereas, no moving and less distracted behaviors were observed during workshop 5.

Contribution: This research will inform the exploration of play and technology-based interventions for children with disabilities to enhance their interest in STEM (Science, Technology, Engineer, and Math) and higher education and employment.

Poster #6:

Let's boogie: Feasibility of a dance intervention in patients with chronic obstructive pulmonary disease

Adnan Wshah, University of Toronto; Stacey Butler, West Park Healthcare Centre; Kara Patterson, University of Toronto; Roger Goldstein, West Park Healthcare Centre; Dina Brooks, University of Toronto.

Field of Research: Movement Science

Funding: The Lung Association

Background/Purpose: Exercise is an effective treatment for individuals with chronic obstructive pulmonary disease (COPD) however; adherence to exercise programs is a common barrier. Innovative approaches to exercise are needed to increase patient engagement and adherence. Dance has been shown to benefit populations with neurological conditions. The aim of our study was to investigate the feasibility of a dance intervention in individuals with COPD.

Methods: Twenty individuals with COPD participated in a one-hour dance class delivered twice a week for 8 weeks. The primary outcome measure of the study was the feasibility determined by enrollment rate, attendance rate, adverse events and participant satisfaction. Secondary outcomes included functional capacity, balance, anxiety and depression, steps count and health related quality of life.

Results: Of the 47 individuals approached, 37 (79%) were interested in the program and 23 (49%) consented to participate and 20 completed the program with no adverse events and a mean attendance rate of 78%. The mean age (SD) of the participants was 73.4 (7.6) years and 70% were females. Participant satisfaction with the program was high and significant improvements were achieved in the 6-minute walk test ($p=0.03$), Balance Evaluation Systems Test (BESTest) ($p<0.01$), Chronic Respiratory Disease Questionnaire ($p=0.001$) and the Activities-specific Balance Confidence scale ($p=0.007$).

Summary/Implications: Dance is an enjoyable, safe and feasible way to exercise for those with COPD. This pilot study will inform the design of a larger randomized controlled trial to determine effectiveness of dance on exercise capacity, balance and quality of life for people with COPD.

Poster #7:

Critical analysis of the evidence underpinning Canadian traumatic brain injury guidelines for adults with comorbid depression

Adora Chui, Rehabilitation Sciences Institute; Deirdre Dawson, Rehabilitation Sciences Institute; Heather Colquhoun, Rehabilitation Sciences Institute.

Field of study: Practice Science, Rehabilitation Health Services Studies

Funding: Queen Elizabeth II /Medicine/Patty Rigby and John Wedge Graduate Scholarship in Science and Technology

Background: Clinical practice guidelines (CPGs) are evidence-based tools created for an index condition from primary sources whose narrowly defined samples typically lack external validity (i.e. limited generalizability to real-world populations); the applicability of CPGs for those with comorbidities is underwhelming. Traumatic brain injury (TBI) is the most prevalent neurological condition in Canada and 33.2% of Canadians with TBI also report being depressed. However, the degree to which TBI CPGs apply to adults with comorbid depression is unknown. The purpose of this critical analysis is to establish the degree to which the evidence underpinning Canadian TBI CPGs include adults with comorbid depression.

Methods: Two Canadian TBI CPGs will be examined: ONF-INESSS Clinical Practice Guideline for the Rehabilitation of Adults with Moderate to Severe TBI, and ONF Guideline for Concussion/Mild TBI & Persistent Symptoms. Specific objectives are to: 1) evaluate the basis of CPG recommendations by type of evidence source, number of evidence sources, and degree of derivation from original source; 2) determine how well included adults with depression are in the randomized control trials underpinning intervention recommendations (by examining reporting of TBI and depression variables); and 3) compare the degree of depression representation by recommendation type (i.e., depression vs. non-depression mental health vs. non-mental health recommendations).

Planned Analysis: Descriptive statistics will be presented in summary tables for quantitative data. Content analyses will be done for the textual data.

Expected Outcomes: This in-depth critique of two current Canadian TBI CPGs for adults with TBI will contribute to the redress of potential disparities in rehabilitation effectiveness for adults with TBI and comorbid depression. Implications for future research on improved development and applicability of CPGs for those with comorbidities will be discussed.

Poster #8:

Structuring a dance program for people with stroke

Sarah Gregor, Rehabilitation Sciences Institute, University of Toronto; Aaron Wallace, Department of Physical Therapy, University of Toronto; Hilary Walsh, Department of Occupational Sciences & Occupational Therapy, University of Toronto; Julie Vaughan-Graham, Department of Physical Therapy, University of Toronto; Kara K Patterson, Department of Physical Therapy, University of Toronto.

Field of Research: Movement Science, Rehabilitation Health Services Studies

Funding: Canadian Partnership for Stroke Recovery

Background/Purpose: Dance is an effective way to improve physical, psychosocial, and cognitive function, while increasing community participation among individuals with stroke living in the community. Yet little is known how to structure such classes to optimize benefits and participation. The purpose of this study is to gain stakeholders' perspectives on how to optimally structure dance classes for individuals with chronic stroke.

Methods: A qualitative descriptive approach utilizing focus group methods was implemented. Six focus groups with persons post-stroke, rehabilitation therapists, and dance instructors were conducted. Focus groups were homogenous by stakeholder group, audio-recorded, and transcribed verbatim. Analysis of focus groups were completed using the DEPICT model of collaborative qualitative analysis.

Results: This study identified three main themes, or topics, requiring consideration when structuring a dance program: The environment; the flow of the class; and the qualities of the dance instructor. The study findings highlight that the dance instructor is an integral feature for a successful dance program, as they directly mediate both the environment and flow of the dance class.

Summary/Implications: Recommendations generated from our qualitative study will inform the development of dance programs that are practical, optimize health benefits, and meet both the needs and interests of people post-stroke.

Poster #9:

Understanding cognitive-linguistic impairment in bulbar-ALS

Amanda Martino, University of Toronto; Yana Yunusova, University of Toronto; Sanjay Kalra, University of Alberta; Dennell Mah, University of Alberta; Madhura Kulkarni, Sunnybrook Research Institute; Lorne Zinman, University of Toronto.

Field of Research: Speech-Language Pathology, Rehabilitation Health Services Studies

Funding: ALS Society of Canada Arthur J Hudson Translational Team Grant

Background/Purpose: Amyotrophic lateral sclerosis (ALS) is a progressive neurological disease characterized by upper and lower motor neuron degeneration in the brain and spinal cord. In addition to motor impairment, up to 50% of patients exhibit deficits in executive function and language. Bulbar-ALS is often considered the most devastating form of this disease, due to its effects on speech communication, swallowing, and survival. The majority of patients develop bulbar symptoms as the disease progresses. A number of studies suggest that bulbar motor dysfunction is linked to cognitive-linguistic impairment; however, this association has been disputed. The goal of this study is to further explore the association between bulbar motor and cognitive-linguistic impairment in patients diagnosed with ALS. As compared to previous research, bulbar ALS will be quantified not only using standard clinical approaches, but also using instrumental speech measurements sensitive to the early stages of the disease and its progression.

Methods: A large dataset from the Canadian ALS Neuroimaging Consortium (CALSNIC) is being used to achieve this aim. 85 patients and 62 controls met inclusion criteria, and 37 patients and 25 controls completed follow-up visits. At each session, participants underwent a clinical evaluation, neurological examination, structural MRI, bulbar motor assessment, and neuropsychological test battery. To examine the association between bulbar motor impairment and cognitive-linguistic dysfunction, scores on the ALS functional rating scale (ALSFRS-R), speaking rate (in words per minute), and percent pause time during passage reading will be examined in relation to performance on the Edinburgh Cognitive and Behavioural ALS Screen (ECAS). Cross-sectional data will be analyzed using ANOVA and correlation/regression models. Longitudinal data will be analyzed using mixed linear models.

Results: Data analysis is on track to be completed by the end of March 2019.

Summary/Implications: Understanding bulbar ALS and its extramotor presentation is crucial in order to provide comprehensive patient care. Knowledge of the cognitive-linguistic profile of the disease contributes to disease subtyping, allowing for better targeted clinical trials. Expanding knowledge of the pathophysiology of bulbar-ALS will also direct assessment and treatment of patients. In speech-language pathology, this knowledge will result in more individualized management plans focused on early intervention and improved quality of life.

Poster #10:**The benefit of dysphagia screening in adult patients with stroke: A systematic review**

Victoria Sherman, University of Toronto; Elissa Greco, University of Toronto; Lily Nicholson, University of Toronto; Vicky Luo, University of Toronto; Rosemary Martino, University of Toronto.

Field of Study: Speech-Language Pathology

Funding: Sickkids Clinician Scientist Training Program

Background/Purpose: Dysphagia is a common consequence following stroke in adults and can lead to serious health complications. Dysphagia screening is one way to identify dysphagia early in hopes of improving health outcomes and facilitating better recovery. There remains limited high-level evidence exploring the benefit of screening on patient health across multiple study designs. This systematic review sought to assess whether dysphagia screening (I) in adult stroke patients (P) reduces the frequency of medical complications such as pneumonia, malnutrition, disability or mortality (O) compared to similar patients with no early detection (C).

Methods: Seven electronic databases were searched in 2013, and then re-run and updated in 2018, yielding 2296 and 2538 citations respectively. Following duplicate removal, two independent and blinded raters assessed abstracts and full articles for eligibility. Articles were removed if: no human subjects, narrative review, n<10, more than 10% of subjects <18 years or diagnosis other than stroke, no mention of screening, no mention of health outcome, or no comparison outcome data. Discrepancies were resolved by consensus. Final accepted studies were summarized, assessed for methodological quality and data extracted for descriptive analysis.

Results: There were 18 included studies that met all criteria, 16 observational studies and 2 randomized trials. Across studies, heterogeneity was identified regarding: type of dysphagia screening tool, protocol, timing of screen, and the comparison group(s). Significant benefit to health was reported for pneumonia in 7/14 studies, mortality in 6/13 studies, disability in 3/6 studies, and length of stay in 2/7 studies. One study reported hospital costs, another reported discharge to self-care, and yet another reported overall infection rates.

Summary/Implications: Deriving evidence from observational and experimental designs, there is evidence from multiple studies on the benefit of dysphagia screening on patient health. This evidence provides support for the implementation of validated tools for early detection of dysphagia in patients with stroke.

Poster #11:

Sex and gender differences in caregiving burden experienced by family caregivers of persons with dementia: a systematic review

Chen Xiong, Rehabilitation Sciences Institute, University of Toronto; Melissa Biscardi, Rehabilitation Sciences Institute, University of Toronto; Jill Cameron, Rehabilitation Sciences Institute, University of Toronto; Alex Mihailidis, Rehabilitation Sciences Institute, University of Toronto; Arlene Astell, Rehabilitation Sciences Institute, University of Toronto; Emily Nalder, Rehabilitation Sciences Institute, University of Toronto; Angela Colantonio, Rehabilitation Sciences Institute, University of Toronto.

Field of Research: Rehabilitation Technology Science, Rehabilitation Health Services Studies

Funding: Canadian Institutes of Health Research, Health Canada

Background/Purpose: Much is known about the demands of caregiving for a person with dementia (PWD) and its effects on family caregivers and their care recipients, however sex and gender aspects have received less attention. This systematic review aims to: (1) describe any sex and gender distinctions in caregiving burden experienced by family caregivers of persons with dementia, and (2) determine the impact of sex and gender differences on the physical and mental health of family caregivers of PWD.

Methods: Peer-reviewed English language studies of adult family caregivers of PWD, published between January 2007 to September 2017, found through Medline, Embase, PsycINFO and Cumulative Index to Nursing and Allied Health Literature. Eligible articles were identified by two independent researchers using pre-determined inclusion and exclusion criteria. Study quality was evaluated independently using the Critical Appraisal Skills Programme checklist and National Institutes of Health Quality Assessment Tool for Observational Cohort and Cross-sectional Studies.

Results: A total of 19 studies were included, of which 16 were quantitative and 3 were qualitative. Caregiving burden among family caregivers was measured using various methods with most studies reporting higher burden among females. With respect to mental and physical health, studies examined a wide range of conditions including depression, psychological stress, sense of coherence, ability to control disturbing thoughts, family conflicts, guilt, sleep, quality of life, intimacy experiences, inflammation and comorbidity. Findings on sex and gender differences on physical and mental health conditions were inconsistent with most studies failing to account for confounders in their analyses.

Summary/Implications: The current literature and evidence on sex and gender differences in caregiving burden, mental and physical health is limited. Nonetheless, findings from the included studies suggest the presence of sex and gender differences in caregiving burden, with female caregivers experiencing more burden compared to their male counterparts. Given the variety of mental and physical health constructs that were examined across individual studies, further research is required to substantiate the evidence. Additionally, an enhanced set of standardized scales that are suited for such a caregiving population will enable better comparisons across studies.

Poster #12:

Exploring the meaning of body language in children with Autism Spectrum Disorder during physical activity

Ilana Naiman, University of Toronto/Bloorview Research Institute; Kelly Arbour-Nicitopoulos, University of Toronto; Virginia Wright, Bloorview Research Institute.

Field of Study: Movement Science, Practice Science

Funding: Bloorview Childrens Hospital Foundation Chair in Pediatric Rehabilitation

Background/Purpose: Autism spectrum disorder (ASD) occurs in around 1 in 66 children in Canada, is characterized by deficits in social communication, and often accompanied by challenging behaviours. Roughly 70% of children with ASD have an IQ at or above average and can engage in inclusive activities. However, there are barriers to participation for children with ASD, specifically in physical activity (PA) programs, that can lead to bullying and isolation. Barriers include impaired social skills, delayed motor skills and a lack of understanding about ASD by recreation staff. PA has health benefits for all children and additional benefits for those with ASD (e.g., reduced anxiety and stereotypic behaviours). Due to the communication deficits associated with ASD, the purpose of the current study is to explore the potential disconnect between instructor's interpretation of body language cues used to communicate and the self-report of the child's actual enjoyment/dislike of PA experiences.

Methods: Thirty children with ASD (6-12 years) are being recruited at Bloorview Research Institute. Parents are asked to bring activities that the child (a) enjoys and (b) does not enjoy as a baseline indicator of their enjoyment/dislike cues, and to quickly familiarize the child with the assessor. After this introduction, the assessor conducts the Ignite Challenge, a 13-item advanced gross motor skills assessment, with the child to observe the child's body language during each task and their motor skill abilities. The child then rates their enjoyment of each task on a visual-analog scale (VAS). Both the initial activity and Ignite are filmed. The videos are coded for body language cues that the research team interprets as enjoyment/dislike and are cross referenced with the child's VAS scores.

Results: We hypothesize that a disconnect will be shown in our data between body language interpretation and the child's level of enjoyment rating.

Summary/Implications: This study is the first step in my three-phased dissertation to gain a better understanding of the meaning behind body language cues of children with ASD. The results will help in the creation of a body language coding measure (Phase 2) that will be iteratively built to identify body language cues with their commonly intended meaning. This coding measure will be taught to PA instructors (Phase 3) to enhance their communication with children with ASD and consequently better support children's needs during the PA.

Poster #13:**Exploring the perspectives of community-dwelling wheelchair users with spinal cord injury on the causes and psychosocial impact of falls**

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Field of Research: Movement Science, Rehabilitation Health Services Studies

Funding: Craig H Neilsen Foundation, Toronto Rehabilitation Institute Student Scholarship

Background/Purpose: Wheelchair users with spinal cord injury (SCI) are at a high risk of falls.¹ In addition to physical injuries, falls can impact the psychological health and wellbeing of a faller.¹ The perspectives of wheelchair users regarding the causes and psychosocial impact of falls remain understudied. Therefore, this qualitative study explored from the perspective of wheelchair users: 1) the causes of falls and 2) the psychosocial impact of falls on their lives.

Methods: Community-dwelling wheelchair users with a chronic (>1 year), traumatic SCI between C1-L1 and experienced a fall in the past six months were eligible to participate in this study. Over seven days, participants captured photographs of factors that influenced their risk of falling and how the risk of falling impacted their paid/volunteer work and recreation/leisure activities. After taking photographs, participants participated in an audio-recorded photo-elicitation interview to discuss the content depicted in their photographs. Interviews were transcribed verbatim and analyzed using a thematic analysis.² Multiple authors were involved in the interpretation of the themes to ensure rigor in our analysis.

Results: Twelve individuals (four males and eight females) aged 42±12 years and were 21±15 years post-injury participated. The individualized and dynamic nature of fall risks were overarching themes revealed from the interviews. Falls were caused by the following factors: 1) behavioural (e.g. being distracted); 2) biological (e.g. core/leg spasms); 3) environmental (e.g. debris or uneven ground); and 4) social and economic (e.g. quality of attendant care workers). The psychosocial impacts of falls related to: 1) engagement in activities of daily living; 2) parenting role; 3) paid/volunteer work; 4) recreation/leisure; and 5) caused negative emotions.

Summary/Implications: Multiple contributors to falls were identified in this study, many of which were modifiable. A persistent concern of falling and/or the outcome of an injurious fall may have a psychosocial impact on the life of a faller. Fall prevention initiatives should educate wheelchair users on identifying their fall risk factors and remove/reduce/advocate for fall risk factors reduction in the environment. Furthermore, clinicians are encouraged to look beyond the physical impacts of a fall and explore the psychosocial impacts of a fall on their clients' wellbeing.

1. doi:10.2340/16501977-2177
2. doi:10.1191/1478088706qp063oa

Poster #14:**Developing and validating a novel concussion survey for high school aged youth**

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Field of Research: Rehabilitation Health Services Studies

Funding: Canadian Institutes of Health Research, Ontario Graduate Scholarship

Background: High school aged youth can sustain a concussion in a variety of settings and can experience a range of symptoms. Existing concussion surveys investigating concussion reporting are primarily focused on athletes and sport-related concussions. The provision of social support from high school aged youth after a peer sustains a concussion has been identified as a key support to recovery. To date, there are no existing measures of high school aged youths' intent to report a concussion and provide social support to a peer relevant across a variety of settings.

Purpose: To develop and validate a novel concussion survey, informed by the Theory of Planned Behaviour, that captures high school aged youths' intent to 1. report concussion symptoms to an adult and 2. provide social support to a peer after a concussion.

Methods: The novel concussion survey was developed based on past concussion surveys and input from experts in the area of pediatric concussion. The survey was validated in two stages: cognitive interviewing and survey validation. Cognitive interviews were done with high school aged youth to inquire about the context, level of difficulty and relevance of questions. Survey validation was conducted by having high school aged youth complete the survey. This was done to understand whether questions are measuring the two desired constructs, intent to 1. report concussion symptoms to an adult and 2. provide social support to a peer after a concussion.

Anticipated Results: Through cognitive interviewing, five youth provided feedback on the wording and context of questions. The survey was updated using this feedback prior to survey validation. For survey validation, 243 participants completed the survey. Data analysis will include a confirmatory factor analysis to ensure that questions are measuring the desired constructs and analysis for question stability. The survey will be shortened and questions will be removed based on response variability.

Implications: This work provides a novel and validated survey of concussion reporting and the provision of social support for high school aged youth across a variety of settings. This survey has the potential to be used as a measure of concussion related behaviour change for high school aged youth.

Poster #15:

The effect of walkway incline angle on balance control in healthy older adults and ankle foot orthosis wearers with lower motor neuron pathologies

Jennifer Bautista, University of Toronto; Gordon Ruder, George Brown College; Stephen Perry, Wilfrid Laurier University; Rebecca Greene, University of Toronto; Vicki Komisar, Simon Fraser University; Alison C Novak, Toronto Rehabilitation Institute - University Health Network.

Field of Research: Movement Science

Background/Purpose: Walking on inclined surfaces carries unique challenges such as increased friction demands, the controlled raising and lowering of the body's center of mass (COM), and increased range of motion demands at the ankle. The demands of sloped walking may be increased further for older adults or when impairment is also present, although there is limited research describing sloped gait for these individuals. Considering persons with impairment specifically, many people with neurological pathologies wear ankle foot orthoses (AFOs) to improve function; however, it is currently unknown how sloped gait affects balance in people who wear AFOs. The purpose of this study is to determine how walkway incline angle affects dynamic balance in healthy older adults, and AFO wearers with lower motor neuron pathologies.

Methods: Four AFO wearers with lower motor neuron pathologies and fourteen healthy older adults participated. Following instrumentation, participants walked up and down slopes ranging from 0-8 degrees. Ramp angle was block randomized, grouped by sloped degree to minimize effects of learning and fatigue. AFO wearers completed the protocol with and without their AFOs. Following data collection all AFOs were measured, photographed, and characterized by materials used in fabrication.

Measures of interest included minimum margin of stability during weight acceptance and single leg support and spatiotemporal features of gait.

Results: Findings during weight acceptance indicate that in the frontal plane, AFO use did not affect lateral stability across any of the angles tested. In the sagittal plane, minimum anterior margin of stability decreased with decreasing angle during descent and increased with increasing angle during ascent for all groups. The AFO group adjusted their gait to accommodate to the challenge of the task, as seen with slower COM velocity, resulting in greater margins of stability for all angles for the AFO group without their AFOs, and for descent and level ground while walking with their AFOs.

Summary/Implications: Initial findings suggest that orthotic intervention and walkway incline angle affect stability in the sagittal plane. Understanding how walkway angle affects stability is vital for guiding safe ramp design as well as providing clinicians with the knowledge of how orthotic intervention affects their patients.

Poster #16:

Scoping review on visual analytics in population health and health services research: Methodology, challenges and preliminary findings

Jawad Chishtie, Rehabilitation Sciences Institute, University of Toronto; Monica Cepoiu-Martin, University of Calgary; Iwona Bielska, McMaster University; Jean-Sébastien Marchand, Université de Sherbrooke; Jessica Babineau, University Health Network; Luke Turcott, University of Waterloo; Michael Irvine, University of British Columbia; Tara Jeji, Ontario Neurotrauma Foundation; Susan Jaglal, Department of Physical Therapy, University of Toronto.

Field of Research: Rehabilitation Health Services Studies

Background and Objectives: Visual analytics (VA) promotes the understanding of data using visual and interactive techniques. VA outputs include flow maps and spatiotemporal hotspots for studying service gaps, disease distribution and equity concerns. However, VA refers to diverse ideas and the term is used inconsistently. The objective of this scoping review is to examine the state of science on VA, and the various tools, strategies and frameworks used in population health and health services research. The proposed research question is: what is known from the existing literature about the use of visual analytics in health services research and population health, in terms of tools, strategies and frameworks?

Methods: We will primarily use Arksey and O'Malley's approach, with improvements suggested by Levac et al and Peters et al to guide the scoping review methodology. One of the major challenges for this review was operationalizing the concepts for developing the search strategy, which is based on three main concepts: population health, health services research and visual analytics. We will include peer reviewed and grey literature sources from 2005 till March 2019. Independent teams of researchers will screen the titles and abstracts, while an expert third party will decide on the conflicts. Full text screening will follow in the same manner. Data will be abstracted and presented using the PRISM-ScR statement.

Following an adjusted scoping review protocol, our main challenge was to build an effective search strategy. Towards this, we operationalized the concepts of VA, health services research and population health using recent literature and guidance from multiple sources. Population health, health services research and visual analytics proved to be vague terms. Population health has only been recently indexed as a MeSH term, while there are overlaps between this and health services research. The "population health approach" brings both together in its application towards health sector reform. Similarly, the term visual analytics is vague, and alternate terms such as data and information visualization are used in the literature.

Results: We will present the processes and methodological challenges for the scoping review, especially in developing a search strategy for the three main concepts.

We will present the preliminary results from the literature from databases (Medline, Embase, Compendex, Inpec, IEEE Xplor) and grey literature sources, based on key words search strategy from the operationalization.

Poster #17:

Bootle Blast: A novel video game for home-based rehabilitation for children with hemiplegic Cerebral Palsy

Daniela Chan-Viquez, Bloorview Research Institute; Ajmal Khan, Bloorview Research Institute; Darcy Fehlings, Bloorview Research Institute; Virginia Wright, Bloorview Research Institute; Elaine Biddiss, Bloorview Research Institute.

Field of Research: Rehabilitation Technology Science, Movement Science

Funding: Hilda and William Courtney CLAYTON Paediatric Research Fund, CIHR, NSERC

Background: Transport, time and geographic constraints can limit access to rehabilitation services for children with Cerebral Palsy (CP). This motivates interest in home-based therapy programs. Bootle Blast (BB) is a low-cost, movement-tracking video game that encourages practice of upper limb (UL) exercises at home. BB integrates best practices in motor learning and video game design and can be tailored to each child's therapy goals. This pilot study trial will 1) determine feasibility of BB for sustaining play adherence in line with a family-centered play time goal, 2) identify improvements in UL motor function, and 3) explore the participants' experiences of using BB for home rehabilitation. Feasibility criteria are: at least 80% of children will achieve their target play time goal, measured via computer game-logs.

Methods: A convenience sample of 10 children with hemiplegic CP (8-17 yrs), Gross Motor Function (GMFCS) & Manual Activity Classification System (MACS) I-III, not receiving treatments directed towards UL function, able to follow instructions, and having a caregiver who will participate will be included in the study. Clinical assessments will be conducted at our children's rehabilitation centre. The intervention will take place at the participant's home for 12 weeks. An occupational therapist will perform study assessments at baseline, post intervention and 4 weeks follow up. Measures will target UL motor function (Melbourne Assessment of Unilateral Upper Limb Function, range of motion, Box&Blocks, Assisting Hand Assessment, [AHA]) and occupational performance on self-identified UL challenge areas (Canadian Occupational Performance Measure [COPM]). Post intervention semi-structured interviews will explore participants' experiences using BB. Home visits at weeks 1, 6 and 12 will be conducted to collect computer game-logs, which provide data about active play time and progress.

Results: Pilot data from one child (male, 13yrs, GMFCS I, MACS I) indicated that target play time was achieved in 11/12 weeks. Improvements were observed on the COPM (performance = +3 pts, satisfaction = +4 pts), AHA (+5 logit pts), active wrist extension (+13.8°), and Box&Blocks (+3 pts). Post interview suggested that BB was "fun" and useful for UL rehabilitation.

Implications: BB was able to sustain play adherence leading to clinical improvements in UL motor outcomes. Findings from this study will enhance our understanding on how low-cost technology video games can be best deployed for home-based rehabilitation.

Poster #18:

Four shades of gray: Understanding the effect of visual contrast on stair edges to improve safety

Marko Bjelica, Rehabilitation Sciences Institute, University of Toronto; Iris C. Levine, Toronto Rehabilitation Institute, University Health Network; Alison C. Novak, Toronto Rehabilitation Institute, University Health Network.

Field of Research: Movement Science

Funding: RERC

Background/Purpose: Stairways are the second most common location of falls, resulting in serious skeletal damage, traumatic brain injuries, and fatalities. Visual impairment, which affects approximately one third of people over the age of 65, is a key concern for safe stair navigation. Vision impairment can lead to poor discernment of step edges and obstacles, leading to missteps. To improve visual contrast, many public stairs include a “tread edge highlighter”, although these are not regulated in Canadian building codes; internationally, there is no consensus on contrast intensity. Evaluation of the link between visual contrast and biomechanical fall risk factors will provide evidence to inform stair design standards.

Aim: Assess the effect of step edge visual contrast levels on biomechanical measures of fall risk for older adults, with and without simulated vision impairment, and under low and normal lighting conditions.

Methods: Healthy older adults (N=22, age >65) with normal vision completed 51 stair descent trials in StairLab within the Challenging Environment Assessment Laboratory. Visual contrast levels (0%, 30%, 50%, 70%) coinciding with common international recommendations were tested alongside illumination conditions (30 lux, 300 lux) corresponding to minimal building stairwell lighting and the upper limit of civil twilight, respectively. Vision loss due to cataracts was simulated via sand-treated goggles. Kinematic data was analyzed to determine biomechanical measures of fall risk, such as foot-to-step clearance and foot overhang percentage.

Results: It is expected that simulated visual loss and low-lighting level will interact with visual contrast level. During normal vision illuminated at 300 lux, no significant difference between contrast levels is expected for biomechanical fall risk factors. However, during low lighting and simulated cataract conditions, the higher contrast tread edge highlighters are expected to result in less variability in foot trajectory and safer clearance distances. Frequency of heel scuffs was observed to decrease as contrast levels increased. Simulated vision impairment had a greater debilitating effect than low illumination when examining heel scuffs.

Summary/Implications: Results from this study will support guidelines for the Canadian Codes and Standards Committees to build a safer environment and reduce fall risk among older adults.

Poster #19:**Influence of grab bar orientation on balance recovery during bathtub exits**

Konika Nirmalanathan, Rehabilitation Science Institute, University of Toronto; Philippa Gosine, Institute of Biomaterials and Biomedical Engineering, University of Toronto; Iris Levine, Rehabilitation Institute, University Health Network; Alison C. Novak, Department of Occupational Science & Occupational Therapy; Faculty of Kinesiology and Physical Education, University of Toronto; Rehabilitation Institute, University Health Network.

Field of Research: Movement Science, Rehabilitation Technology Science

Funding: GLSE OSOFT, CIHR

Introduction: Bathtub transfer is a challenging task as it requires people to appropriately cross the bathtub rim and step in and out of a potentially wet surface. To combat this challenge, clinicians recommend installing grab bars, although recommendations are generally guided by experience rather than evidence supporting effective balance during transfer. The purpose of this study is to examine how grab bar orientation impacts balance control and lower limb effort during bathtub exit. By evaluating the influence of grab bar conditions under realistic bathing settings, evidence can be generated to inform standards and clinical recommendations.

Methods: 20 healthy younger adults and 10 healthy older adults were invited to the Challenging Environment Assessment Laboratory at Toronto Rehabilitation Institute-UHN, where they completed several bathtub transfers. The bathtub was wetted with a slippery solution and perturbations were delivered to evoke a balance loss when the participants exited the tub, requiring participants to use the grab bar. Three grab bar conditions were tested: low horizontal grab bar (34" above the ground), high horizontal grab bar (40" above the ground), and vertical grab bar [C.S. Association, 2015; Batista et al., 2016]. These conditions were determined based on previous research and recommendations for grab bar standards. Grab bar loading, centre of mass (COM) variables and joint moments will be analyzed to evaluate how these orientations impact balance control and lower limb effort during bathtub exit.

Results: Data analysis is ongoing. It's expected that the height of the grab bar will impact balance control. The ability to grasp higher on the vertical grab bar may offer greater balance control, whereas the low horizontal grab bar may require greater efforts to recover from the balance loss, as shown in previous studies on horizontal handrails [Komisar et al., 2018]. It's expected that older adults will have poorer balance control and higher reliance on the grab bar, demonstrated by high forces applied on the grab bar and greater variability in COM control.

Implications: Findings from this study will provide evidence to guide clinical recommendations and installation standards, particularly on which grab bar orientation is effective for balance control. By providing appropriate evidence to improve current guidelines and recommendations, the risk of falls and fall-related injuries can be reduced during bathtub activities.

Poster #20:

Effect of a single session of exercise on motor learning: Does aerobic fitness level matter?

Andrea Hung, Rehabilitation Sciences Institute, University of Toronto; Marc Roig, School of Physical & Occupational Therapy, McGill University; Catherine Sabiston, Faculty of Kinesiology and Physical Education, University of Toronto; Joyce L Chen, Faculty of Kinesiology and Physical Education, University of Toronto.

Field of Research: Movement Science

Funding: NSERC

Background/Purpose: Whether we are learning to hit a baseball or play the piano, the execution of movement-based skills (i.e. motor skills) allows us to gain new experiences and develop new passions. Motor learning is defined as practicing a set of movements to develop lasting improvements in skill performance. To evaluate if performance improvements are lasting (i.e. retained), retention tests can be conducted after periods of no practice.

Motor learning is enhanced when motor skill practice is immediately followed by aerobic exercise. However, studies have mainly investigated these effects in aerobically trained individuals. It is unknown whether aerobically untrained individuals would also benefit from exercise effects on motor learning. This study investigates how aerobic fitness level (Aerobically Trained (AT) vs. Aerobically Untrained (AU)), as determined by peak oxygen uptake (VO_{2peak}), affects an individual's ability to learn a motor skill after aerobic exercise. We hypothesize that after exercise, AU will have worse motor skill retention than AT.

Methods: Individuals in the top 25% (AT) or bottom 25% (AU) of age and sex specific normative VO_{2peak} values will be invited to participate in the study. Participants will be randomized to the Exercise (4 AT, 9 AU) or Rest (4 AT, 8 AU) group. Participants will practice a visuomotor tracking task (six blocks of 20 trials), cycle (Exercise) or sit (Rest) for 25 minutes, and complete a 24-hour retention test (one block of 20 trials). Motor skill retention (Ret) will be assessed as the score difference between the retention test and last block of practice.

Results: Data collection is ongoing. Average VO_{2peak} (ml/kg/min) for AT-Exercise = 51.52, AT-Rest = 51.09, AU-Exercise = 30.1, and AU-Rest = 30.47. During Exercise, AT-Exercise cycled at an intensity equivalent to 86.0% HRmax and AU-Exercise at 85.7% HRmax. Preliminary results suggest that AT-Exercise may have worse Ret compared to AU-Exercise (Ret-AT-Exercise = -2.07, Ret-AU-Exercise = -1.04).

Implications: The benefits of exercise on motor learning may provide individuals with a novel way to enhance learning new instruments or sports. There is also interest in exercise as a motor rehabilitation strategy post stroke. However, stroke survivors often have low aerobic fitness and it is unknown whether those with low aerobic fitness can benefit from exercise effects on motor learning. This research will progress understanding of populations that could benefit from aerobic exercise for motor learning.

Poster #21:

Participatory action research with individuals who have a moderate to severe traumatic brain injury: the process of co-creating a peer-run physical activity program in the community

Enrico Quilico, University of Toronto; Bonnie Swaine, University of Montreal; Shane Sweet, McGill University; Lindsay Duncan, McGill University; Shawn Wilkinson, Concordia University; Angela Colantonio, University of Toronto.

Field of Research: Occupational Science, Rehabilitation Health Services Studies

Funding: SSHRC, Sport Canada

Background: Physical activity (PA) and sport are suggested as a non-stigmatizing approaches to address long-term problems following moderate and severe traumatic brain injury (TBI) and can positively influence community integration, mood, and quality of life. However, promoting PA and sport participation after TBI is challenging due to long-term sequelae associated with the injury. Consequently, PA and sport programs must be appropriately designed. This project aims to pursue the co-creation of a community-based PA and sport program for persons with TBI and stems from a pilot program that began in 2017. To facilitate the implementation, evaluation and sustainability of the program, formal procedures and toolkits must be co-created with researchers and stakeholders to ensure the content is tailored to the program users' needs. The purpose of this cross-provincial study is to 1) explore the impact of the current program on mentors, participants, and administration to inform the creation process and account for sex and gender; 2) co-construct the program's logic model while identifying strategies to ensure program sustainability; 3) co-create a set of clearly-defined protocols for the new program with sex and gender considerations; 4) evaluate the program in a feasibility study in 2020.

Methods: An embedded mixed-method design will be used in which supplemental qualitative data will be collected to enhance the development of the program protocol. This design incorporates participant perceptions and experiences of the program to support aspects of the overall application and evaluation of the program. A heterogeneous convenience sample of 20 community-dwelling, adult participants (4 peer mentors, 16 active participants) with severe TBI has been purposely recruited for the program. In line with the participatory action research approach, there will be equitable collaboration among organizational representatives (n=3), a team of multidisciplinary researchers (n=5) and community members (mentors, n=4) in the research process. Regular scheduled sessions will take place with working groups to achieve the proposed objectives.

Anticipated Results: This poster will outline the process of co-creating a study protocol for this innovative community based research program with multiple stakeholders.

Implications: The results will further our understanding about the factors that promote PA and sport participation for adults with moderate to severe TBI and make recommendations about working in partnership with this community.

Poster #22:

Screening for depression in people with cognitive impairment receiving home care: A systematic review

Niculescu Iulia, University of Toronto; Iaboni Andrea, Toronto Rehabilitation Institute; Arora Twinkle, Toronto Rehabilitation Institute.

Field of Research: Social and Cognitive Rehabilitation

Introduction: Previous systematic reviews have investigated the performance of depression screening tools in older adults with cognitive impairment (CI) in clinics, nursing homes and residential care. Less is known about depression screening in home care, which is important to consider because the prevalence of CI and depression is high in home care.

Objectives: The objective of this study is to identify the best performing, evidence-based depression screening tool for individuals with CI receiving home care by first assessing the performance of depression screening tools and second, establishing the current evidence for depression screening practices.

Methods: A systematic search was conducted using MEDLINE, EMBASE, Health and Psychosocial Abstracts, PsycINFO and CINAHL with the following criteria: a sample of older adults (>55 years) with CI receiving home care, where performance outcomes of the assessed depression screening tool are reported. Data extraction and risk of bias assessments were completed.

Results: Of 5736 studies, three passed eligibility criteria: The Patient Health Questionnaire (n=236), the Geriatric Depression Scale (n=49) and the Mental Health Index (n=1,444) were assessed in samples of individuals with and without CI. Performance outcomes demonstrated low success in subsamples of CI. Furthermore, all studies showed varying degrees of risk of bias across categories of patient selection, study flow and timing, and use of reference standard and screening tools.

Conclusion: Little evidence can be concluded concerning the best screening practices among recipients of home care with CI from current studies. Limitations include biases in study methods and a general lack of existing studies.

Poster #23:

Interlocutor accommodation of gradually altered nasal signal levels in a model speaker

Telma Dias dos Santos, University of Toronto; Tim Bressmann, University of Toronto,

Field of Research: Speech-Language Pathology, Practice Science

Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES

Background: Phonetic accommodation is observed when interacting speakers gradually converge (or diverge) on features such as intonation over the course of a conversation. The present experiment investigated whether gradual changes in the nasal signal levels of a pre-recorded model speaker would lead to accommodation in the nasalance scores of the interlocutor in a speech-shadowing experiment.

Methods: Twenty female speakers in two groups repeated sentences after a pre-recorded model speaker whose nasal signal level was gradually increased or decreased over the course of the experiment. Outcome measures were the mean nasalance scores at baseline 1, maximum nasal signal level, baselines 2 and 3, minimum nasal signal level and baseline 4 conditions. The order of presentation of the maximum and minimum nasal signal levels was varied between the two groups.

Results: The results showed a significant effect of condition in $F(3) = 2.86$, $p = .045$. Both groups of participants demonstrated lower nasalance scores in response to increased nasal signal levels in the model (phonetic divergence). The group that was first presented with the maximum nasal signal levels demonstrated lower nasalance scores for the minimum nasal signal level condition (phonetic convergence).

Conclusion: Speakers showed a consistent divergent reaction to a more nasal-sounding model speaker but their response to a less nasal-sounding model depended on the order of presentation of the manipulations. More research is needed to investigate possible differences in the perception of increased versus decreased nasality in speech.

Poster #24:

A scoping review of literature on sex and gender differences among dementia spousal caregivers

Ifah Arbel, Rehabilitation Sciences Institute; Deirdre Dawson, Department of Occupational Science and Occupational Therapy; Kathleen Bingham, University Health Network.

Field of study: Occupational Science, Social and Cognitive Rehabilitation

Funding: Peterborough K.M. Hunter Charitable Foundation Graduate Award, Ydessa Hendeles Graduate Scholarship

Background/Purpose: Sex and gender differences among dementia spousal caregivers have been investigated, but never systematically reviewed or synthesized. A synthesis of findings can help facilitate specificity in practice and in health policy development. As a first step towards such a synthesis, this scoping review reports the available evidence, identifies research gaps, and suggests possible directions for future research.

Methods: A scoping review methodology was used to identify articles, and to chart and analyze data. Systematic searches for published, empirical studies, with an explicit goal or hypothesis related to sex or gender differences were conducted in seven databases.

Results: Sixty-one studies met inclusion criteria. Most (n = 45) were quantitative, cross-sectional studies. Caregivers included in the studies were generally 61-70 years old, Caucasian, middle-class, and highly educated. The most extensively investigated differences are: depression, burden, objective physical health, and informal supports.

Summary/Implications: This scoping review is the first to summarize and critique the research on sex and gender differences that are specific to dementia spousal caregivers. The review can be used by researchers to make decisions regarding future systematic reviews and primary studies. To further strengthen the evidence base, future studies may benefit from including more caregivers of ethnic minorities, using more qualitative, longitudinal, or experimental designs, and focusing on variables needed to inform caregiving models and theories. Overall, this scoping review contributes to furthering gender sensitive practices and policies that are better tailored to the specific needs of this population.

Poster #25:

Bone and muscle quality in postmenopausal women with osteoarthritis and osteoporosis - the Appendicular Muscle and Bone Extension Research Study (AMBERS)

Rachel Whyte, Rehabilitation Sciences Institute; Joint Department of Medical Imaging; Centre of Excellence in Skeletal Health Assessment; Abinaa Chandrakumar, Joint Department of Medical Imaging; Centre of Excellence in Skeletal Health Assessment; Shannon Reitsma, McMaster University; Eva Szabo, Centre of Excellence in Skeletal Health Assessment; Justin Chee, Centre of Excellence in Skeletal Health Assessment; Angela M Cheung, Centre of Excellence in Skeletal Health Assessment; Jonathan D Adachi, McMaster University; Andy Kin On Wong, Joint Department of Medical Imaging; Centre of Excellence in Skeletal Health Assessment.

Field of Research: Movement Science

Funding: CIHR

Background/Purpose: Our previous study showed that knee pain in women with both osteoarthritis (OA) and osteoporosis (OP) was associated with differences in bone but not cartilage properties. However, little is known about bone and muscle properties in this overlapping subgroup versus those with only OA.

Objectives: 1) To determine differences in muscle and bone quality among postmenopausal women with OP, OA, and those with both; 2) To evaluate the impact of muscle properties in knee OA and falls.

Methods: 312 women 60-85 yrs old from the Appendicular Muscle and Bone Extension Research Study (AMBERS) completed baseline imaging and annual follow-up on fractures, falls, and frailty for 3 years. This study is a cross-sectional analysis of the baseline data for women 76-85 yrs old (N=170). Peripheral QCT (pQCT) and MRI (pMRI) scans of the mid-leg (66% site) measured muscle density and % inter- and intra-muscular fat (%IMF). 4% distal tibia pQCT scans quantified bone density and micro-architecture. Total hip and lumbar DXA-derived BMDs were converted to T-scores for diagnosing osteoporosis. OA and knee OA were self-reported. Falls over the last 2 years were captured. General linear models compared muscle and bone properties among groups, exploring interactions between disease groups. Binary logistic regression examined the effect of muscle properties on OA and falls.

Results: Among 170 women (age:80±3yrs, BMI:29.1±5.5kg/m²), 37.1% had OA (58.7% knee), 18.8% OP, and 61.8% osteopenia. Among those with OA, 19.0% also had OP and 63.5% also had osteopenia. Muscle density was 2.44 mg/cm³ lower in those with knee OA versus without (p=0.011) but not all OA (p=0.130). In those with OA, concurrently having OP was associated with 48.51 mg/cm³ lower distal tibia volumetric BMD (p<0.001, interaction p<0.001), and 4.19% higher %IMF (p=0.023, interaction p=0.025). In those with OP, each standard deviation (SD) larger %IMF was associated with 4.85(1.18,19.91)-fold odds for knee OA (interaction p=0.028). This effect was not significant in those without OP. Having knee OA (OR: 2.94(1.03,8.40) or any OA (OR: 2.30(1.06,5.00) but not OP alone was significantly associated with falls.

Summary: The effect on bone and muscle properties for those with both OA and OP is significantly greater than for those with either disease alone. Having higher muscle adiposity is a risk factor for knee OA among those who already have OP. While this measure is not directly a risk factor for falls, knee OA itself was a prominent correlate of falls.

Poster #26:

Addressing intimate partner violence and traumatic brain injury in African immigrant communities: A protocol for a mixed methods critical community-based participatory action project

Samira Omar, Rehabilitation Sciences Institute, University of Toronto; Flora I. Matheson, St. Michael's Hospital, University of Toronto; Halina (Lin) Haag, Wilfrid Laurier University; Vincy Chan, Toronto Rehabilitation Institute - UHN, University of Toronto; Angela Colantonio, Toronto Rehabilitation Institute - UHN, University of Toronto.

Field of Research: Occupational Science, Rehabilitation Health Services Studies

Funding: Ontario Ministry of Health and Long-Term Care Health System Research Fund Grant

Background/Purpose: Intimate partner violence (IPV) is a significant problem in Canadian society with 1 in 4 women exposed during their lifetime. While the majority of the hits are to the head, face and neck in this context, there is currently a knowledge gap about traumatic brain injury (TBI) that can have significant health and disability implications. Among women of African descent, there is virtually no knowledge transfer (KT) mechanism to address this issue among this high risk group. This study aims to address this care gap by developing a research informed KT tool within the context of a larger study funded by the Ontario Ministry of Health and Long-Term Care entitled Integrating Brain Injury Mental Health and Addictions (grant #267).

Methods: Through building egalitarian partnerships with the community, this study will draw on the principles of a critical community based participatory action (C-CBPAR) approach within a mixed methodology to co-create and evaluate an educational toolkit to raise awareness of the intersection of IPV and TBI (IPV/TBI) in African communities and front-line service providers. Some anticipated challenges include differing onto-epistemological beliefs, issues of power within the research process, and diverging perspectives on the public health issue. Critical race theory and intersectionality will guide qualitative data analysis and the co-development of the educational toolkit. These theoretical lenses are particularly important in understanding the multitude of ways in which people of colour experience subordination as defined by race, class, gender, and other forms of oppression.

Results: C-CBPAR is driven by a desire for social justice and social change, shedding light onto the barriers and facilitators to healthcare access in this population. The principles of knowledge co-creation is a significant strength in this work as it maximizes impact and helps to bridge the knowledge gap between end users. This presentation will describe the protocol for this proposed study, which will include community consultation and co-creation and evaluation of a KT tool.

Summary/Implications: This work will raise awareness on IPV/TBI in African communities across Canada during this International Decade for People of African descent through the co-creation and evaluation of a culturally relevant educational toolkit that can aid and support both women survivors of IPV/TBI and front-line service providers working in the community and in healthcare.

Poster #27:

Spatial navigation intervention for individuals with multiple sclerosis

Julia Rybkina, Rehabilitation Sciences Institute.

Field of Research: Social and Cognitive Rehabilitation

Funding: University of Toronto Fellowship

Background: Canada has one of the highest rates of multiple sclerosis (MS) in the world. As many as 75% of all patients experience memory problems, making participation in work, school and social life even more difficult. The hippocampus, a key brain area for memory, navigating and decision-making, is often compromised in patients with MS. Neuroimaging studies have shown its progressive and continuous degeneration and associated cognitive decline in the domains of attention, information processing efficiency and episodic memory, which can even precede diagnosis. Encouragingly, accessible and self-administered cognitive treatment to benefit the hippocampi is possible. Allocentric “bird’s eye view” spatial learning and navigation has been found to protect the hippocampi. In a seminal study, Lovden and colleagues showed that healthy younger and older adults who underwent an intensive allocentric spatial navigation intervention exhibited reduced aging-related hippocampal atrophy and improved memory function after 16 weeks of treatment compared to controls. Modeled after the aforementioned study, our lab developed an allocentric spatial navigation intervention designed to improve memory and prevent hippocampal atrophy. It is remotely deliverable and available online, requires minimal therapist involvement and can be carried out at home. While originally designed for individuals with moderate-severe traumatic brain injury (m-sTBI), who notably also suffer from memory deficits associated with progressive hippocampal atrophy, this intervention may be extended to those with MS. Thus, the purpose of this study is to investigate the feasibility and preliminary efficacy of this intervention in MS patient population.

Methods: 50 patients with progressive MS will be recruited from TRI Rumsey Centre and randomly assigned to the spatial navigation intervention group or a no treatment/waitlisted control group. For 16 weeks, patients will allocentrically navigate through unfamiliar cities via a Google StreetView interface for 1 hour/day, 5 days a week, from a home computer. The control group will not complete intervention for 16 weeks. All participants will complete pre- and post-therapy assessments and MRI neuroimaging.

Results: In progress.

Impact: If successful, our study would improve the brain, memory and everyday functioning of people with MS. The intervention will reach patients regardless of where they live and of any physical or financial barriers that might preclude travel to a treatment facility.

Poster #28:

Extramotor involvement differs with severity of bulbar ALS: post-mortem neuropathological findings

Sanjana Shellikeri, University of Toronto; Julia Keith, Sunnybrook Research Institute; Sandra E. Black, Sunnybrook Research Institute; Lorne Zinman, Sunnybrook Research Institute; Yana Yunusova, University of Toronto.

Field of Research: Speech-Language Pathology, Movement Science

Funding: NIH, ALS Canada

Background/Purpose: Bulbar ALS, affecting speech and swallowing functions, may be associated with increased extramotor cognitive-linguistic deficits. The link between bulbar motor and extramotor involvement can be explained by a network breakdown of interconnected regions in neurodegenerative diseases. As such, regions of the speech-language network (SLN) that include the oral motor center in the primary motor cortex (PMC), as well as extramotor speech and language processing regions in the temporal and frontal lobes, may degenerate together and in relation to bulbar motor disease. The purpose of this study was to conduct post-mortem neuropathological analysis of motor and extramotor SLN regions in cases with and without bulbar ALS. We hypothesized that the severity and anatomic spread of degeneration in SLN regions would be related to bulbar motor dysfunction.

Methods: Neuropathological examination of post-mortem brain tissue was conducted on 3 bulbar-onset cases (bALS), 4 spinal-onset cases with antemortem bulbar symptoms (sALS_{WB}), and 3 spinal-onset cases without antemortem bulbar symptoms (sALS_{noB}). Regions-of-interest included bulbar and limb PMC, inferior frontal (IFG), posterior superior temporal (pSTG), superior frontal (sf), middle frontal (mf), and transverse temporal gyri (TT), as well as brainstem CNV, CNVII, and CNXII motor nuclei. Tissue were stained for neuronal loss, gliosis, and proteinopathy (i.e., TDP-43 and tau), and semi-quantitatively rated for severity of pathology.

Results: Extramotor pathology in IFG, pSTG, sf, mf, and TT were found only in cases with bulbar disease (i.e., bALS and sALS_{WB}). Severity and anatomic distribution of pathology was related to the degree of antemortem bulbar dysfunction with bALS presenting with the most severe and widespread pathology, followed by sALS_{WB} and then by sALS_{noB}. Bulbar cases also presented with tauopathy (i.e., tau+ tangles across cortical regions), not seen in any of the sALS_{noB} cases.

Summary/Implications: Bulbar ALS may have a unique neuropathological signature characterized by a distinct spatial distribution of pathology, and atypical proteinopathy. Specifically, regions of the SLN may be uniquely implicated in bulbar ALS, and show degenerative changes in relation to degree of bulbar motor disease. Findings support notion of neural network vulnerability in ALS. Bulbar ALS may also present with atypical tauopathy.

Poster #29:

Utilizing a dual task paradigm to better understand brain activation patterns in youth following concussion

Karolina Urban, Bloorview Research Institute; Larissa Schudlo, Bloorview Research Institute; Nick Reed, Bloorview Research Institute; Tom Chau, Bloorview Research Institute.

Field of Research: Occupational Science

Introduction: Recovery from a concussion can vary in time lengths, the array of symptoms present and can be difficult to monitor. Current return to play guidelines encourages focus on defining objective measures in order to better manage recovery and prevent subsequent risk of more catastrophic injury. Concussions are characterized as a functional injury where communication pathways between neural circuits are disrupted. Specifically, the dorsal lateral prefrontal cortices (DLPFC) and parietal lobes are critical in coordination of information and are particularly vulnerable to injury. In addition, it is critical to examine brain function while completing ecologically valid tasks.

Method: Control youth (n=14; age 15.8±1.7; Female n=10) and those who sustained a concussion (n=5; age 15.8±1.3; Female n=4) completed a dual task paradigm consisting of: single stroop, postural sway and single tasks concurrently. A functional near infrared spectroscopy head-cap (Hitachi ETG-4000) was placed via 10-20 EEG coordinates on frontal and parietal lobes to measure activation. Hemoglobin concentrations were fitted to a general linear model and solved for with an auto-regressive whitening and iteratively weighted robust regression algorithm. A mixed-effect model was applied to the mean regression coefficients and then averaged for each region of interest. Group comparison between each condition and ROI were completed using a non-parametric T-test and controlled for by the Benjamini-Hochberg correction.

Results: During single task, the concussion group had significantly greater activation in bilateral superior frontal gyrus (left, $q < .01$; right, $q < .001$), left inferior parietal ($q < .02$), left superior parietal cortex ($q < .001$), and right supramarginal ($q < .001$). During dual task on firm surface, there was greater activation in the right superior frontal gyrus ($q = .01$), right inferior frontal cortex ($q < .001$), and right superior supramarginal ($q < .001$) in the concussion group. Finally, dual Stroop task on foam surface elicited greater activation in the control group in the left DLPFC ($q < .01$) and bilateral superior parietal cortices (l, $q < .00$; r, $q = .01$), while the concussion group had higher activation in the left inferior parietal cortices ($q = .02$).

Conclusion: There was similar performance between groups during single and dual tasks, however the concussion group elicited hyperactivation in several brain regions. These brain regions are critical in coordination of information and thereby may need to be additionally activated.

Poster #30:

A narrative inquiry into the meaning-related processes of resilience in primary caregivers of children with TBI

Zara Szigeti, Rehabilitation Sciences Institute, University of Toronto; Gillian King, Bloorview Research Institute; Emily Nadler, Department of Occupational Science and Occupational Therapy, University of Toronto

Field of Research: Social and Cognitive Rehabilitation, Occupational Science

Funding: Canadian Institutes for Health Research - Canada Research Chair in Optimal Care for Children with Disabilities

Background/Purpose: Why is it that, when faced with severe adversity, some people bounce back while others crumble under the stress? Simply put, the answer is resiliency; the ability to overcome adversity and achieve positive adaptation. One adverse experience, for both the individual and those caring for them, is that of pediatric traumatic brain injury (TBI). Our study will investigate a particular resiliency-related process, which has been frequently cited as playing a fundamental role in adapting to negative life events; the way by which we derive meaning from adversity. Thus, the purpose of our study is to elucidate, through the use of narrative methods, how primary caregivers of children with TBI engage in meaning-related processes of building resiliency. The specific objectives are to explore: (1) how one's engagement with intrapersonal, interpersonal, and contextual resources and conditions influences meaning making in caregivers of children with TBI, if it is engaged in at all; and (2) how worldviews and subjective meanings of the TBI experience may influence one another in a bidirectional manner to promote resiliency.

Methods: Upwards of 15 primary caregivers will be recruited through a combination of Holland Bloorview Kids Rehabilitation Hospital, March of Dimes, Ontario Brain Injury Society, Brain Injury Society of Toronto, and word of mouth. Through the use of open-ended, in-person semi-structured interviews, we will gather a storied account of participants' lived experiences of caring for a child with a TBI. The use of the TBI Resiliency Model will then be used as an analytic framework to interpret caregivers' efforts with constructing and displaying meaning-related resiliency.

Summary/Implications: Given the limited appreciation of psychosocial processes that underpin rehabilitation interventions, these results will enhance clinicians' understanding of the individualized nature of positive adjustment following a loved one's TBI. Understanding the interplay of conditions, factors, and processes that influence caregivers' psychological, social, emotional, and cognitive responses to disability is necessary for clinicians to provide optimal support. Ultimately, acknowledging and understanding the effect of TBI on both the individual and their caregivers is central to family-centred practice.

Poster #31:

Do children with concussion experience neck disability? A preliminary descriptive study

Charlotte Anderson, Bloorview Research Institute; Euson Yeung, Department of Physical Therapy, University of Toronto; Nick Reed, Bloorview Research Institute.

Field of Research: Rehabilitation Health Services Studies, Practice Science

Background: Based on the anatomical proximity of the head and neck, and the typical mechanisms of injury that cause concussion, one can reason that injury to the head warrants examining the neck. To date, few studies have evaluated the degree of neck injury for children with a diagnosed concussion and presenting with post concussion symptoms (PCS). The goal of this preliminary study is to determine if neck disability is present in children with PCS.

Method: A descriptive correlational study of children (between the ages of 9 years of age and 18 years of age) experiencing post concussion symptoms was conducted. Participants completed the Neck Disability Index (NDI). Descriptive statistics and regression analysis was conducted to determine correlations and frequency accounts.

Results: The sample in this study consisted of 65 children between the ages of 9-17 years old (M= 14.29 years, SD= 2.37; female=44 [68%], male=21 [32%]). The majority of participants had no previous history of concussion (N=38, 58%). Furthermore, the majority of the participants (N= 37, 65%) reported their last concussion to be more than 90 days before participating in this study. On average, males reported a slightly higher NDI score (5.54), than females (5.43). Children between the ages of 14-17 years of age, on average, had a slightly higher NDI score (5.89) than children between 9-13 years of age (5.03). Participants who reported more than three previous concussions (N=7), had an average total NDI score of 6.58. 52% of the participants reported mild disability in their neck, as measured by the NDI.

Summary: Neck disability was found in children with a diagnosed concussion. This study acts as an initial step towards better understanding neck disability amongst children with concussion and warrants further exploration.

Poster #32:

Clinicians' understanding of the influence of sex and gender constructs on patients with TBI: a qualitative study

Sara Hanafy, Rehabilitation Sciences Institute, University of Toronto; Vanessa Amodio, Toronto Rehabilitation Institute, University Health Network; Halina (Lin) Haag, Faculty of Social Work, Wilfrid Laurier University; Heather Colquhoun, Department of Occupational Science and Occupational Therapy, University of Toronto; John Lewko, Centre for Research in Human Development, Laurentian University; Enrico Quilico, Rehabilitation Sciences Institute, University of Toronto; Richard Riopelle, Brain Injury Canada; Patrick Archambault, Department of Family Medicine and Emergency Medicine, Université Laval; Angela Colantonio, Rehabilitation Sciences Institute, University of Toronto; * Sally Lindsay, Rehabilitation Sciences Institute, University of Toronto; Tatyana Mollayeva, Toronto Rehabilitation Institute, University Health Network.

*Associated with co senior author

Field of Research: Rehabilitation Health Services Studies

Funding: CIHR grant and CIHR-SSHRC Partnership grant

Introduction: Traumatic brain injury (TBI) is a multifaceted health problem, in which sex and gender constructs can have an impact on functional outcomes and recovery trajectory. Recommendations for improving patient care include attention to biological sex and gender constructs in patient-clinician collaborations. This relies upon knowledge and understanding of these topics by clinicians, yet little is known about how clinicians perceive the effects of sex and gender constructs on recovery from TBI. Therefore, the objective of this study was to explore the experiences of clinicians at an Ontario-based facility, and their understanding of how sex and gender constructs may facilitate or hinder recovery in their patients with TBI.

Methods: Sixteen healthcare professionals (4 men and 12 women) who treat, assess, or provide rehabilitation to patients with TBI at the acute and chronic stages after injury participated in semi-structured in-depth interviews. A classic thematic analysis approach without an underlying theory in place was undertaken to analyze the data. Two researchers independently reviewed the interview transcripts prior to developing the coding framework. Future thematic analysis will involve discussion of patterns noted by each researcher, respectively.

Results: The healthcare professions of men included physical medicine and rehabilitation and clinical neuropsychology. Our sample of women included a broader range of health professions, such as occupational therapy, social work, physical therapy, speech language pathology, physical medicine and rehabilitation, and behaviour therapy. Preliminary thematic analysis highlighted three emerging themes that may facilitate or hinder recovery in TBI patients: (1) displaced gender roles of masculine and feminine origins, and post-injury identity loss; (2) differential treatment as a result of unconscious bias related to social determinants of health and circumstantial dissimilarities; and (3) roles of sex and gender are unrecognized but implicitly acknowledged as a priority in healthcare. Preliminary results of interview data will be provided for a subset of this population.

Significance: Clinical decisions are influenced by the clinicians' professional experiences as well as by their knowledge of and relationship with the patient. Therefore, this work will better our understanding of how clinicians perceive sex and gender considerations as relevant to clinical practice in a rehabilitation setting, which will inform clinical care and future training.